Castlereagh Coal

INVINCIBLE COLLIERY
ANNUAL REVIEW 2022

1 JANUARY 2022 TO 31 DECEMBER 2022

Table of Contents

Tables

Appendices

Annual Review Title Block

Name of operation:	Invincible Colliery
Name of operator:	Shoalhaven Coal Pty Limited
Development consent:	Invincible Coal Mine Extension Project Approval 07_0127 (MOD 5)
Name of holder of development consent:	Shoalhaven Coal Company Pty Limited
Mining leases:	ML1638, ML1635, CCL702, EL7517
Name of holder of mining leases:	Shoalhaven Coal Pty Limited
Water licence:	Water Access Licence (WAL) 36485 (10BL602586)
Name of holder of water licence:	Shoalhaven Coal Pty Limited
RMP start date:	30 September 2022
RMP end date:	N/A
Annual Review start date:	1 January 2022
Annual Review end date:	31 December 2022

I, Kim Nguyen, certify that this audit report is a true and accurate record of the compliance status of Invincible Colliery for the period 1 January 2022 to 31 December 2022, and that I am authorised to make this statement on behalf of Shoalhaven Coal.

Note.

a) The Annual Review is an 'environmental audit' for the purposes of section 122B(2) of the Environmental Planning and Assessment Act 1979. Section 122E provides that a person must not include false or misleading information (or provide information for inclusion in) an audit report produced to the Minister in connection with an environmental audit if the person knows that the information is false or misleading in a material respect. The maximum penalty is, in the case of a corporation, $1 million and for an individual, $250,000.

b) The Crimes Act 1900 contains other offences relating to false and misleading information: section 192G (Intention to defraud by false or misleading statement—maximum penalty 5 years imprisonment); sections 307A, 307B and 307C (False or misleading applications/information/documents—maximum penalty 2 years imprisonment or $22,000, or both).

Name of authorised reporting officer:	Kim Nguyen
Title of authorised reporting officer:	Chief Executive Officer
Signature of authorised reporting officer:	
Date:	30/04/2023

1.0 Statement of Compliance

This Annual Review provides a summary of the Invincible Colliery operations performance over the period 1 January to 31 December 2022 (referred to hereafter as the reporting period).

It is noted that during the reporting period an Independent Environmental Audit (IEA) was not undertaken. An IEA was undertaken in 2016 which identified non-compliances across EPL, Mining Lease (ML) and the Project Approval. An updated action plan is included **Appendix 3.** During the reporting period, Invincible Colliery operated in accordance with Project Approval 07_0127 – Mod 5 (Project Approval) Southern Extension Project, as approved by the Planning and Assessment Commission (PAC) on 2 February 2018. Invincible Colliery remained on care and maintenance during the reporting period whilst planning for the recommencement of operations was undertaken by Shoalhaven Coal Pty Limited (Shoalhaven Coal).

The compliance status for the reporting period is summarised in **Table 1.3**. Two (2) non-compliance occurred during the reporting period. The non-compliances recorded during the report period have been ranked according to the risk matrix included in **Table 1.2** and a brief description of each is provided in **Table 1.3**.

Table 1.1 Statement of Compliance

Relevant Approval	All conditions complied with?
Project Approval (PA) 07_1027 (Mod 5)	No – Refer to **Table 1.3**
Environment Protection Licence (EPL) 1095	Yes
WAL 36485 (10BL602586)	Yes
Mining Lease (ML) 1635, ML 1638 and Consolidated Coal Lease (CCL) 702 and Exploration Lease 7517	Yes

Table 1.2 Compliance Status Key

Risk Level	Colour Code	Description
High	**Non-compliant**	Non-compliance with potential for significant environmental consequences, regardless of the likelihood of occurrence
Medium	**Non-compliant**	Non-compliance with: • Potential for serious environmental consequences, but is unlikely to occur; or • Potential for moderate environmental consequences, but is likely to occur
Low	**Non-compliant**	Non- compliance with: • Potential for moderate environmental consequences, but is unlikely to occur; or • Potential for low environmental consequences, but is likely to occur
Administrative Non-compliance	**Non-compliant**	Only to be applied where the non-compliance does not result in any risk of environmental harm (e.g. submitting a report to government later than required under approval conditions)

Source: Annual Review Guideline (NSW Government, 2015).

Table 1.3 Non-Compliance Recorded during the Reporting Period

Relevant Approval	Condition No.	Condition Description	Compliance Status	Comment	Where Addressed in Annual Review
PA 07_0127 (MOD 5)	Schedule 3 Condition 21	Meteorological Monitoring.	**Non-compliant**	On the 4th of February 2022, monitoring technicians in attendance at Invincible Colliery were unable to download data from the site Meteorological Station. A previous download conducted in January 2022 had been successful. An investigation carried out by a qualified technical expert determined that the data logger associated with the Meteorological Station had failed, with the failure occurring between the last download on the 5th of January 2022 and the 4th of February 2022. A new logger was installed in March 2022.	**Section 6.2**
PA 07_0127 (MOD 5)	Schedule 3 Condition 19	Air Quality Monitoring – HVAS PM10 & TSP	**Non-compliant**	The HVAS unit was determined to be faulty, requiring offsite repair. It was subsequently replaced by a temporary unit on the 22nd of May 2022. During the period of non-compliance, PM10 & TSP data was unable to be determined for scheduled runs from 4 April until 22 May 2022.	**Section 6.3**

2.0 Introduction

Shoalhaven Coal Pty Ltd owns the Invincible Colliery, an open cut coal mine located approximately 25 kilometres (km) north-west of Lithgow in New South Wales (NSW) (refer to **Figure 1, Appendix 1**). Invincible Colliery is Operated by Castlereagh Coal a wholly owned subsidiary of Shoalhaven Coal Pty Ltd.

Operations at Invincible Colliery were suspended and placed in care and maintenance in April 2013 as known coal reserve within the approved mining area were exhausted and a project modification by former owners Coalpac Pty Ltd to allow further mining was rejected. As a result, administrators were appointed in October 2013, and Coalpac Pty Ltd was placed into voluntary liquidation in November 2014. Invincible Colliery and the nearby Cullen Valley Mine were subsequently purchased by Shoalhaven Coal Pty Ltd (a subsidiary of the Manildra Group) in 2015 to secure the supply of nut coal for Manildra's Shoalhaven Starches Plant located at Bomaderry on the NSW South Coast.

Subsequently Shoalhaven Coal sought a modification to the Invincible Colliery Project Approval in accordance with Section 75W of the *Environmental Planning and Assessment Act 1979*. The modification proposed an extension to open cut mining operations to the south of the existing approved mining domain into are area known as the Southern Extension. Following public exhibition between 27 September and 8 November 2016, the modification was approved by the NSW Planning and Assessment Commission (PAC) on 5 February 2018, refer to **Section 3.1**.

In November 2021 Shoalhaven Coal Pty Ltd was sold via a 100% share transaction to an all-Australian locally based ownership team who continued to operate the Colliery under a care and maintenance arrangements until the end of the reporting period.

Invincible Colliery is located in an area of historical mining operations associated with western coalfields of NSW, including the former mining operations at Cullen Valley Mine, Baal Bone Colliery, Pine Dale and Ivanhoe Colliery. The Invincible site has had a long history of mining operations commencing in 1901. Open cut mining has been carried out at Invincible Colliery at various times since the 1940s through to 2013 when operations were placed in care and maintenance. The existing operations are shown in **Figure 2, Appendix 1**.

2.1 Mine Contacts

The Manager Mining Engineering is responsible to the regulatory authorities for all aspects of environmental compliance at the site supported by the Environmental Manager and Community Liaison Officer. Contact details are summarised in **Table 2.1.**

Table 2.1 Key Personnel Responsible for Environmental Management

Name	Role	Company	Contact details
Kim Nguyen	Chief Executive Officer	Shoalhaven Coal Pty Ltd, trading as Castlereagh Coal	Invincible Colliery Castlereagh Highway Cullen Bullen, NSW 2790 M 0414 335 529
Almudena Bryce	Environmental Manager and Community Liaison Officer	Castlereagh Coal	Invincible Colliery Castlereagh Highway Cullen Bullen, NSW 2790 M | 0418 436 866

2.2 Annual Review Requirements

During the reporting period, Invincible Colliery operated in accordance with Project Approval.

Condition 4 of Schedule 5 of the Project Approval requires an Annual Review (AR) to be prepared and submitted to the DPE. This report has been prepared in accordance with *NSW Government Annual Review Guidelines* (NSW Government, 2015) and details the operational and environmental management activities of Invincible Colliery during the reporting period. Project Approval requirements along with an explanation of where each requirement is addressed within this document are provided in **Table 2.2**.

Table 2.2 Project Approval 07_0127 (MOD 5) Conditions for the Annual Review

Conditions		Addressed in
Schedule 3 – Specific Environmental Conditions Monitoring of Coal Transport		
40.	The Proponent must: a) Keep accurate records of the: • Amount of coal transported from the project in each calendar year (on a monthly basis) • Number of coal truck movements generated by the project to the Mt Piper Power Station and the Shoalhaven Starches Plant (on a daily basis) b) include these records in the Annual Review.	**Section 4.0**
Schedule 3 – Specific Environmental Conditions Waste Minimisation		
43.	(e) monitor and report on effectiveness of the waste minimisation and management measures in the Annual Review.	**Section 6.10**
Schedule 5 – Environmental Management, Monitoring, Auditing and Reporting Annual Reporting		
4.	By the end of March each year, or other timing as may be agreed by the Secretary, the Proponent must review the environmental performance of the project to the satisfaction of the Secretary. This review must:	**This document**
	(a) describe the project (including any rehabilitation) that was carried out in the past financial year, and the project that is proposed to be carried out over the next year;	**Sections 4.0, 6.0** and **8.0**
	(b) include a comprehensive review of the monitoring results and complaints records of the project over the past financial year, which includes a comparison of these results against the: • relevant statutory requirements, limits or performance measures/criteria • requirements of any plan or program required under this approval • monitoring results of previous years • relevant predictions in the EA;	**Sections 6.0** and **9.2**
	(c) identify any non-compliance over the past financial year, and describe what actions were (or are being) taken to ensure compliance.	**Sections 1.0** and **11.0**
	(d) identify any trends in the monitoring data over the life of the project;	**Sections 6.0**
	(e) identify any discrepancies between the predicted and actual impacts of the project, and analyse the potential cause of any significant discrepancies; and	**Section 6.1**
	(f) describe what measures will be implemented over the current financial year to improve the environmental performance of the project.	**Section 6.0**

Note: For the purposes of the Annual Review, Condition 4(a), 4(b), 4(c) and 4(f) have been interpreted to be the calendar year which is consistent with previous Annual Reviews prepared for Invincible Colliery and aligns with a required submission date of 31 March.

3.0 Approvals

The operations at Invincible Colliery are subject to a range of standards and performance measures. Environmental approvals, licences and leases currently held by Invincible Colliery are listed in **Table 3.1.**

3.1 Development Consent History

The Invincible Project Approval granted on 4 December 2008 which permits mining for eight years from the date of grant of the approval (i.e. to 4 December 2016). This 2008 Project Approval has subsequent modifications approved in 2009 and 2010.

During 2016, Shoalhaven Coal submitted an application to DPE to modify the Invincible Project Approval to extend the life of mining operations at Invincible Colliery and obtain approval to extend the open cut mining operations to an area immediately south of the existing operations (i.e. the Southern Extension Project). The Invincible Southern Extension Project area is located within the Ben Bullen State Forest to the east of the Castlereagh Highway (refer to **Figure 2, Appendix 1**). The Invincible Southern Extension Project was approved by the PAC on 2 February 2018. The approval of the Southern Extension Project is noted as MOD 5 on the Project Approval.

The Invincible Southern Extension Project includes:

- extending the period in which mining can continue for a period of 8 years from approval of the modification application
- extending the open cut mining area to mine down to, and including, the Lithgow Seam to the south of the existing mine in the Southern Extension Area
- maximum mining and production rates of up to 1.2 Mtpa
- product coal transport arrangements (with coal to be transported from the site by road truck to either the Shoalhaven Starches Plant or Mt Piper Power Station)
- use of existing open cut voids and former underground workings for temporary water storage
- continued use of existing Invincible Colliery infrastructure (including maintenance work, and minor upgrades and operation of the existing Invincible Coal Preparation Plant (Invincible CPP), and
- rehabilitation of the Southern Extension Area and existing disturbance areas at Invincible Colliery by reshaping mining areas to remove voids and revegetating the reshaped landform with locally endemic woodland and forest communities.

Table 3.1 Current Approvals, Licences and Leases

Approval	Date Granted	Expiry Date	Details
Project Approval (PA) 07_0127 (MOD 5)	2 Feb 2018	31 December 2025	The MOD 5 Project Approval applied through the reporting period.
Environment Protection Licence (EPL) 1095	28 Feb (anniversary date)	Renewed annually	Held by Shoalhaven Coal over the Invincible premises.
Mining Lease (ML) 1635	10 Sep 2009	10 Sep 2030	Extends to the surface and covers the existing open cut mining areas at Invincible.
Mining Lease (ML) 1638	6 Nov 2009	6 Nov 2030	Extends to the surface and covers the existing open cut mining areas at Invincible. ML 1638 extends into the northern end of the Southern Extension Area.
Consolidated Coal Lease (CCL) 702	26 Nov 1990	24 Nov 2024	Variable depth.
ML1844 - Was MLA 431	21 Feb 2023	21 Feb 2044	Surface to 15.24m
Mining Lease Application 545	(Not yet determined) Application submitted 11 October 2017	Pending determination	Mining Lease Application for determination by the Division of Resources and Geoscience.
Exploration Licence 7517	16 Apr 2010	16 April 2025	Variable depth.
WAL 35978 (10BL602584) "Washery Bore"	24 Dec 2012	23 Dec 2027	Authorises the extraction of 26 units from the NSW Murray-Darling Porous Rock Groundwater Sources Water Sharing Plan.

3.2 Approved Management Plans

The environmental management plans listed below are the approved management plans for the Invincible Colliery that applied during the reporting period.

- Environmental Management Strategy (Coalpac, 2009a)
- Environmental Monitoring Program (Coalpac, 2009b)
- Aboriginal Cultural Heritage Management Plan (Coalpac, 2009c)
- Air Quality Monitoring Plan (Coalpac, 2009d)
- Blast Monitoring & Management Plan (Coalpac, 2009e)
- Landscape Management Plan (Coalpac, 2009f)
- Mining Operations Plan (MOP)(Sedgman, 2015)
- Noise Monitoring Program (Coalpac, 2009g)
- Pollution Incident Response Management Plan (2021)
- Rehabilitation Management Plan (2022)
- Road Closure Management Plan (Coalpac, 2010)
- Water Management Plan (Coalpac, 2009h).

3.3 Management Plans Prepared for Mining Re-commencement

Prior to the re-commencement of mining, a range of environmental management plans are required to be developed in accordance with the Project Approval. During the reporting period relevant management plans

were submitted and approved by the Department of Planning, Infrastructure and Environment (DPE). Shoalhaven Coal continues to update the community of the proposed mining schedule via the Community Consultative Committee. The status of these management plans is detailed in **Table 3.2**.

Table 3.2 Status of Project Approval 07-0127 Management Plans

Management Strategy/Plan	Approval Agency	Status	Comment
Noise Management Plan	DPE	Approved	Approved 13 October 2022 - available on Castlereagh Coal website
Blast Management Plan	DPE	N/A	N/A – Blasting not proposed at this point in time
Air Quality Management Plan	DPE	Approved	Approved 17 November 2022 - available on Castlereagh Coal website
Water Management Plan	DPE	Approved	Approved 8 November 2022 - available on Castlereagh Coal website
Biodiversity Management Plan	DPE	30 January 2023	RFI received from DPE. Further consultation with BCD and response to be lodged by 5 May 2023.
Aboriginal Cultural Heritage Management Plan	DPE	Approved	Approved 31 January 2023 - available on Castlereagh Coal website
Transport Management Plan	DPE	Approved	Approved 12 September 2022 - available on Castlereagh Coal website
Rehabilitation Strategy	DPE	Approved	Approved 1 November 2022 - available on Castlereagh Coal website
Rehabilitation Management Plan	NSW RR DPE	Approved	Approved 12 December 2022 - available on Castlereagh Coal website
Pollution Incident Response Management Plan	N/A	Updated December 2022	Updated PIRMP available on Castlereagh Coal website
Environmental Management Strategy	DPE	Approved	Approved 1 November 2022 - available on Castlereagh Coal website

4.0 Operations Summary

A summary of the operations undertaken at Invincible Colliery during the reporting period are included in the following sections. It is noted that Invincible Colliery was on care and maintenance during the reporting period and therefore there were no mining operations undertaken.

4.1 Mining Operations

As discussed in **Section 3.1**, on 5 February 2018 the Invincible Colliery Southern Extension Project was approved by the PAC. This approval allows the mining down to, and including, the Lithgow Seam to the south of the existing mine in the Southern Extension Area (**Figure 2, Appendix 1**). There was no mining undertaken at Invincible Colliery during 2022. The proposed timing for the recommencement of mining at Invincible Colliery Area is yet to be confirmed by Shoalhaven Coal with the new ownership undertaking a comprehensive review of all mining and related assets. Production figures for the reporting period are detailed in **Table 4.1**.

Prior to the re-commencement of mining, a range of environmental management plans are required to be developed in accordance with the Project Approval. Most of the management plans have now been approved as detailed in **Section 3.3**. DPE will be advised of the recommencement date when the final plans are approved as required by the Project Approval.

Table 4.1 Production Summary

Material	Approved limit	Previous reporting period (actual 2021)	This reporting period (actual 2022)	Next reporting period (forecast 2023)
Waste rock/ overburden (Mbcm)	Not specified	0	0	1.3
Coal works/Coal mining (Mt)	0 – 2Mtpa handled (EPL) 0.5 - 2Mtpa produced (EPL) 1.2Mtpa extraction (PA)	0	0	0.3
Coarse reject	Not specified	0	0	0
Fine reject (tailings)	Not specified	0	0	0
Saleable Coal (Mt)	Not specified	0	0	0.3

4.2 Vehicle Movements

In accordance with Condition 40 of Schedule 3 of the Project Approval, records regarding the amount of coal transported from the mine site and annual number of coal truck movements for 2022 is required to be included within this report. As the site was in care and maintenance during the reporting period no coal was transported from Invincible Colliery during 2022.

4.3 Section 240 Notice

During 2022 activities continued to address Notice NTCE0008974 (directing an assessment of rehabilitation materials, quantities, changes in inventories and shortfall projections at completion of mining activities and a report demonstrating how the directions have been met) and Notice NTCE0008975 (directing an

assessment of surface water management systems associated with the final landform, including an assessment of the adequacy of the current systems, capacity, construction methods and effectiveness of materials used for rock armouring and a report demonstrating how the directions have been met).

Consultant specialists from Umwelt and Golder were engaged at the end of the 2021 reporting period to undertake technical investigations and provide advice on longer term recommendations to address the matters associated with the Section 240 Notices. The final report completed in May 2022 recommended a program of works to be implemented to establish long term stability of landforms. Following completion of the Umwelt/Golder report and recommended program of works, Shoalhaven Coal consulted with the NSW Resources Regulator to develop an action plan to address the recommendations. **Table 4.2** provides the recommended program of works by Umwelt/Golder and includes the proposed actions and target action dates developed by Shoalhaven Coal in consultation with the NSW Resources Regulator, and comments from the Resources Regulator following a subsequent site visit in October 2022.

Table 4.2 Recommended Program of Works – Section 240 Notices

Recommended Program of Works	Proposed Action	Target Action Date
Complete detailed monitoring, including an ecological evaluation, of established areas of final landform at both Invincible and CVM to establish current status. Biodiversity/rehabilitation/subsurface heating monitoring is an annual program (due 31/12/yearly) and can be complemented with the physical landform and structures stabilisation considerations.	Shoalhaven Coal has initiated and RFQ to an appropriately qualified consultancy capable of managing both the existing annual biodiversity program and the physical landform and structures stabilisation considerations (as part of a combined report) across both mine sites. The findings of the initial annual report and relevant actions will inform further actions in this Table. RR comments: Field work on track for November	Completion by 31 December 2022 RR comments: On target for completion
Consider sourcing high density LiDAR and develop DTM of both Invincible and CVM following completion of current mining at CVM, the Invincible Southern Extension and completion of review of future mining options at both CVM and Invincible sites.	Following completion of a review of future mining options, mining at both sites and final landform completion, Shoalhaven will source high density LiDAR and develop a high resolution DTM to enable detailed ongoing assessment of the stability of established areas of final landform. RR comments: External review just completed – Internal review of recommendations / workshop and consideration of future mining options impacting final landforms to be held November 2022. LiDAR requirements to be determined once mining options and impacts on final landforms as currently proposed are amended or finalised	Post completion of final landforms RR comments: Ongoing action to flexibly respond to outcomes of review
Develop an ongoing monitoring and assessment strategy to identify established areas of final landform at both Invincible and CVM that require intervention to achieve long term stability	Areas requiring intervention are to be identified in the initial (and ongoing) annual biodiversity and the physical landform and structures stabilisation	Completion by 31 December 2022 RR comments: On target for completion

Recommended Program of Works	Proposed Action	Target Action Date
	considerations (as part of a combined report) program across both mine sites. A strategy for regular monitoring and intervention will be an output of that report and be implemented to maintain and improve stability outcomes for each site identified. RR comments: Field work on track for November	
Develop detailed final landform designs for areas at Invincible and CVM yet to be established	This currently forms part of the rehabilitation reforms process, forward and final plans which captures both sites to the end of their current approvals in 2025. Nevertheless, with respect to the outcomes of a review of potential future mining options at both sites being undertaken by Shoalhaven Coal, it is acknowledged that final landform designs could vary. Shoalhaven Coal will amend in consultation with the Resources and Regulator and in line with existing and / or future approvals detailed final landform designs for both sites if required RR comments: Rehab reform requirements implemented. As noted above, an internal review of recommendations / workshop and consideration of future mining options impacting final landforms at both sites to be held November 2022 to determine mining options and impacts on final landforms.	Current Rehabilitation Reforms – Implement existing plans developed as part of the Rehabilitation reforms. Shoalhaven Coal will hold a better understanding of future mining options over and above those currently approved following completion of the options review 30 June 2023. Shoalhaven Coal will review and amend plans as required to capture final landform changes should they be required by 30 June 2023. RR comments: Note June 30 provides time to give consideration and implement recommendations that may result n change to existing plans. Ongoing action to flexibly respond to outcomes of review
Develop long term drainage structure designs for revised Invincible and CVM final landform designs	This action is an intrinsic part of the detailed final landform design process noted above	As above
Revise materials inventory assessment based on revised Invincible and CVM final landform designs and detailed DTM	As a result of the Umwelt / Golder report (Section 240 response) Shoalhaven Coal have a greater understanding of the requirements for supplemental / shortfall in materials which are less than previously thought when considering bulk availability across both sites. Following completion of the review of future mining options at both sites, Shoalhaven Coal will implement the following actions where required, to enable: 1. Seek suitable modifications (where required) to transport venm material between the two sites, and / or	Shoalhaven Coal will hold a better understanding of materials inventory changes following completion of the review of future mining options by 30 June 2023. RR comments: Shoalhaven Coal will review and amend plans and implement appropriate modifications where required to address final landform design volume requirements by 30 June 2023.

Recommended Program of Works	Proposed Action	Target Action Date
	2. Seek suitable modifications (where required) to import venm from offsite locations up for consideration including Walker Quarries or TfNSW tunnel projects.	

Detailed desktop and field work was undertaken by specialist consultants in late 2022 to develop long term actions meeting the requirements of the proposed actions and targets identified in the plan developed in consultation with the Resources Regulator. The actions from the physical landform and structures stabilisation investigation and report are provide in **Table 4.3**.

Table 4.3 Key Issues and Recommendations Summary - Cullen Valley Mine

Issue	Recommendation	CVM Site Reference									
		1	2	3	4	5	6	7	8	9	10
Active erosion of ESC structures (e.g. rilling, scouring erosion, excessive sediment buildup).	Schedule program of works to rectify issues to protect sites further impacts. Remedial measures may include temporary controls (fencing, mulching), reshaping of impacted areas, cover crops.	X	X	X	X	X		X		X	
Active erosion of rehabilitation batters (e.g. rilling, scouring, tunnel erosion).	Schedule program of works to rectify issues to protect sites further impacts. Remedial measures may include ripping or reshaping of impacted areas, application of suitable soil ameliorants, revegetation with target vegetation communities.	X			X					X	X
Active erosion / weathering of rock lining of rehabilitation drop structures requires remediation.	Review options to remediate issues identified in the materials used to armour drop structures, to ensure they continue to operate effectively in managing surface water flows.			X					X		
Ground cover is significantly reduced when compared to surrounding rehabilitation areas and target vegetation communities.	Review the exposed areas to identify the cause(s) of failure of revegetation in theses areas and rework to minimise erosion risks and ensure these areas can develop to meet relevant objectives and criteria. Management options may include: assessment of the nature of the rehabilitation soils and substrate, application of ameliorants prior to reseeding or direct planting; re-ripping or other mechanical treatments.						X	X			X
Sediment dam requiring remedial work (erosion of associated drainage structures, embankment, excessive sediment buildup).	Review options maintain structure to ensure dams continue to operate effectively, generally in accordance with Blue Book requirements.	X									
Monitoring required to review ESC issues that may need remediation.	Undertake follow-up monitoring in Q3 2023.	X	X	X	X	X	X	X	X	X	X

5.0 Actions Required from Previous Annual Review

Following submission of the 2021 Annual Review to DPE on 31 March 2021, DPE provided comment on the Annual Review in correspondence to Shoalhaven on 9 June 2022. DPE advised that the Annual Review was considered to generally satisfy the requirement of the Approval in relation to Annual Reviews and requested that the Annual Review be made publicly available on the company website.

6.0 Environmental Performance

The following sections provide a summary of environmental monitoring and management undertaken during the reporting period. Invincible Colliery undertakes a range of environmental monitoring. Environmental monitoring locations for the site are shown on **Figure 3, Appendix 1**. Environmental monitoring data and a copy of the current Invincible Colliery management plans are published on the Castlereagh Coal website (http://ccoal.com.au) in accordance with the requirement of the Project Approval. An overview of environmental performance at Invincible Colliery is provided in the following sections. A summary of the environmental performance during the reporting period is presented in **Table 6.1**.

6.1 Summary of Performance against EA Predictions

The Invincible Colliery has been subject to three Environmental Assessments (EA) and several modifications in the last 14 years of operations. The Invincible Expansion Project involving expanded operations to the north and south of the original mining area was assessed by the EA dated April 2008 (R.W. Corkery & Co. Pty Limited, 2008). An EA was also prepared for the Invincible Colliery Southern Extension Project (Umwelt, 2016) which assessed the expansion of operations immediately to the south of the existing operations.

As there have been no operations undertaken during the reporting period in accordance with the EA for the Invincible Southern Extension Project (Umwelt, 2016), the results of environmental monitoring obtained during the reporting period has been compared to the predictions in the EA dated April 2008 (R.W. Corkery & Co. Pty Limited, 2008) and associated modification documents dated February 2009 (R.W. Corkery & Co. Pty Limited, 2009) and June 2010 (Hansen Bailey, 2010) within this Annual Review. During the reporting period, Invincible Colliery was on care and maintenance and there were no mining activities conducted. When mining operations recommence, the Annual Review will report against the EIS predictions in the Invincible Southern Extension Project (Umwelt, 2016). Environmental monitoring undertaken during the reporting period included noise, air quality, surface and groundwater quality and biodiversity.

6.1.1 Air Quality Predictions against the EA

The EA (R.W. Corkery & Co. Pty Limited, 2008) predicted that adoption of air quality control measures including dust suppression, progressive rehabilitation and minimisation of clearing in advance of operational activities would result in annual average PM_{10} and dust deposition concentrations being below regulatory criteria. The air quality modelling completed for the EA (R.W. Corkery & Co. Pty Limited, 2008) was undertaken assuming that mining operations were being conducted. Invincible Colliery operated in a care and maintenance capacity during the reporting period and the TSP, PM_{10} and dust deposition concentrations recorded were below regulatory criteria for the reporting period. The details regarding the air quality monitoring results can be found in **Section 6.3**.

6.1.2 Water Quality Predictions against the EA

Clean surface water is diverted away from active disturbance areas and runoff from disturbed areas is collected and stored for operational uses such as dust suppression. The EA (R.W. Corkery & Co. Pty Limited, 2008) predicted that the project was unlikely to have a significant impact on local or regional surface water quantity or quality. The EA (R.W. Corkery & Co. Pty Limited, 2008) did not predict any additional water quality impacts for the modification proposals. Water quality monitoring was undertaken on eleven discharge events during the reporting period. All the results complied with the EPL water quality concentration limits. Further details on the surface water quality monitoring results are provided in **Section 6.4**.

6.1.3 Groundwater Predictions against the EA

As noted in **Section 6.5** , there have been no impacts detected on groundwater levels and water quality at Invincible Colliery.

6.1.4 Noise Predictions against the EA

The EA (R.W. Corkery & Co. Pty Limited, 2008) modelling results indicated that noise mitigation measures would result in compliance with project specific noise criteria except for a 1dB(A) exceedance during calm daytime conditions at the Billabong property. Under worst case scenario conditions, the following exceedances were predicted:

- 2dB(A) at Hillview property
- between 4dB(A) and 7dB(A) at Billabong property
- 1dB(A) at Cullen Bullen west
- between 2dB(A) and 4dB(A) at Cullen Bullen south property.

As detailed in **Section 6.6** , noise monitoring has shown that noise emissions have been inaudible at all locations since the mine was placed on care and maintenance in 2013.

Table 6.1 Summary of Environmental Performance during the Reporting Period

Aspect	Approval Criteria/ EIS Prediction	Performance during the reporting period	Trend/key management implications	Implemented/proposed management actions
Air Quality (Refer to Section 6.3)	Refer **Section 6.3.2**/ Refer **Section 6.1.1**	Annual average deposited dust, PM_{10} and TSP levels were below the respective performance criteria.	Refer to **Section 6.3.4** Recorded air quality levels are generally consistent with previous years when Invincible has been on care and maintenance.	No further action required.
Surface Water Quality (Refer to Section 6.4)	Refer **Section 6.4.2** / Refer **Section 6.1.2**	Water quality across the Invincible Colliery water monitoring network was generally compliant with respective concentration limits.	Refer to **Section 6.4.4** Water quality is generally consistent with previous years when Invincible has been on care and maintenance.	No further action required.
Groundwater (Refer to Section 6.5)	Refer **Section 6.5.2** / Refer **Section 6.1.3**	Compliant	Groundwater quality monitoring results are further discussed in **Section 6.5.4**	No further action required.
Noise (Refer to Section 6.6)	Refer to **Section 6.6.2** / Refer to **Section 6.1.4**	Compliant	Refer to **Section 6.6.4** Noise emissions were inaudible at all private residences during the reporting period, which is consistent with monitoring undertaken during care and maintenance.	No further action required.
Biodiversity (Refer to Section 6.7)	Refer to **Section** Error! Reference source not found./ Refer to **Section 8.3**	Compliant	Refer to **Section** Error! Reference source not found.	Biodiversity monitoring program will continue in accordance with regulatory requirements.

6.2 Meteorological Monitoring

The Invincible Colliery weather station (IMET1) is located within the Lot 113 biodiversity offset area as shown in **Appendix 1, Figure 2.** Data was unable to be retrieved for January and February 2022 due to logger failure. The logger was replaced and began recording data from March 2022. A summary of monthly meteorological monitoring is provided in **Table 6.2**.

6.2.1 Rainfall

Invincible Colliery received 622.0 mm of rainfall over 138 rain days during the reporting period. The highest rainfall occurred during October (135.8 mm), while the lowest rainfall was recorded during June (11.4 mm). A summary of monthly rainfall data is provided in **Table 6.2**.

6.2.2 Temperature

Air temperature is measured at 2 and 10 metres above ground level at Invincible Colliery. The maximum temperature recorded during the reporting period was in December (30.3 @ 2 m, 29.9 @10 m) and the lowest temperature occurred in July (-5.3 @ 2 m, -4.7 @10 m). Maximum and minimum monthly temperatures are summarised in **Table 6.2**.

6.2.3 Humidity

The IMET1 humidity sensor was faulty during the reporting period and no valid data is available.

6.3 Air Quality

6.3.1 Environmental Management Measures

There were no mining activities undertaken during the reporting period. On-site activities were limited to inspections conducted for care and maintenance of the mine site and environmental monitoring. As such, impacts to air quality were minimal. Air quality monitoring is undertaken in accordance with the Air Quality Monitoring Program (AQMP) (Coalpac, 2009d) and subsequently the Invincible Colliery Air Quality Management Plan (AQMP 2022) which was approved on 17 November 2022. The air quality monitoring network consists of five dust deposition gauges and one High Volume Air Sampler (HVAS) which measures particulate matter <10 µm (PM_{10}) (refer to **Figure 3, Appendix 2**).

Air quality impacts at Invincible Colliery are managed in a manner that minimises generation of airborne and visual dust.

6.3.2 Performance Criteria

Shoalhaven Coal is required to ensure that dust and particulate emissions do not cause exceedances of the criteria specified by the Project Approval. The air quality impact assessment criteria specified in the Project Approval are provided in **Table 6.3**.

Table 6.2 Invincible Colliery Weather Data

Month	Rainfall (mm)	Cumulative Rainfall (mm)	No. of rain days/month	Air temp @ 2m (°C)		Air temp @ 10m (°C)		Humidity (%)	
				Minimum	Maximum	Minimum	Maximum	Minimum	Maximum
January 2022	NA	NA	NA	NA	NA	NA	NA	NA	NA
February 2022	NA	NA	NA	NA	NA	NA	NA	NA	NA
March 2022	31.6	31.6	9	5.4	25.9	5.8	25.5	30.3	129.9
April 2022	62.6	94.2	11	3.6	22.8	4.2	23.3	29.2	134.0
May 2022	61	155.2	18	-0.7	21.0	0.0	21.3	35.6	137.5
June 2022	11.4	166.6	10	-4.6	13.9	-4.1	14.1	39.1	135.9
July 2022	74.2	240.8	18	-5.307	14.28	-4.747	14.08	12.97	137
August 2022	71.8	312.6	16	-2.953	16.82	-2.462	16.96	25.45	141.7
September 2022	96.8	409.4	16	-1.461	17.66	-1.012	17.92	10.98	143.1
October 2022	135.8	545.2	18	0.872	22.35	1.089	19.77	25.65	147.5
November 2022	56.6	601.8	13	0.587	25.25	1.099	25.45	24.76	151.7
December 2022	20.2	622	9	1.574	30.32	2.108	29.91	13.86	146.6
Total	**622.0**	-	**138**	-	-	-	-	-	-

NA = Weather Station Failure – no data available

Table 6.3 Air Quality Performance Criteria

Pollutant	Averaging Period	Criterion
Total suspended matter (TSP) matter	Annual average	90 µg/m^3
Particulate matter <10µm (PM_{10})	Annual average	30 µg/m^3
	24 hour average	50 µg/m^3
Deposited dust	Annual average (maximum total)	4 g/m^2/month
	Annual average (maximum increase)	2 g/m2/month

6.3.3 Environmental Outcomes

6.3.3.1 Dust Deposition

Deposited dust is monitored every 30 ±2 days at five representative locations around the mine site (dust deposition gauges IDD1 to IDD5) (refer to **Figure 3, Appendix 1**). The annual average criterion for deposited dust (4 g/m^2/month) was not exceeded at any of the dust deposition gauges during the reporting period. The 2022 annual average dust levels for all locations were less than 2 g/m^2/month and therefore complied with air quality performance criteria. The monthly deposited dust monitoring results and annual averages for 2022 are shown in **Table 6.4** and is compared with historical results in **Appendix 2, Figure 2.**

Table 6.4 Deposited Dust Monitoring Results

Date	Total Insoluble Solids (g/m^2/month)				
	IDD1	IDD2	IDD3	IDD4	IDD5
January 2022	0.2	0.1	0.1	0.2	0.2
February 2022	0.5	0.5	0.5	0.3	0.3
March 2022	0.6	0.5	0.4	0.5	0.3
April 2022	0.2	0.4	0.4	0.3	0.3
May 2022	0.3	0.3	0.4	0.5	0.5
June 2022	0.2	0.5	0.3	0.3	0.1
July 2022	0.5	1.4	0.5	0.1	0.2
August 2022	0.3	0.4	0.2	0.3	0.1
September 2022	0.6	0.7	0.6	0.8	0.6
October 2022	0.6	1.9	0.5	0.3	0.3
November 2022	0.4	0.5	0.1	0.3	0.5
December 2022	0.6	1.3	0.5	0.4	0.3
Annual Average 2022	**0.4**	**0.7**	**0.4**	**0.3**	**0.3**

6.3.3.2 Particulate Matter

Monitoring of particulate matter was conducted during 2022. Total suspended particulates are estimated from the PM_{10} concentrations. The annual average criteria for PM_{10} (30 µg/m^3) and TSP (90 µg/m^3) were not exceeded during the reporting period. The annual average PM_{10} monitoring results for the reporting period re shown in **Table 6.5**.

Table 6.5 Particulate Matter (PM10) and Total Suspended Particulates (TSP) Annual Average Results

Averaging period	PM_{10} (µg/m³)	TSP (µg/m³)*
Annual Average 2022	4.7	11.9
Annual Average Criterion	30	90

**Total suspended particulates are estimated from the PM_{10} concentrations.*

A graph of the PM_{10} and TSP monitoring data for 2022, as well as historical data trends, is shown in **Appendix 2, Figures 3 & 4**.

6.3.4 Trends in Data

6.3.4.1 Dust Deposition

Error! Reference source not found. **6.6** presents the annual average deposited dust levels over the previous five years. The 2022 annual average deposited dust levels are within the range of results recorded in the previous five years at all sites. The 2022 annual average dust deposition levels for all sites are well below the performance criteria (4 g/m²/month).

Graphs of the long-term deposited dust levels are included in **Appendix 2**.

Table 6.6 Annual Averages for Dust Deposition 2017 – 2022

Reporting period	Total Insoluble Solids (g/m²/month)				
	IDD1	IDD2	IDD3	IDD4	IDD5
Criteria	**4**	**4**	**4**	**4**	**4**
2017	1.3	0.9	0.6	0.7	0.6
2018	1.0	0.9	1.2	1.4	1.5
2019	1.1	1.0	1.8	1.1	1.5
2020	1.4	0.6	0.8	0.7	0.6
2021	0.3	0.4	0.5	0.5	0.2
2022	0.4	0.7	0.4	0.3	0.3

The 2022 annual average deposited dust levels at all monitoring locations are low and consistent with the historical range of results obtained over the previous five years.

6.3.4.2 Particulate Matter

Table 6.7 presents the PM_{10} annual average over the previous five years. The 2022 annual averages for both PM_{10} and TSP recorded at Invincible Colliery are within the range of results over the previous five years.

Table 6.7 Annual Averages for Particulate Matter 2017 – 2022

Annual Average	PM_{10} (µg/m³)	TSP (µg/m³)*
2017	7.8	19.5
2018	8.8	22.1
2019	19.2	48.1
2020	11.1	27.8

Annual Average	PM_{10} (µg/m³)	TSP (µg/m³)*
2021	5.4	13.6
2022	4.7	11.9

**Total suspended particulates are estimated from the PM_{10} concentrations.*

6.3.5 Proposed Improvements

Monitoring of air quality will continue to be conducted during 2023 in accordance with the Air Quality Management Plan (AQMP).

6.4 Surface Water

6.4.1 Environmental Management Measures

The surface water management system at Invincible Colliery utilises a series of settlement ponds and storage dams within the site. These ponds and dams are managed in accordance with the Water Management Plan (WMP) (Castlereagh Coal, 2022) and are further described in **Section 7.0**. Water is discharged as required from the main colliery dam via LD002.

6.4.2 Performance Criteria

Shoalhaven Coal is required to manage water discharged from the site so that it does not exceed the pollutant concentration limits specified by the Project Approval and EPL. The concentration limits specified in the EPL are provided in Error! Reference source not found. with the surface water monitoring results discussed in **Section 6.4.3**.

Table 6.8 Water Quality Concentration Limits

Pollutant	Concentration limit
Oil and Grease	10 mg/L
pH	6.5 – 8.5
Total suspended solids (TSS)	30 mg/L

6.4.3 Environmental Outcomes

Surface water monitoring for water quality is conducted monthly during discharge events at the licenced discharge point (LD002) in accordance with the requirements of EPL 1095. Monthly due diligence monitoring is also conducted within the Main Dam (LD002), Environmental Dam (SW01) and Silt Dam (SW02). Water quality is also monitored on a monthly basis for due diligence purposes at two locations within Cullen Creek (BSW01) and Dulhunty's Creek (BSW02). BSW01 is located upstream of Invincible Colliery and BSW02 located downstream of Invincible Colliery.

The water quality monitoring results from LD002 are included in **Table 6.9.** Eleven discharge events occurred throughout the reporting period. Samples were collected at Main Dam for due diligence purposes when no discharge was occurring at LD002. Background water quality sampling has also been undertaken at the Environmental Dam (SW01), Silt Dam (SW02), Cullen Creek (BSW01) and Dulhunty's Creek (BSW02). The results of which are included in **Appendix 2.**

A comparison of the background water quality (annual average) results during the reporting period is included in **Section 6.4.4**.

Table 6.9 LD002 Water Quality Monitoring Results

Sampling date	pH	TSS	Oil and grease
LD002 (licensed discharge point)			
Criteria	**6.5 – 8.5**	**30**	**10**
5/01/2022*	7.8	<5	<5
22/02/2022*	7.1	6	<5
7/03/2022*	7.1	15	<5
4/04/2022*	7.1	<5	<5
26/05/2022*	7.5	<5	<5
20/06/2022*	7.1	6	<5
12/07/2022*	7.9	17	<5
8/08/2022*	7.5	14	<5
7/09/2022*	7.5	10	<5
12/10/2022*	7.1	11	<5
9/11/2022*	8.2	<5	<5
6/12/2022**	7.7	6	<5

* Water discharge event

**monthly sampling is undertaken at Main Dam for due diligence purposes when no discharge is occurring

6.4.4 Trends in Data

During the reporting period, discharge was occurring on eleven of the twelve monthly sampling events as shown in Error! Reference source not found. **6.9**. All water quality monitoring results obtained during discharge events at LD002 complied with the EPL water quality concentration limits.

6.4.4.1 Background Water Quality Monitoring Results – Dams

Annual average of the background water quality in the on-site dams during 2022 together with monitoring results from previous years is presented in **Table 6.10**. LD002 discharge and the due diligence water quality results between 2011 and 2022 for pH, oil and grease and TSS is displayed graphically in **Appendix 2**.

The 2022 annual average pH recorded at LD001 (Main Dam) (7.5) was slightly higher than the average pH of 2021 (6.94) and similar to the annual averages of 2020 (7.39) 2019 (7.50), 2018 (7.50) and 2017 (7.47). The 2022 annual average pH recorded at the Environmental Dam (3.1) was similar to 2021 (3.0) and less than the 2018 annual average (5.55), and is consistent with the range of annual averages since 2016. The 2022 annual average pH recorded at the Silt Dam (7.4) was within the historical range of annual averages (6.75 to 7.47) for the Silt Dam.

The oil and grease results at the Main, Environmental and Silt Dams for 2022 were below detection limits, which is consistent with the results for 2016 to 2021.

TSS annual average results at the Main, Environmental and Silt Dams for 2022 ranged between <5 and 14 mg/L. The 2022 results for the Main Dam, Environmental Dam and Silt Dam were within the historical range of results.

Table 6.10 Comparison of Water Quality in On-Site Dams 2017-2022

Annual Average Period	Location	pH	TSS	TSS
Criteria		**6.5 – 8.5**	**30**	**10**
2017	Main Dam	7.47	10 mg/L	<5 mg/L
	Environmental Dam	3.49	25 mg/L	<5 mg/L
	Silt Dam	7.02	16 mg/L	<5 mg/L
2018	Main Dam	7.50	6 mg/L	<5 mg/L
	Environmental Dam	5.55	16 mg/L	<5 mg/L
	Silt Dam	7.43	23 mg/L	<5 mg/L
2019	Main Dam	7.50	11 mg/L	<5 mg/L
	Environmental Dam	3.57	17 mg/L	<5 mg/L
	Silt Dam	7.47	38 mg/L	<5 mg/L
2020	Main Dam	7.39	7 mg/L	<5 mg/L
	Environmental Dam	3.18	16 mg/L	<5 mg/L
	Silt Dam	7.32	62 mg/L	<5 mg/L
2021	Main Dam	6.94	6 mg/L	<5 mg/L
	Environmental Dam	3.00	12 mg/L	<5 mg/L
	Silt Dam	7.07	38 mg/L	<5 mg/L
2022	Main Dam	7.5	9 mg/L	<5 mg/L
	Environmental Dam	3.1	7 mg/L	<5 mg/L
	Silt Dam	7.4	11 mg/L	<5 mg/L

6.4.4.2 Background Water Quality Monitoring Results – Creeks

The 2022 annual average water quality at Cullen Creek (BSW01) which is upstream of Invincible Colliery and Dulhunty's Creek (BSW02) which is downstream of Invincible Colliery, together with the annual average results for the previous 5 years is present in **Table 6.11**. BSW02 was sampled in January 2022 then unable to be accessed from February 2022 onwards due to the erection of a barbed wire fence.

The 2022 annual average pH recorded at the upstream location of BSW01 (6.9) was similar to the 2021 annual average (6.54) and was similar to the historical range of annual averages (6.45 to 6.8). The 2022 annual average pH recorded (based on limited data) downstream at BSW02 (7.6) was in line with historical results.

The annual average oil and grease concentrations at BSW01 and BSW02 have been below laboratory detection limits during every year sampled, with the exception being BSW01 for 2018, and BSW02 for 2017.

The 2022 annual average TSS concentration recorded at BSW01 (19 mg/L) and BSW02 (<5 mg/L) were comparable to results from the 2016 to 2022 period.

Table 6.11 Upstream and Downstream Creek Water Quality 2017 – 2022

Annual Average	Location	pH	Oil & grease	TSS
2017	BSW01	6.46	<5 mg/L	23 mg/L
	BSW02	7.78	6 mg/L	7 mg/L
2018	BSW01	6.57	5 mg/L	33 mg/L
	BSW02	7.92	<5 mg/L	8 mg/L
2019	BSW01	6.76	<5 mg/L	90 mg/L
	BSW02	7.94	<5 mg/L	8 mg/L
2020	BSW01	6.79	<5 mg/L	21 mg/L
	BSW02	7.28	<5 mg/L	29.8 mg/L
2021	BSW01	6.54	<5 mg/L	30 mg/L
	BSW02	6.98	<5 mg/L	8 mg/L
2022	BSW01	6.54	<5 mg/L	30 mg/L
	BSW02*	6.98	<5 mg/L	8 mg/L

*Results for BWS02 based on one sample event due to access issues

6.4.5 Proposed Improvements

Monitoring of water quality at Invincible Colliery will continue to be conducted during care and maintenance.

6.5 Groundwater

Shoalhaven Coal operates a network of groundwater monitoring bores which extends across the Cullen Valley Mine and the Invincible Colliery. In accordance with the approved WMP for Invincible, only the groundwater monitoring bore of LD001 relates to the Invincible Colliery. Historically the groundwater monitoring results have been reported within the Invincible Colliery Annual Review for groundwater monitoring undertaken across the Invincible Colliery and Cullen Valley Mine. From the 2019 Annual Review and moving forward, the groundwater monitoring data provided is for LD001 only. The Cullen Valley Mine Annual Review includes the results of the groundwater monitoring which is conducted across both mining complexes as this data is relevant to Cullen Valley Mine. Monitoring of LD001 increased from biannual to monthly in September 2022 in line with the new approved WMP (Castlereagh Coal, 2022b).

6.5.1 Environmental Management Measures

The Invincible mining operation is located on the western escarpment of the Sydney Basin and groundwater intercepted in the monitoring bores is typically greater than 70 m below the surface. Water management will continue to be undertaken in accordance with the approved Water Management Plan (refer to **Section 6.1**)

6.5.2 Performance Criteria

There are no pollutant concentration limits for groundwater specified in EPL. There are also no trigger levels detailed in the currently approved Invincible Colliery Water Management Plan (Coalpac, 2009h).

6.5.3 Trends in Data

The long-term trends for LD001 in standing water level, electrical conductivity, hardness, sulphate, nitrate and metals are discussed below. Long term graphs and tables for these groundwater parameters can be found in **Appendix 2**.

6.5.3.1 Standing Water Level

Since 2012 the standing water level in LD001 has steadily increased from 884.81 to 890.88 in 2017. The 2019 measurement of 889.14 was below the 2017 maximum and above the 2012 low. Results for 2022 show standing water level to have remained steady at an average of 892.4 as shown graphically in **Appendix 2**.

6.5.3.2 pH

Between 2011 and 2021 the pH level ranges between 4.90 and 7.67. The 2022 average pH measurement of 7.1 is consistent with the average pH over the 2011 to 2021 period (refer to **Appendix 2, Figure 9**).

6.5.3.3 EC

The conductivity level between 2011 and 2021 ranges between 120 µS/cm and 330 µS/cm. The 2022 average EC result of 207µS/cm was consistent with historical results (refer to **Appendix 2, Figure 10**).

6.5.3.4 Hardness

Between 2011 and 2022 hardness has ranged between 35 mg $CaCO_3$/L and 123 mg $CaCO_3$/L. Between 2013 and 2017 the hardness results show a linear increase (refer to **Appendix 2, Figure 11**), decreasing in 2018 to 49 mg $CaCO_3$/L. The 2022 hardness results were consistent with the historical range of results.

6.5.3.5 Sulphate

Since 2011 the sulphate level declined from a maximum of 25 mg/L to 13 mg/L in 2016, with a minimum of 11 mg/L occurring in 2013. Since 2013, the sulphate results show little variation, ranging between 9 and 15 mg/L (refer to **Appendix 2, Figure 12**). The 2022 average sulphate levels of 10.5 mg/L concurs with the historical average.

6.5.3.6 Nitrate

Between 2011 and 2018 nitrate levels have ranged from non-detectable (i.e. <0.01) to a maximum of 0.26mg/L (refer to **Appendix 2, Figure 13**). The September 2022 nitrate level of 1.92 mg/L is outside the historical range. Nitrate levels returned to the low levels consistent with historical for the October to December 2022 sampling rounds.

6.5.3.7 Metals

Dissolved metals have been monitored at LD001 since 2013. For 2022 all parameters mostly returned results which were below the limit of detection with a few exceptions. Levels for all dissolved metals were within the range of previous results.

6.5.4 Proposed Improvements

Shoalhaven will continue groundwater monitoring on a monthly basis during 2023.

6.6 Noise

6.6.1 Environmental Management Measures

A Noise Monitoring Program (NMP) (Coalpac, 2009g) has been prepared in accordance with the Project Approval outlining the required frequency of monitoring during mining operations. There were no mining

operations during the reporting period, however, quarterly attended monitoring was conducted at three locations (N01, N02 and N03) (refer to **Figure 3, Appendix 1**).

6.6.2 Performance Criteria

Noise impact assessment criteria for monitoring are specified in the EPL and Project Approval as outlined in Error! Reference source not found. **6.12** and **Table 6.13**. As a result of the approval of PA07_0127 (MOD 5) in February 2018, there are currently inconsistencies in noise criteria specified in the EPL and Project Approval. This will be addressed through the EPL licence Variation process to be undertaken prior to the recommencement of mining operations.

Table 6.12 EPL Noise Impact Assessment Criteria

Location	Day time limit dB(A) LAeq (15 minute)	Evening Limit	Night time limit
At any residence on privately owned land (except Billabong and Hillview properties)	40	35 dB(A) L_{Aeq} (15 minute)	35 dB(A) L_{Aeq} (15 minute)

Note: The Billabong and Hillview properties were purchased by Coalpac in 2010.

Table 6.13 Noise Impact Assessment Criteria PA 07_0127 (MOD 5)

Location	Day time limit L_{Aeq}(15 minute)	Evening limit L_{Aeq}(15 minute)	Night time limit L_{Aeq}(15 minute)	Location L_{A1}(1 minute)
393 (Billabong)	40	40	35	45
394 (Hillview)	43	43	35	45
All other privately owned land	35	35	35	45

Note: The Billabong and Hillview properties were purchased by Coalpac in 2010.

6.6.3 Environmental Outcomes

There were no exceedances of the noise performance the reporting period as shown in **Table 6.14**. On all monitoring occasions, the noise from Invincible Colliery was inaudible.

Table 6.14 2022 Quarterly Attended Noise Monitoring Results

Location	Criterion (dB)	Quarter 1 ($L_{Aeq\ 15min}$)	Quarter 2 ($L_{Aeq\ 15min}$)	Quarter 3 ($L_{Aeq\ 15min}$)	Quarter 4 ($L_{Aeq\ 15min}$)
Cullen Bullen Central (N01)	40	IA	IA	IA	IA
Cullen Bullen West (N02)	40	IA	IA	IA	IA
Cullen Bullen South (N03)	40	IA	IA	IA	IA

IA – noise from the mine was inaudible

6.6.4 Trends in Data

The results of noise performance monitoring for the period 2011 – 2022 are summarised in **Appendix 2**. Results for quarterly noise monitoring during 2013 to 2022 has shown the site contribution to be generally inaudible at all monitoring locations.

6.6.5 Proposed Improvements

There were no noise complaints or non-compliances with noise criteria during the reporting period. Current management measures will continue to be undertaken for care and maintenance activities. Noise monitoring will continue to be undertaken quarterly during the care and maintenance phase and when mining recommences.

6.7 Biodiversity

6.7.1 Environmental Management Measures

Biodiversity monitoring commenced at Invincible Colliery in 2011. The 2022 Biodiversity Monitoring of the Rehabilitation and Biodiversity Offset Areas was undertaken in accordance with the approved Landscape Management Plan (LMP) (Coalpac, 2009f).

6.7.2 Monitoring

In 2022 biodiversity monitoring was undertaken for the Invincible Colliery Biodiversity Offset Area (BOA) and Rehabilitation Areas (refer to **Appendix 1, Figure 4** for monitoring locations). The Biodiversity Monitoring Program is based on the monitoring requirements documented in the LMP.

Monitoring of BOA and rehabilitation areas in 2022 included the following:

- Floristic monitoring within fixed plots (20m x 10m) every 10 ha to record floristic diversity and vegetation condition.
- Fauna surveys to record the fauna species diversity and habitat quality.
- Targeted searches for Clandulla geebung and Capertee stringybark (only in BOA).
- An assessment against the performance/completion criteria and checklists of the management plans and current MOP (Sedgman, 2015) for the site.

An assessment of the monitoring results against the relevant biodiversity and rehabilitation performance and completion criteria for Invincible Colliery is detailed in **Table 8.2**.

6.7.2.1 Environmental Outcomes/Trends in Data

Biodiversity Offset Areas Flora Observations

Based on the gathered floristic data and assessments on habitat state, individual site profiles have been built. For the purposes of this study, vegetation descriptions for each biodiversity offset area have been combined. These monitoring plots and vegetation communities are as follows:

- Cox's Permian red Stringy Bark – Brittle Gum Woodlands (MU37)
- Tableland Gully Scribbly Gum – Narrow-leafed Shrubby Open Forest (MU32)
- Tableland Gully Snow Gum – Ribbon Gum Grassy Forest (MU11)
- Tableland Gully Mountain Gum – Broad-leafed Peppermint Grassy Forest (MU35)
- Exotic Grassland.

The results of the 2022 floristic monitoring are provided in full in Appendix 1 of the 2022 Biodiversity Monitoring Report (TBE, 2023). A summary is provided below:

Monitoring studies of the grassland habitat in the BO Area in 2022 monitoring revealed no change in the health of the ecosystem. Where grassland areas are found on lower slopes and floodplain areas, the habitat has stayed consistent with past monitoring events. Large regions of grassy ground plants are interspersed with smaller sections of leaf litter and bare earth in these areas.

Monitoring surveys of the woodland environment in the BO2 Area in 2022 revealed no changes to habitat health. The habitat, which consists of wooded regions on low- to medium-slope slopes, has stayed comparable with past monitoring events. These places have little ground vegetation and are frequently visited by areas where leaf litter is collecting. The amount of fallen timber and leaf litter contributes to the stability of the habitat and reduces the effects of sheet erosion.

In 2022, monitoring surveys of the grassland habitat in the BO6 Area revealed no changes in the health of the environment. Where grassland areas are found on lower slopes and floodplain areas, the habitat has stayed consistent with past monitoring events. Large regions of grassy ground plants are interspersed with smaller sections of leaf litter and bare earth in these areas. No fallen logs or rocky habitat was recorded within BO6 during 2022 floristic survey.

Monitoring studies of the woodland habitat within BO3, BO4, BO5 and BO10.in 2022 revealed no change in habitat health. The habitat, which consists of wooded regions on low- to medium-slope slopes, has stayed comparable with past monitoring events.

Sparse ground vegetation and accumulated leaf litter characterise these locations. The amount of fallen timber and leaf litter contributes to the stability of the habitat and reduces the effects of sheet erosion. Exposed rock was found in sporadic places throughout larger wooded habitat zones.

The habitat, which consists of wooded regions on low- to medium-slope slopes, has stayed comparable with past monitoring events. Sparse ground vegetation and accumulated leaf litter characterise these locations.

The amount of fallen timber and leaf litter contributes to the stability of the habitat and reduces the effects of sheet erosion. BO11 was found to contain exposed rock was found in sporadic spots throughout larger wooded habitats.

Biodiversity Offset Areas Fauna Observation

The 2022 monitoring recorded an increase in overall fauna species diversity throughout the Compensatory Habitat Areas with a total of 82 recorded species compared to 46 fauna species recorded during 2021 monitoring. The 2022 monitoring event showed significant increase in species diversity from the 2020 monitoring event which recorded 68 species.

52% of the fauna diversity is represented by birds with 43 species recorded across all Invincible biodiversity offset area monitoring sites. The remaining 39 fauna species recorded during 2022 monitoring consisting of 23 mammal species, five frog species and three reptile species were detected during the 2022-23 monitoring.

Five (5) feral pest fauna species were recorded within the Invincible biodiversity offset area monitoring sites during 2022 survey. These species include: Wild Dog, European Fox, Feral Cat, Brown Hare and European Rabbit.

Rehabilitation Areas Flora Observations

Site profiles that are specified for each plot have been built using information from the floristic data acquired in 2022. For the purposes of this report, descriptions of the habitat and vegetation have been combined for each rehabilitation area. Four monitoring plots are spread out over three year-specific recovery zones in the Invincible Rehabilitation Area:

- 2008 – plot R12
- 2009 – plot R14
- 2011 – R11 and R15
- 2012 – R10 and R18

Vegetation cover at R12 and R14 was found to be adequate during the 2022 surveys concurring with previous years observations. Blackberry control intervention at R14 is recommended. R11 and R15 were noted as having adequate vegetation cover and no erosion occurring at R11 with no further planting required. R15 requires intervention to control erosion.

Vegetation of the 2012 rehabilitation area is represented by two plots (R10 and R18). The rehabilitation area surrounding monitoring site R10 was seeded in 2012 while the area around R18 was shaped with topsoil dumps. As such the vegetation formation and density differs between the sites. Vegetation at monitoring site R10 is well established with a dense midstory of shrubs and eucalypts beginning to emerge and a diverse ground layer. Monitoring site R18 is continuing to establish in throughout patches of low-density ground and midstory vegetation.

Habitat Condition

Habitat health and function of the Invincible Rehabilitation Area has overall remained consistent with previous monitoring events.

Rehabilitation within the Invincible monitoring area is considered to be successful across the three rehabilitation years (2008, 2009 and 2011). Methods of rehabilitation work for Invincible were similar to those undertaken around the same time at Cullen Valley, where the primary aim for rehabilitation works was to create a stable soil structure to reduce effects of erosion. Invincible rehabilitation areas depict improved seeding mixes and seeding rates along with the introduction of organic material compared to early rehabilitation works at Cullen Valley.

Woody debris and large timber logs were recorded frequently but in low densities across the rehabilitation area. These features aid habitat stability by forming sediment traps and increase ground cover to reduce effects of erosion. The dispersal of organic matter such as woody debris was observed to coincide with increased insect activity and the production of detritus to improve soil structures.

Rehabilitation Areas Fauna Observation

The 2023 monitoring recorded an increase in overall fauna species diversity throughout the Invincible rehabilitation areas with a total of 69 recorded species compared to 41 fauna species recorded during 2021 monitoring. The 2022 monitoring event also showed an increase in species diversity from the 2020 monitoring event which recorded 58 species.

50% of the fauna diversity is represented by birds with 35 species recorded across the Invincible rehabilitation area monitoring sites. The remaining 34 fauna species recorded during 2023 monitoring consisting of 22 mammal species, nine frog species and two reptile species were detected during the 2022-23 monitoring.

Three (3) feral pest fauna species were recorded within the Invincible rehabilitation area monitoring sites during 2022 survey. These species include Wild Dog, Brown Hare and European Rabbit.

6.7.2.2 Nest Box Monitoring

A total of 12 nest boxes located within the Invincible rehabilitation areas were inspected during the 2023 survey. Nest box 2 was found to contain five Squirrel Gliders (Petaurus norfolcensis) and nest box 3 was found to contain four (4) Squirrel Glider gliders.

Nest boxes 1-5 & 7-12 demonstrated signs of use, containing nesting material, attributed to birds and glider nests. Nest box 6 contained no fauna or signs.

Nest box 6 had fallen from the mounted pole. Nest boxes 1 & 4 were found to have lids that were worn and separating at the hinges while the lid of nest box 5 had been completely removed. All other nest boxes located within the Invincible rehabilitation areas were observed to be in good condition.

6.7.2.3 Clandulla Geebung Monitoring

Targeted searches for Clandulla geebung (*Persoonia marginata*) and Capertee stringybark (*Eucalyptus cannonii*) was undertaken within the BOA. No new locations of either species were identified.

6.7.3 Proposed Improvements

Biodiversity Monitoring and management of the Rehabilitation and Biodiversity Offset Areas will continue to be conducted during 2023 in accordance with the approved Landscape Management Plan (LMP) (Coalpac, 2009f).

6.8 Blasting

No mining operations were undertaken and no blasting was conducted during the reporting period.

6.9 Waste Management

As no mining activities were undertaken during the reporting period, minimal quantities of waste materials were required to be stored on site. Sewage from the workshops/administration areas is directed to septic systems which are pumped out by a licensed waste collection and disposal contractor on an as-needs basis.

Waste oils and grease stored at the maintenance workshop are collected by a licensed waste recycling contractor on an as needs basis. All paper and general wastes from administration and workshop areas is disposed of in garbage bins located adjacent to the administration buildings. The bins are collected as required and the contents placed in large waste skip bins positioned adjacent to the heavy vehicle maintenance building to await removal by a licensed industrial waste collector. Industrial waste collection is undertaken as required.

6.10 Hazardous Material Management

The volume of hazardous materials delivered to and stored within the site are low as there were no mining operations conducted during the reporting period. Hazardous material storage tanks containing oils, grease and degreasers have been emptied, isolated and secured. Any additional storage tanks have been removed from the site. Storage tanks remaining on site that contain these materials are kept emptied during the care and maintenance period. One of the above ground self-bunded diesel tanks (75,000L Transtank) is operational (i.e. in use). A second Transtank (95,000L) is kept on site but is currently not in use.

Diesel is delivered to site as required. In addition, waste oil and grease are stored adjacent to the workshop in a bunded area which is removed as required by a licensed contractor.

6.11 Heritage

6.11.1 Indigenous Heritage

Several artefact scatters, open camp sites and an isolated find were located during an archaeological field survey conducted in 2010. Only one of these sites (Invincible OS1 artefact scatter) was determined to have high archaeological significance.

An Aboriginal Heritage Management Plan (AHMP) (Coalpac, 2009c) has been prepared and implemented in accordance with the Project Approval (Mod 3) and in consultation with the then Department of Environment and Climate Change and the Aboriginal community. The artefact scatter site OS1 is located outside the mine disturbance area and has been fenced and signposted in accordance with the AHMP. No disturbance of OS1 occurred during the reporting period. A new Aboriginal Cultural Heritage Management Plan (ACHMP) (OzArk, 2022) was approved on 31 January 2023.

6.11.2 Non-Indigenous Heritage

No items of European heritage are present within the Invincible Colliery site and therefore there are no specific management measures required to be implemented.

6.12 Spontaneous Combustion

There are no known occurrences of spontaneous combustion at Invincible Colliery. Experience to date in mining at the Invincible Colliery has demonstrated that the waste material, stockpiled coal and other relevant materials have a low propensity to spontaneously combust. Any future extraction, processing and stockpiling of coal will continue to be managed to ensure any potential for spontaneous combustion is minimised.

6.13 Bushfire

Bushfire hazards are managed in accordance with the LMP (Coalpac, 2009f). A number of measures and safeguards have been implemented to minimise bushfire risk at Invincible Colliery, these include:

- fitting fire extinguishers to all earthmoving and mining equipment
- fitting and maintaining efficient exhaust systems and spark arresters to mobile equipment
- advising NSW Rural Fire Service, regulatory authorities and neighbours of any burning-off operations
- ensuring that vehicles with low level exhaust systems do not leave defined tracks in locations and conditions likely to lead to ignition of combustible plant material and, and
- maintaining, at the request of NSW Forestry Corporation, existing fire trails or access roads at the extremities of the lease area, which serve as access for fire-fighting services as well as establishing a fire break to the limits of operations at the open cut.

6.14 Mine Subsidence

Mining operations at Invincible Colliery ceased in 2013. There was no mining undertaken during the reporting period. As such, no subsidence management measures were required to be implemented.

6.15 Public Safety

Access to working areas of the open cut are controlled by locked gates. Access to the site by members of the public is via contact at the mine office where visitors or contractors can only be escorted around the site by site personnel. Warning signs have been placed on extremities of operations to make members of the public aware of the presence of the open cut. There were no public safety incidents during the reporting period.

7.0 Water Management

7.1 Water Management System

The strategy behind the surface water management plan is to keep the clean and dirty water systems separate by interception and diversion of stormwater runoff from operational and non-operational areas. The water management system at Invincible Colliery has been designed (as far as possible) as a closed loop system. Water that enters the site via rainfall or through the water table is diverted to a series of settlement dams within the site.

There are 5 active sediment dams (SD2, SD3, SD4, SD5 and SD6), one Environmental Dam (SD1), one storage dam (Main Water Dam – LD002), 2 sediment ponds, one clean water storage dam located within the Aboriginal Heritage site (OS-1) and 7 inactive fine reject dams currently on site. The Main Water Dam has a total capacity of 117 ML. The remaining dams have the following capacities:

- SD1 – 0.5 ML
- SD2 – 4.8 ML
- SD3 – <0.5 ML
- SD4 -47.8 ML
- SD5 – 2.3 ML
- SD6 – 1.5 ML

The Environmental Dam which contains acid water is monitored on a regular basis by site personnel. The Environmental Dam is fitted with an automatic pump out unit to ensure the water level remains low. Due to the permeable nature of the waste rock that is back-filled into the completed open cut excavation, and the proximity of the open cut to the abandoned underground workings, the majority of surface water runoff collected in pit sumps, fine reject dams, coal stockpile areas, active mining areas and waste dumps seeps down into the abandoned underground workings. Water from the abandoned underground workings is used for dust suppression and accessed from Pit 205. Any excess water, that meets the required water quality criteria, will be released from the Main Dam, LD002 which is a licenced discharge point under the EPL.

7.2 Water Take

There has been no water drawn from external sources under licences (detailed in Error! Reference source not found. **7.1**). Water is currently sourced from the existing connection to the Fish River Water Supply pipeline.

Table 7.1 Water Take

Water Licence #	Water sharing plan, source and management zone (as applicable)	Entitlement	Estimated Take Previous Period – 2021 (ML)	Estimated Take Current Period – 2022 (ML)
WAL 35978 (10BL602584)	NSW Murray-Darling Porous Rock Groundwater Sources Water Sharing Plan	26 units	0	0

7.3 Erosion and Sediment Control

7.3.1 Environmental Management Measures

Permanent erosion and sediment control (ESC) measures within the Invincible Colliery include containment and diversion of "clean" water around disturbed areas and containment of runoff from these disturbed areas within on-site sediment dams. Temporary measures include contour banks, drainage lines, and rock lined drop structures. Where inspections identify failure of ESC measures, repairs and rectification works are undertaken as required.

7.3.2 Environmental Outcomes and Proposed Improvements

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

James Bailey & Associates (JBA) were commissioned by Castlereagh Coal to complete a review of water management and erosion and sediment control (ESC) structures located within areas of rehabilitation established at Invincible Colliery. The review was based on a desktop review of related environmental management plans and recent monitoring documents completed for Invincible Colliery, as well as observations made during subsequent field inspections completed by JBA in December 2022.

The review complements the work undertaken by Umwelt (2022) in response to directives provided to Castlereagh Coal from the NSW Resources Regulator in relation to ESC management within the Invincible Colliery as discussed in **Section 4.3**.

A summary of the key observations and recommendations from the ESC review are provided below.

"In general, ESC management principles are being implemented in accordance with site approvals and management documentation, with no significant failures identified. However, it is recommended that Castlereagh Coal implement a risk-based process to complete and document regular ESC inspections at both sites. This procedure should include an outline of key monitoring locations to be assessed by Castlereagh Coal personnel during ESC inspections. These inspections should be undertaken at least quarterly, with additional inspections to be completed following significant rainfall events;

*Localised erosion issues and deficiencies in drainage and water management structures are present within rehabilitation areas that should be scheduled for maintenance (see **Section** Error! Reference source not found.). However, it is noted that constraints exist at both CVM and Invincible that may impact on the ability to access some areas of the rehabilitation and water management systems, primarily due to with steep slopes and vegetation communities developing within the rehabilitation. It is recommended that Castlereagh Coal review each area prior to scheduling any physical work to balance these constraints against the need to complete remedial actions;*

Legacy issues relating to the design of and materials used for the drop structures in rehabilitation areas at both sites. Contour drains reporting to these structures is showing evidence of scouring, with the rock lining of the drop structures also showing evidence of weathering, which reduces their overall effectiveness in supporting rehabilitation development. It is noted that these structures were initially developed as temporary ESC controls for the rehabilitation establishment and development phase. Removal of these structures will be considered during detailed mine closure planning;

SD3 at Invincible requires maintenance work to ensure that it is desilted, adequately sized and maintained in accordance with Blue Book (Landcom, 2004) requirements;

While vegetation cover is generally present in rehabilitation areas, some areas of limited vegetation cover were identified at both sites. The relatively poor performance of vegetation growth within these areas may impact on the stability of rehabilitation areas in the long term due to a heightened risk of erosion; and

A need to re-establish rehabilitated landform batters, ESC controls and vegetation in areas of CVM where subsurface heating is present, once remediation works have been completed."

8.0 Rehabilitation

Rehabilitation of disturbed land at Invincible Colliery has previously been undertaken in accordance with the approved Mining Operations Plan (C&M MOP) required under the Mining Lease conditions and Development Consent (PA 07_0127).

A Rehabilitation Management Plan (RMP) was prepared by Invincible Colliery to satisfy the requirements of the Invincible Colliery ML conditions and PA 07_0127 in July 2022.

An amendment to the Mining Regulation 2016 under the Mining Act 1992, commenced on 1 July 2021. The amendment provided new standard rehabilitation conditions for mining leases which replaces existing mining lease conditions. The RMP replaces the Invincible Colliery Mining Operations Plan (C&M MOP). The RMP is available on the Castlereagh Coal website.

An Annual Rehabilitation Report and Forward Program (ARRFP) has also been prepared and submitted for Invincible which provides details of the scheduled surface disturbance and rehabilitation activities at the Invincible Colliery from 26 November 2022 to 25 November 2025.

A summary of the rehabilitation objectives, performance indicators and completion criteria relevant to the Invincible rehabilitation domains is provided in the RMP. Plan 1 (Appendix A) in the RMP shows the conceptual final landform features.

8.1 Status of Mining and Rehabilitation

Unshaped emplacement areas as well as access tracks and water management structures are inspected by site personnel with maintenance and repairs undertaken as required. The current status of mining and rehabilitation areas within the mine domains established is provided in **Table 8.1.** During the reporting period, there was no rehabilitation or mining works undertaken at Invincible Colliery.

Table 8.1 Rehabilitation Status

Mine Area Type	Previous reporting period (actual) 2021 (ha)	This reporting period (actual) 2022 (ha)	Next reporting period (forecast) 2023 (ha)
Total Mine Footprint – Surface Disturbance	134.17	160.64	167.14
Total Active Disturbance	63.23	98.72	95.15
Rehabilitation – Land Preparation	9.1	0	10.07
Ecosystem and Land Use Establishment	0	0	0
Ecosystem and Land Use Development	61.84	61.93	61.93
Rehabilitation Completion	0	0	0

8.2 Post Rehabilitation Land Uses

The proposed final land use aims to emulate the pre-mining environment and will enhance local and regional ecological linkages across the site and with adjacent areas. The primary objective of site revegetation and regeneration is to create a stable final landform with acceptable post-mining land use and suitability. In the long term, rehabilitation areas will become integrated with adjacent native vegetation communities.

A Rehabilitation Strategy (Castlereagh Coal, 2022a) has been prepared for Invincible Colliery and incorporates the Southern Extension Project area. The Rehabilitation Strategy includes an investigation into the various options for backfilling of the remaining voids onsite, options to avoid the disturbance of vegetation in proximity to the Eastern Void and includes a detailed description of the measures to be implemented and a plan for the implementation of these measures.

Rehabilitation areas will continue to be monitored on an annual basis and will be managed until self-sustaining. Final rehabilitation areas will achieve the rehabilitation completion criteria prior to relinquishment.

8.3 Completion Criteria Assessment

The revised rehabilitation objectives and completion criteria for Invincible Colliery were submitted to the Resources Regulator (RR), during the reporting period, for review and approval as a requirement of the new Rehabilitation Management Plan process. On 20 March 2023 the RR provided feedback and refused the Invincible Colliery Objectives Statement. Invincible Colliery are required to submit a new Rehabilitation Objectives Statement by 1 May 2023, addressing the reasons given by the RR for refusal. **Table 8.2** provides a summary and assessment of compliance of the monitoring results against the relevant biodiversity and rehabilitation performance and completion criteria for Invincible Colliery outlined in the LMP (Coalpac, 2009f).

8.4 Rehabilitation Activities

Although the mine is in care and maintenance, management and monitoring of rehabilitation areas is undertaken in accordance with the approved Invincible Colliery LMP (Coalpac, 2009f).

Areas of rehabilitation to the north of the site were shaped in 2015. The Invincible Colliery washery was removed during the reporting period. Rehabilitation activities undertaken during the reporting period included:

- assessment of rehabilitation areas to determine if further works are required / how they have performed following improved rainfall conditions (i.e. monitoring); and

- repair of erosion washouts on site.

In the long term, rehabilitation areas are to become integrated with adjacent native vegetation communities with this process detailed in the revised RMP and BMP which have been submitted to regulatory authorities for comment.

An assessment of rehabilitation performance against completion criteria is included in **Table 8.2** below. As noted previously these criteria are being refined as part of revised Rehabilitation Management Plan. It is noted that there are areas which have been disturbed by mining which are yet to be rehabilitated. These disturbed areas do not form part of the general assessment presented in **Table 8.2**.

Table 8.2 Assessment of Monitoring Results against Invincible Colliery Completion Criteria

Rehabilitation Criteria	Standard or Milestone Required	Suggested Corrective Action	Results and Outcomes of 2022 Monitoring
1. Planning Stage			
Consideration of the completion criteria for the planning stage of the project are not relevant to this monitoring report and have not been considered further			
2. Establishment Stage			
Consideration of the completion criteria for the establishment phase of the project are not relevant to this monitoring report and have not been considered further.			
3. Development and Sign-Off Stages			
3.1 Vegetation Establishment and Sustainability			
Tree species composition is compatible with that of other vegetation types in the lease, i.e. it includes:			
• local eucalypt species	A range of local eucalypt species are present	Plant or seed more species if required	A range of local eucalypt species are present within the Rehabilitation Areas
• local tall *Acacia* species	A range of local *Acacia* species are present	Plant or seed more species if required	A range of local Acacia species are present within the Rehabilitation Areas
Tree health	More than 75% of trees are healthy and growing as indicated by monitoring	Investigate causes of the problem and correct if required	**Satisfied.** Tree health within the rehabilitation areas appeared to be >75% healthy during the 2022 monitoring. There are patches of young Eucalyptus trees of poor health, but those that have established (10cm DBH or more) appear in good to very good condition. 2022 has been wetter than previous years, and may have been beneficial to further recruitment, particularly the tall Acacia species. Future monitoring will determine how the tree health within rehabilitation areas will respond following favourable environmental conditions.
Leaf nutrient analysis	Nutrient analyses conducted on trees in representative areas indicate no deficiencies of key macro- or micro-nutrients	Investigate causes of any problems and address as required	**Generally satisfied.** No nutrient analyses were undertaken as part of the 2022 biodiversity monitoring. There were no areas within any plot that showed high degrees of stress where leaves were yellow or discoloured, or blotchy.

Rehabilitation Criteria	Standard or Milestone Required	Suggested Corrective Action	Results and Outcomes of 2022 Monitoring
Tree density	Monitoring or visual estimation show the density of eucalypt trees >2m tall to be >200 stems/ha, averaged over the rehabilitated area monitored	Plant or seed more trees if required	**Satisfied.** Tree densities within the rehabilitation areas appeared to be greater than 200 stems per hectare.
Presence of treeless areas	No treeless areas greater than 0.5 ha are present	Correct using planting or seeding if required	**Satisfied.** No treeless area greater than 0.5 ha was observed during the 2022 monitoring.
Evidence of tree regeneration	Second generation tree seedlings are present or likely to be, based on monitoring or research in comparable older sites	Conduct follow-up assessment later, or add seed if required	**Satisfied.** Second generation Acacia seedlings was continuing to establish at monitoring locations R10, R11, R12, R14 and R18, while a small number were recorded in the surrounds of R15. Second generation Acacia seedlings were found to occur in proximity to patches of senescence (plant death due to age). Eucalypt seedlings were recorded at monitoring sites R10, R11, R12 and R14, as well as in the surrounds of R15. Eucalypt and Acacia seedlings / juveniles were noted at BO sites with the exception of B09. Further monitoring is to be undertaken in subsequent years to confirm the success of natural regeneration over time.
Sufficient grass or shrub cover, rocks, logs, etc. are present on steeper slopes to control erosion in the long-term	Monitoring and visual estimation show grass or shrub cover to be >50% on these areas, or sites have sufficient rock cover to maintain erosion below target standards (see Criteria 3.3)	Where necessary, delay closure until grass and shrub cover increases, or increase cover by seeding	**Satisfied.** Monitoring and visual estimation during 2022 recorded grass or shrub cover to be >50% in the Invincible Rehabilitation Areas monitored. Observations of ground cover were similar to 2020 and 2021 monitoring, however compared with previous years, grass and shrub cover had increased following the easing of prolonged drought conditions experienced in the region 2017- 2020. No major areas of erosion were evident during monitoring.

Rehabilitation Criteria	Standard or Milestone Required	Suggested Corrective Action	Results and Outcomes of 2022 Monitoring
Presence of bare areas on outer slopes	No bare areas that have obviously failed and are greater than 0.1ha in total area, or greater than 5m in width extending >10m down the slope, are present	Increase soil quality to assist grass and herb cover on bare areas, this may include increasing organic matter content to promote soil structures	**Satisfied.** Areas of bare ground were uncommon across the Invincible rehabilitation area. Areas of bare ground that were recorded were present in areas with dense shrub layers. Overall, the Rehabilitation Areas inspected were considered to meet this criterion.
Understorey plants	A range of native shrubs, grasses and other understorey species have established through topsoil, seeding or recolonisation	Investigate the feasibility of establishing more shrub or grass species and do so if practicable	**Satisfied.** Cover and abundance for a range of native shrubs, grasses and other understorey species continued for 2022 monitoring due to above average precipitation since mid-2020. The coverage of understorey plants will likely fluctuate with weather conditions, and as shrubs and trees become more established, the ground layer coverage may reduce due to shading, or there will be a shift in species dynamics that favour more shade tolerant species. Future monitoring will determine how the native species diversity of rehabilitation areas will respond following favourable environmental conditions.
Noxious weeds	A management program for the control of declared plants and other weeds such as Pampas Grass and Crofton Weed has been implemented on the site	Control declared plants and other problem weeds as per the management program	**Satisfied.** A management program is in place to control noxious weeds and weed control is undertaken as required. On the lower slope adjacent to a creek line near B05, there is an extensive area of Blackberry that requires control.
Fire tolerance	Tree, understorey and grass species are capable of either surviving or regenerating following a fire	Rehabilitation may be too young to determine this; investigate using research and/or literature review of relevant research on other mines	**Satisfied.** Impacts to rehabilitation areas from the 2019/2020 bushfires were less severe than in remnant vegetation, indicating that the rehabilitation has some degree of fire tolerance. Future biodiversity monitoring will inform the level of fire tolerance for this area.

Rehabilitation Criteria	Standard or Milestone Required	Suggested Corrective Action	Results and Outcomes of 2022 Monitoring
Drought tolerance	Tree, understorey and grass species are capable of surviving drought	If large-scale deaths have occurred, consider the need for replanting or reseeding, and whether more drought tolerant species should be included in the seed mix	**Satisfied.** Drought conditions have eased in the region following extended drought conditions 2017-2020 (DPI 2021). Monitoring results since 2017 indicate the rehabilitation areas, appear to be relatively tolerant given the lack of rainfall. This was evident in the 2021 monitoring results as shrub and tree health did not appear to decline as a result of the drought. This degree of drought tolerance is also evidenced by the presence of Acacia and Eucalypt saplings and reproductive material at most sites. Groundcover has improved following the easing of drought, particularly native grasses which were recorded in high abundances and were seeding. It is expected, however, that a reduction in the cover of grasses and other native groundcover is expected following the very favourable conditions experienced during fluctuations of environmental conditions, as this is a natural response for native flora. Ongoing monitoring is required to determine the condition of biodiversity values as they continue to respond to suitable conditions following the extended drought period.
Sustainability	Monitoring and research results indicate that the rehabilitation is likely to be sustainable over the long-term, if managed according to the procedures defined in Criteria 4 below	Continue monitoring in accordance with approved Flora and Fauna Management Plan / Biodiversity Management Plan	**Generally satisfied.** Consistency seen in qualitative descriptions suggest that the rehabilitation may be sustainable over time, however ongoing monitoring is required to assess these criteria.

Rehabilitation Criteria	Standard or Milestone Required	Suggested Corrective Action	Results and Outcomes of 2022 Monitoring
3.2 Fauna habitat and faunal recolonisation			
Habitat	Fauna habitat in rehabilitated areas matches that in some surrounding un-mined open forest/woodland areas, or will do so in time	Investigate whether further planting or seeding might be required as per Criterion 3.1	**Generally satisfied.** Rehabilitated Areas are not old enough to support the range of habitats provided by the surrounding remnant forests and woodlands. The rehabilitated areas are progressing towards the pre-existing or surrounding landforms.
Diversity of vegetation	Includes a range of vegetation structural habitats, e.g. eucalypts, shrubs, ground cover and a developing litter layer	Investigate whether further planting or seeding might be required as per Criterion 3.1	**Satisfied.** Overall, plant species diversity has had minor change from the previous monitoring period, although biomass may have increased slightly. Juvenile Eucalyptus and Acacia plants are evident at most sites indicating good succession, and leaf litter is increasing as these species become taller and more robust. It is expected that the areas will trend over time to satisfy the completion criteria.
Fauna recolonisation - invertebrates	Studies demonstrate that key invertebrate functional groups such as ants and soil faunal communities are re-establishing	Investigate the causes where key groups have not recolonised	Invertebrate studies have not been undertaken previously and were not conducted in 2022.
Fauna recolonisation - vertebrates	Vertebrate surveys demonstrate that bird, mammal, reptile and frog communities are becoming established in rehabilitated sites	Investigate the causes where key vertebrate groups have not recolonised	**Satisfied.** We expected that faunal communities will continue to establish towards a similar number to those recorded in the surrounding un-mined vegetation as the diversity of habitats progressively improve. Further evidence will be drawn from future monitoring events as habitat corridors continue to establish and permanent habitat features become more frequent.
Management of fauna habitat in un-mined areas	Fauna habitat of adjacent un-mined areas has been protected as stipulated in this Plan	Protect areas of adjacent native fauna habitat	**Satisfied** Fauna habitat of adjacent un-mined areas has been protected as stipulated in the LMP.

Rehabilitation Criteria	Standard or Milestone Required	Suggested Corrective Action	Results and Outcomes of 2022 Monitoring
Management of rare species habitat	Habitat of rare or vulnerable fauna species, such as the Common Bent- winged Bat, Little Bent-winged Bat and the Squirrel Glider, has been managed to promote the species conservation	Take necessary steps to conserve habitat considered likely to provide habitat for these species	**Satisfied** Habitat of rare or vulnerable fauna species, such as the Common Bent- Winged Bat, Little Bent-winged Bat and the Squirrel Glider, has been managed to promote the species conservation as stipulated in the LMP.
3.3 Landform stability			
Absence of significant erosion - gullies	No erosion gullies >1m deep and 1m wide are present on any outer slopes	Gullies which fail to meet the standard should be reshaped and replanted if required	**Generally satisfied** No erosion gullies of this size were identified within the areas visited during the monitoring surveys. Small rills were observed, e.g. R15 on the steeper slope, and surrounding area.
Integrity of waterways	If still required, any constructed waterways are still in good working condition	Repair waterways if required	Not assessed as part of report period.
Graded banks have been removed	To avoid overtopping, after establishment of adequate vegetation cover, graded banks will be removed	Remove when appropriate	Not assessed as part of report period.
Final void	Standards or milestones relating to a final void will be developed if applicable	Refer to Mine Closure Plan	Not assessed as part of report period.
3.4 Soil Suitability			
Not assessed as part of annual biodiversity monitoring.			

Rehabilitation Criteria	Standard or Milestone Required	Suggested Corrective Action	Results and Outcomes of 2022 Monitoring
3.5 Land Use Suitability			
Suitability for nature conservation	Areas of rehabilitation and adjacent un-mined areas together possess defined conservation values and could be managed for the purposes of conserving a range of local flora and fauna species and vegetation types, including any rare fauna species recorded	Determine whether further revegetation or other management procedures may be required	**Satisfied.** Areas of rehabilitation and adjacent un-mined areas together possess conservation values and could be managed for the purposes of conserving a range of local flora and fauna species and vegetation types. Conservation of the peripheral areas is positive action towards maintaining habitat to a wide range of species and protecting and enhancing habitat for species such as the Gang-gang Cockatoo.
Protection of water quality	Water quality, landform design, geotechnical stability and vegetation monitoring data all suggest that sites are not likely to pose a threat to downstream water quality	Implement corrective procedures if required	Not assessed as part of the annual biodiversity monitoring program.
Long-term management	Management requirements have been defined (see Criteria 4 below). Long-term management operations (e.g. maintenance of access tracks, fire) will not be greater than those of areas prior to mining, or where extra management actions may be required, a mechanism has been put in place for addressing these	Develop long-term management plan as in Criteria 4 below	Not assessed as part of the annual biodiversity monitoring program.
3.6 Safety			
Not assessed as part of biodiversity monitoring report.			
4. Monitoring and Maintenance Stage			
Monitoring and maintenance requirements to addresses post-closure and post-relinquishment is not relevant to this monitoring report and is not addressed further.			

9.0 Community

9.1 CCC Meetings

Two community consultation meetings were held during the reporting period. The meetings were held in March and November 2022.

The outcomes of the CCC meetings are detailed in the meeting minutes available on the Castlereagh Coal website.

9.2 Complaints

In accordance with Condition M5 of the EPL, a community complaints line is operated by Invincible Colliery during the hours of operation. The complaints line is (02) 6359 0600 which is also displayed on the Castlereagh Coal website. This contact point provides the community with a mechanism by which to raise any concerns that they have with operations at Invincible Colliery.

Shoalhaven Coal maintains a complaint register to record and respond to complaints received from the community. There were no complaints received from the local community in relation to care and maintenance activities at Invincible Colliery during the reporting period. A comparison of complaints received between 2018 and 2022 is outlined in **Table 9.1**.

There have been no complaints received relating to operations at Invincible Colliery since the mine was placed in care and maintenance in May 2013. Prior to 2013 and during previous mining operations, the majority of complaints received were in relation to traffic and other amenity aspects.

Table 9.1 Comparison of Complaints for Invincible Colliery 2018 – 2022

Complaint Type	2018	2019	2020	2021	2022
Noise	0	0	0	0	0
Air quality	0	0	0	0	0
Blasting	0	0	0	0	0
Traffic	0	0	0	0	0
Water	0	0	0	0	0
Other	0	0	0	0	0
Total	0	0	0	0	**0**

10.0 Independent Audit

An Independent Environmental Audit (IEA) was conducted during 2016 in accordance with Schedule 5, Condition 5 of the Project Approval. The audit period included the care and maintenance period from May 2013 to January 2016. The mine was operated by the previous mine owner Coalpac from May 2013 to May 2015. Shoalhaven Coal (under the Manildra Group) was responsible for operations between May 2015 and January 2016 with many of the non-compliances detected by the audit being outside of Shoalhaven Coals control. In addition, a large number of the non-compliances that have occurred during Shoalhaven Coal's ownership are as a direct result of historical practices conducted by Coalpac.

An action plan was developed as an outcome of the audit findings and follow up actions have been implemented as required in consultation with DPE. The status of each audit action plan item can be found in **Appendix 3**. As seen, Shoalhaven Coal has completed many of the audit action items or a number of the items will be resolved through the development of revised management plans for the recommencement of mining operations.

In accordance with Condition 11 of Schedule 5 of the Project Approval, an IEA is required within a year of the recommencement of mining operations. The results of the IEA when completed, will be reported in the subsequent Annual Review.

11.0 Incidents and Non-Compliances during the Report Period

There were no environmental incidents causing or threatening material environmental harm at Invincible Colliery during the reporting period. The Invincible Pollution Incident Response Management Plan was not activated during the reporting period with review of the PIRMP being undertaken in December 2022 (refer to the Castlereagh Coal website). Non-compliances which occurred during the reporting are discussed in in **Section 1.0**.

12.0 Activities to be Completed in the Next Reporting Period

Activities to be completed in the next reporting period (i.e. during 2023) will include:

- Undertake works required by the Project Approval and EPL, should the recommencing of mining activities be confirmed by Shoalhaven Coal.
- Review relinquishment opportunities for rehabilitation areas that have met relevant criteria.
- Completion of annual CCC meetings, as agreed with CCC members.
- Continuation of environmental monitoring.
- Implementation of the long-term management actions to address issues stemming from the Section 240 Notices ongoing consultation outcomes with the Resources Regulator.
- Attend to rehabilitation activities as per **Section 8.4.**
- Completion of annual CCC meetings, as agreed with CCC members.

13.0 References

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Castlereagh Coal (2022b). Invincible Colliery Southern Extension Water Management Plan.

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Coalpac Pty Ltd (2009c). Aboriginal Cultural Heritage Management Plan for the Invincible Open Cut Coal Mine Extension.

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Coalpac Pty Ltd (2009e). Invincible Open Cut Coal Mine Extension Blast Monitoring & Management Plan.

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APPENDIX 1

Figures & Plans

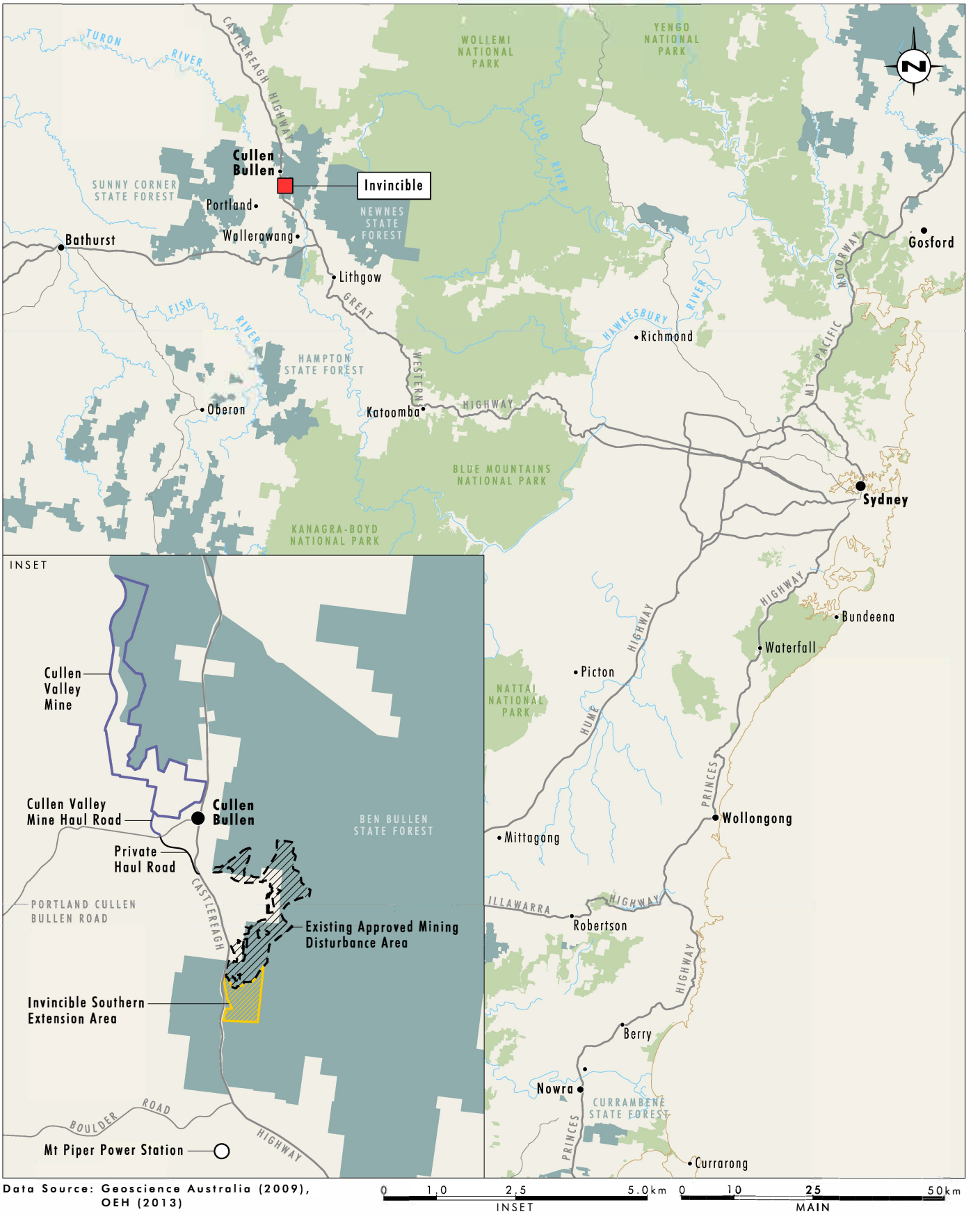
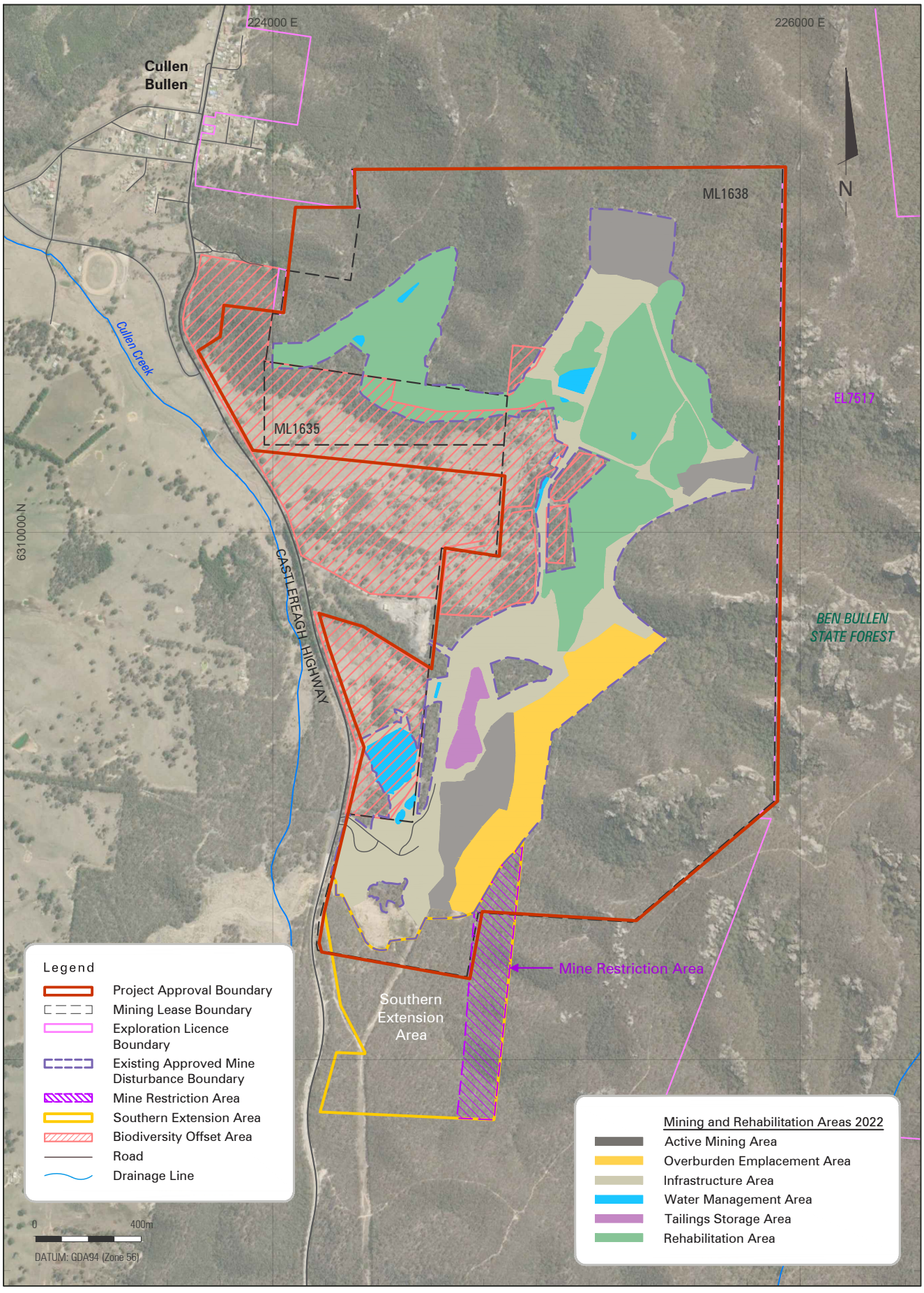


FIGURE 1

Locality Plan
Invincible Colliery



JBA 2328 002 - INV 2022 MINING AND REHAB (28/04/2023)

INVINCIBLE COLLIERY

2022 Mining and Rehabilitation Areas

FIGURE 2

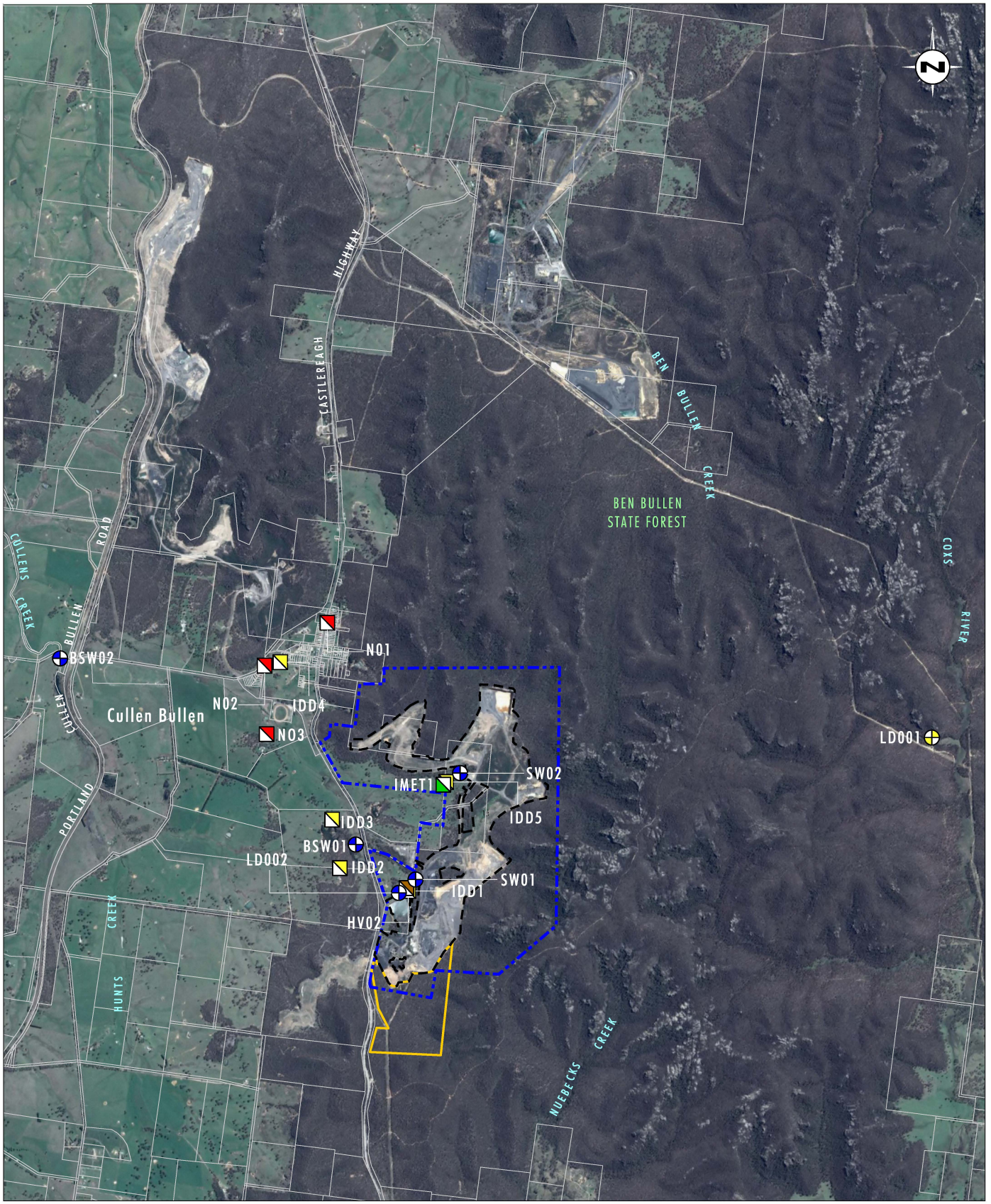


Image Source: Google Earth - CNES/Astrim (2016)

0 0.5 1.0 2.0km

1:50 000

Legend

- Existing Approved Mining Disturbance Area - Invincible
- Invincible Project Approval Boundary
- Approved Southern Extension Area
- Blast Monitoring Point
- Depositional Dust Monitoring Point
- Meteorological Station
- HVAS Monitor
- Noise Monitoring Point
- Surface Water Monitoring Point
- Groundwater Monitoring Point

FIGURE 3

Environmental Monitoring Locations
Invincible Colliery

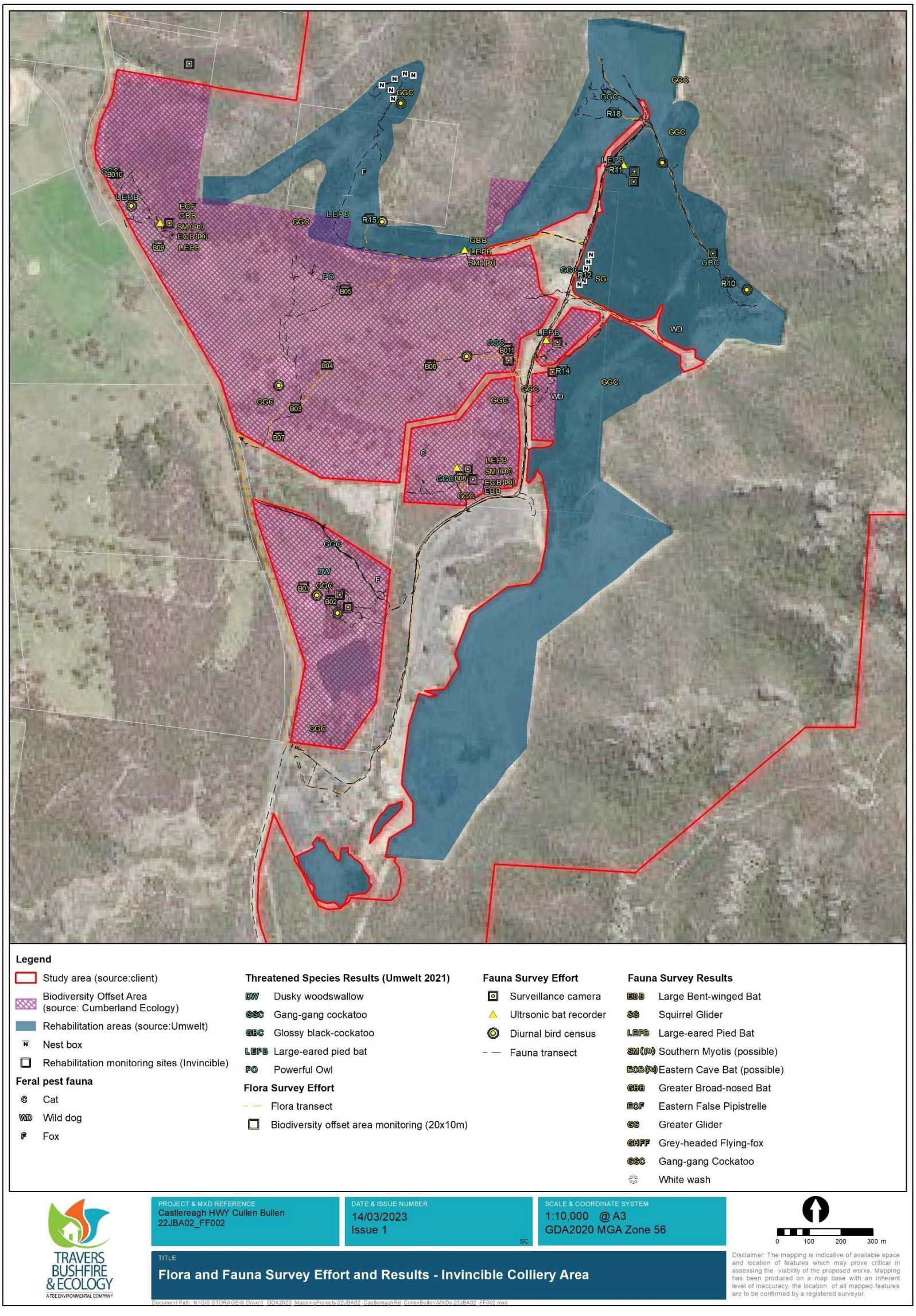


Figure 4 - Location of monitoring sites and recorded threatened fauna species at Invincible Colliery

APPENDIX 2

Monitoring Results

Air Quality

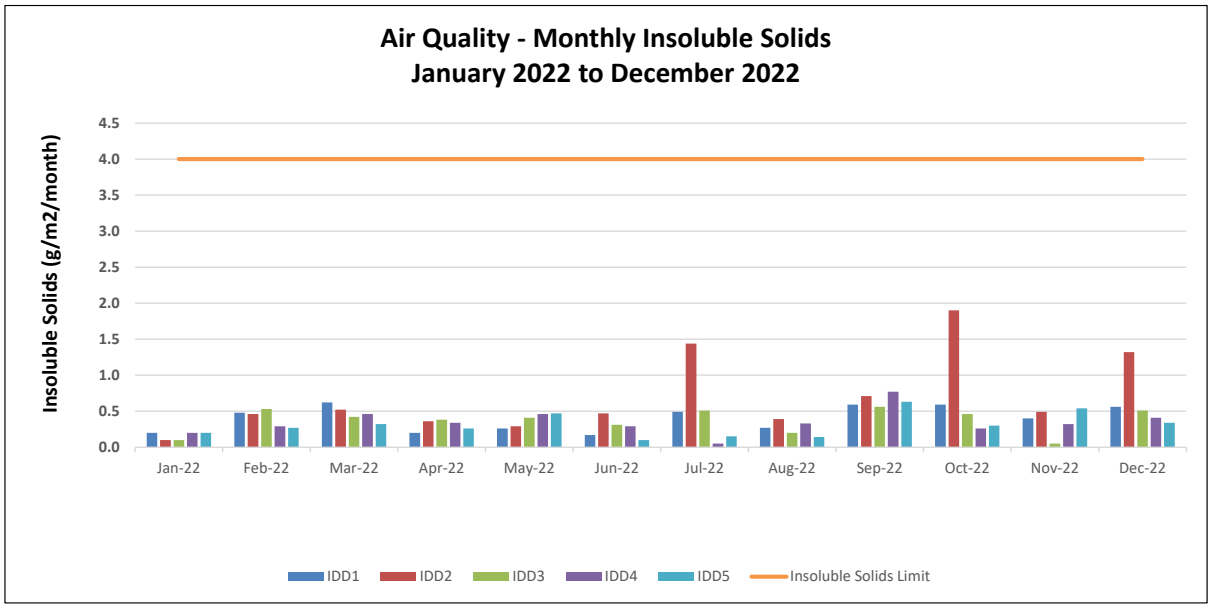


Figure 1: Depositional Dust Monitoring (Insoluble Solids) Results - 2022

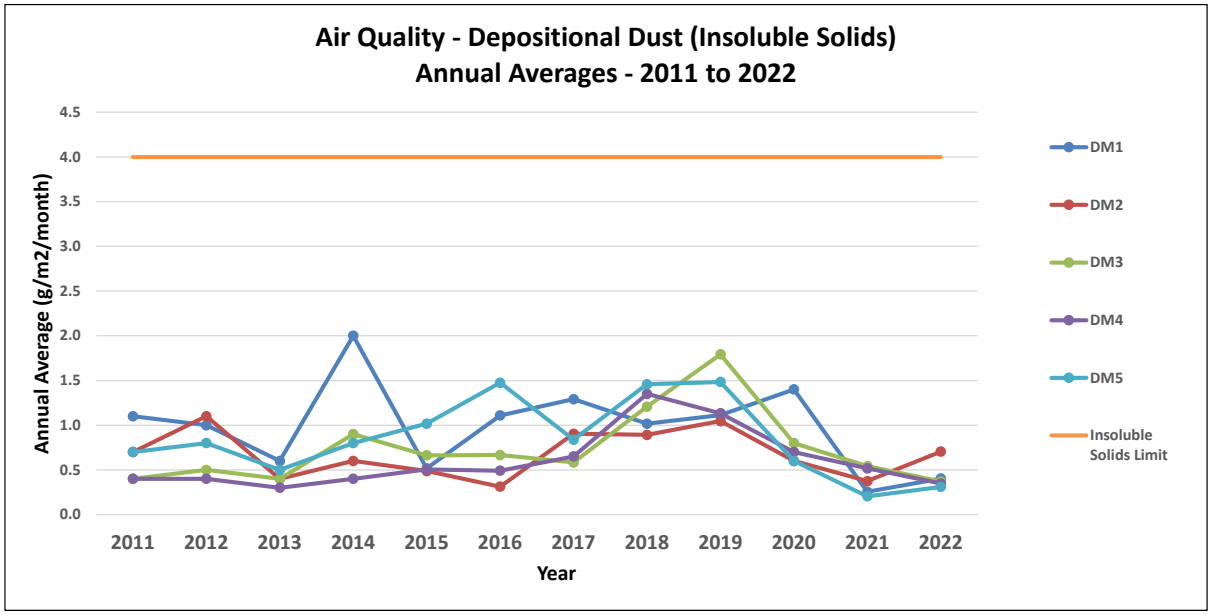


Figure 2: Depositional Dust Monitoring Historical Results

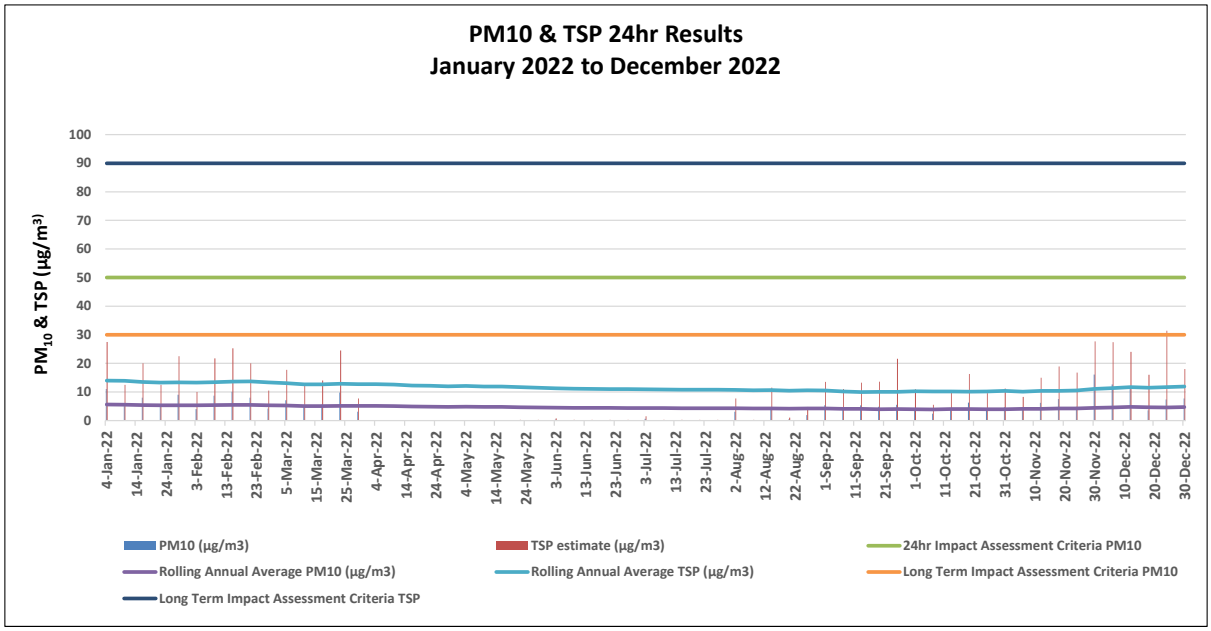


Figure 3: HVAS Monitoring Results - 2022

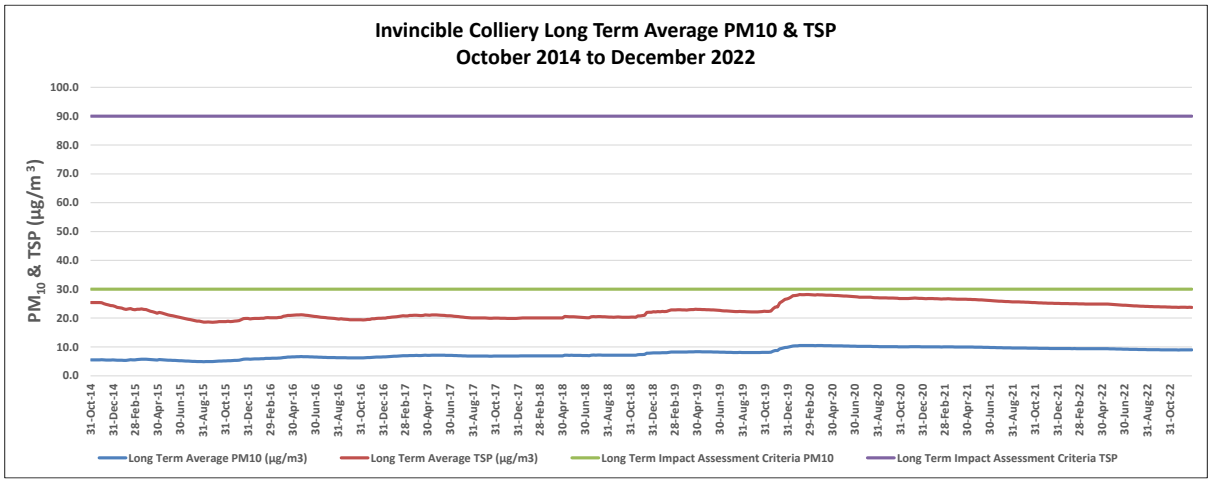


Figure 4: HVAS Monitoring Historical Results

Surface Water

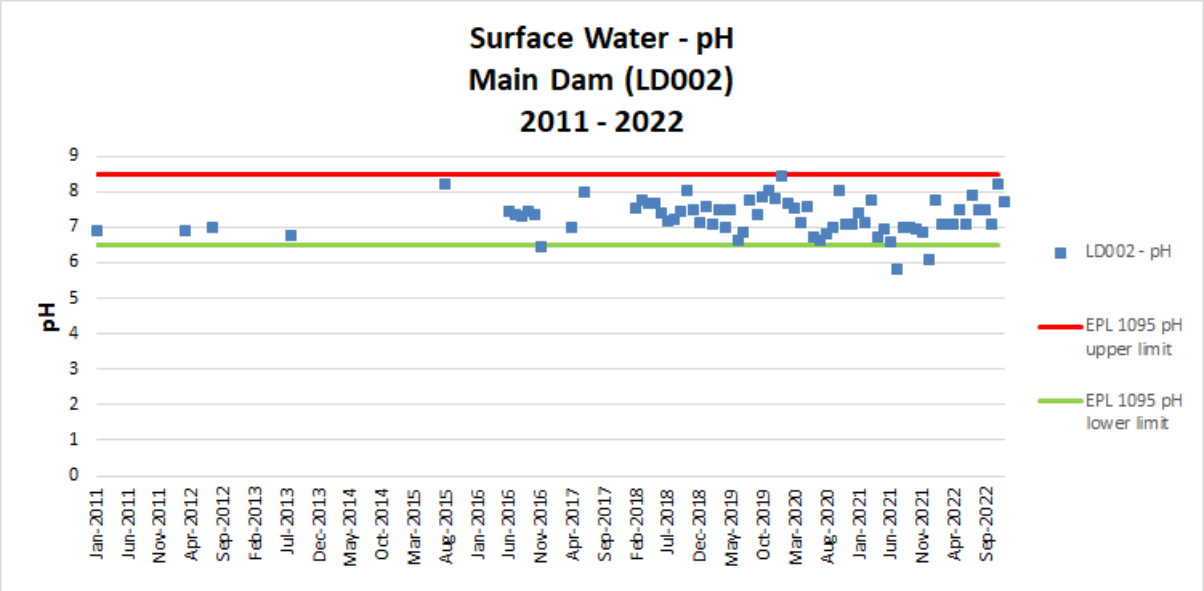


Figure 5: Surface Water (LD002-discharge) – Historical pH Results

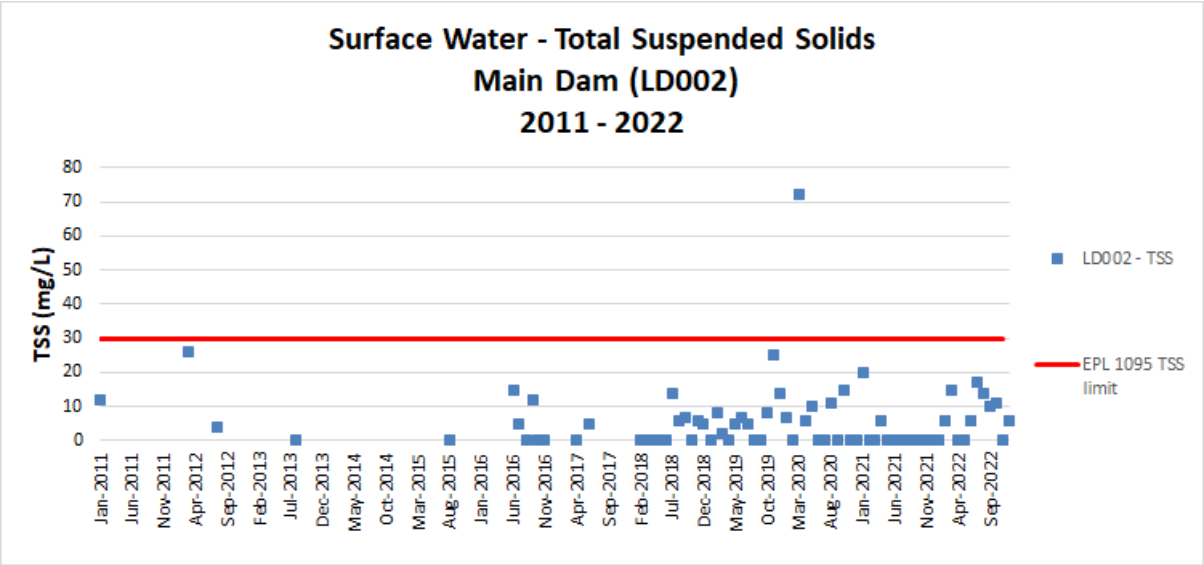


Figure 6: Surface Water (LD002-discharge) – Historical TSS Results

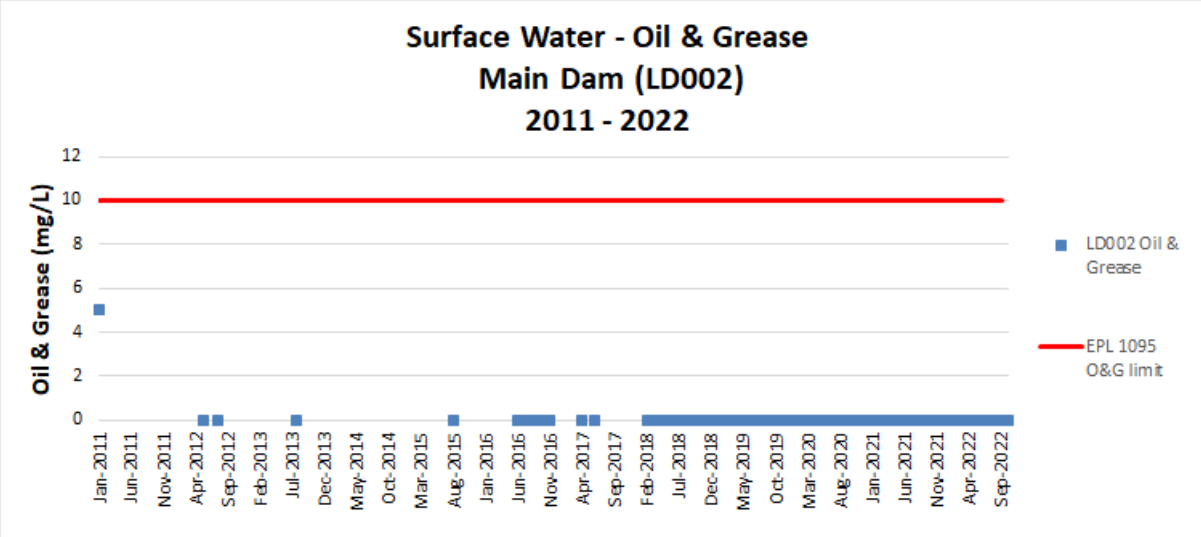


Figure 7: Surface Water (LD002-discharge) – Historical Oil and Grease Results

Table 1 – Monthly Monitoring Results Main Dam (LD002)

Main Dam (LD002)			
Sampling Date	pH	TSS (mg/L)	Oil & Grease (mg/L)
5/01/2022*	7.8	<5	<5
22/02/2022*	7.1	6	<5
7/03/2022*	7.1	15	<5
4/04/2022*	7.1	<5	<5
26/05/2022*	7.5	<5	<5
20/06/2022*	7.1	6	<5
12/07/2022*	7.9	17	<5
8/08/2022*	7.5	14	<5
7/09/2022*	7.5	10	<5
12/10/2022*	7.1	11	<5
9/11/2022*	8.2	<5	<5
6/12/2022	7.7	6	<5

**Discharge event*

Table 2 – Monthly Monitoring Results Environmental Dam (SW01)

Environmental Dam (SW02)			
Sampling Date	pH	TSS (mg/L)	Oil & Grease (mg/L)
5/01/2022	3.0	14	<5
22/02/2022	2.9	<5	<5
7/03/2022	3.0	10	<5
4/04/2022	2.9	NR	<5
26/05/2022	3.1	<5	<5
20/06/2022	2.9	<5	<5
12/07/2022	3.2	6	<5
8/08/2022	3.0	7	<5
7/09/2022	3.3	5	<5
12/10/2022	3.6	<5	<5
9/11/2022	3.0	9	<5
6/12/2022	2.9	<5	<5

Table 3 – Monthly Monitoring Results Silt Dam (SW02)

Silt Dam (SW03)			
Sampling Date	pH	TSS (mg/L)	Oil & Grease (mg/L)
5/01/2022	7.5	14	<5
22/02/2022	7.7	25	<5
7/03/2022	7.1	26	<5
4/04/2022	7.1	NR	<5
26/05/2022	7.5	<5	<5
20/06/2022	7.4	7	<5
12/07/2022	5.5	7	<5
8/08/2022	7.9	8	<5
7/09/2022	7.7	8	<5
12/10/2022	7.8	<5	<5
9/11/2022	8.1	<5	<5
6/12/2022	7.8	8	<5

Table 4 – Monthly Monitoring Results Cullen Creek (BSW01-Upstream)

Cullen Creek (BSW01 - Upstream)			
Sampling Date	pH	TSS (mg/L)	Oil & Grease (mg/L)
5/01/2022	7.2	12	<5
22/02/2022	7.0	80	<5
7/03/2022	7.1	37	<5
4/04/2022	6.9	12	<5
26/05/2022	7.4	14	<5
20/06/2022	5.9	7	<5
12/07/2022	6.9	17	<5
8/08/2022	6.4	13	<5
7/09/2022	6.9	7	<5
12/10/2022	7.5	<5	<5
9/11/2022	6.6	15	<5
6/12/2022	7.4	6	<5

Table 5 – Monthly Monitoring Results Dulhunty's Creek (BSW02-Downstream)

Dulhunty's Creek (BSW02 - Downstream)			
Sampling Date	pH	TSS (mg/L)	Oil & Grease (mg/L)
5/01/2022	7.6	<5	<5
22/02/2022	no access	no access	no access
7/03/2022	no access	no access	no access
4/04/2022	no access	no access	no access
26/05/2022	no access	no access	no access
20/06/2022	no access	no access	no access
12/07/2022	no access	no access	no access
8/08/2022	no access	no access	no access
7/09/2022	no access	no access	no access
12/10/2022	no access	no access	no access
9/11/2022	no access	no access	no access
6/12/2022	no access	no access	no access

Groundwater

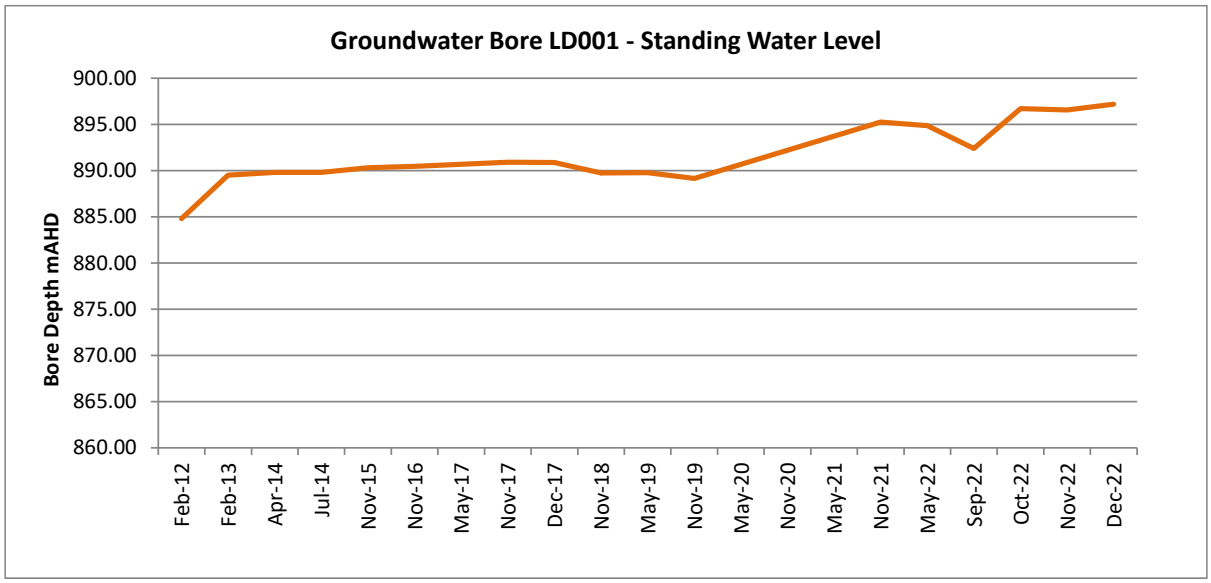


Figure 8: Groundwater Bore LD001 - Standing Water Level

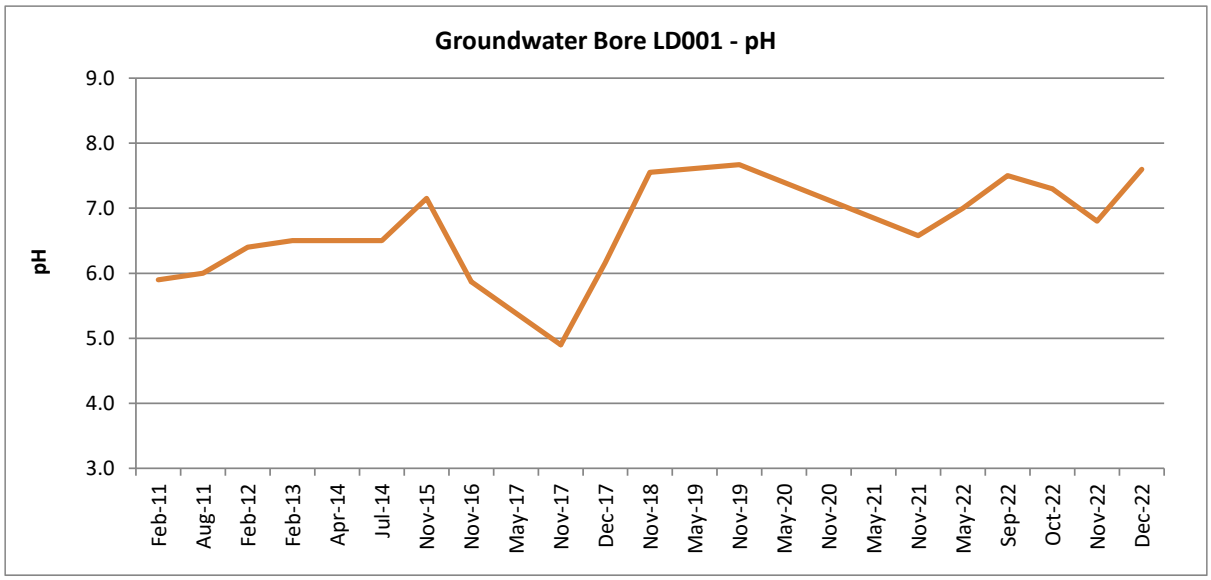


Figure 9: Groundwater Bore LD001 - pH

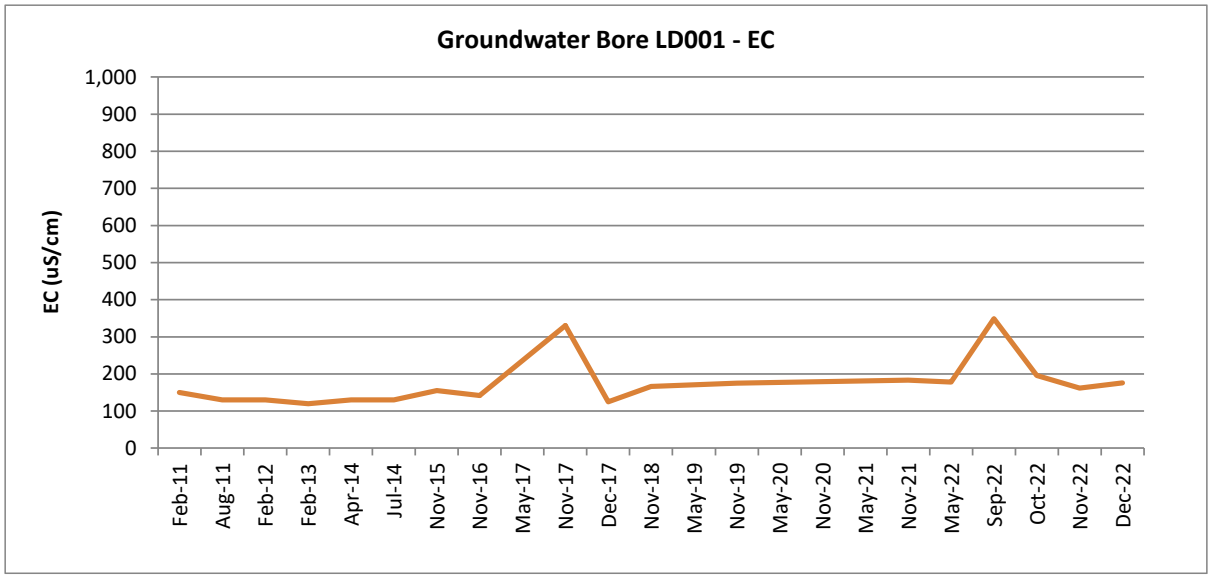


Figure 10: Groundwater Bore LD001 – Electrical Conductivity

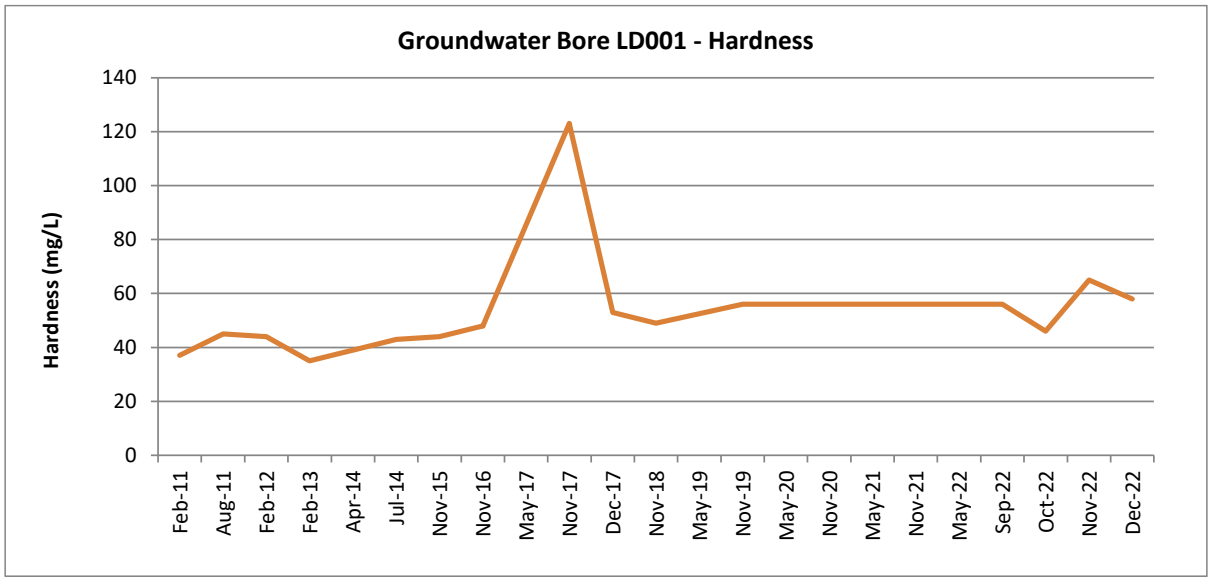


Figure 11: Groundwater Bore LD001 – Hardness

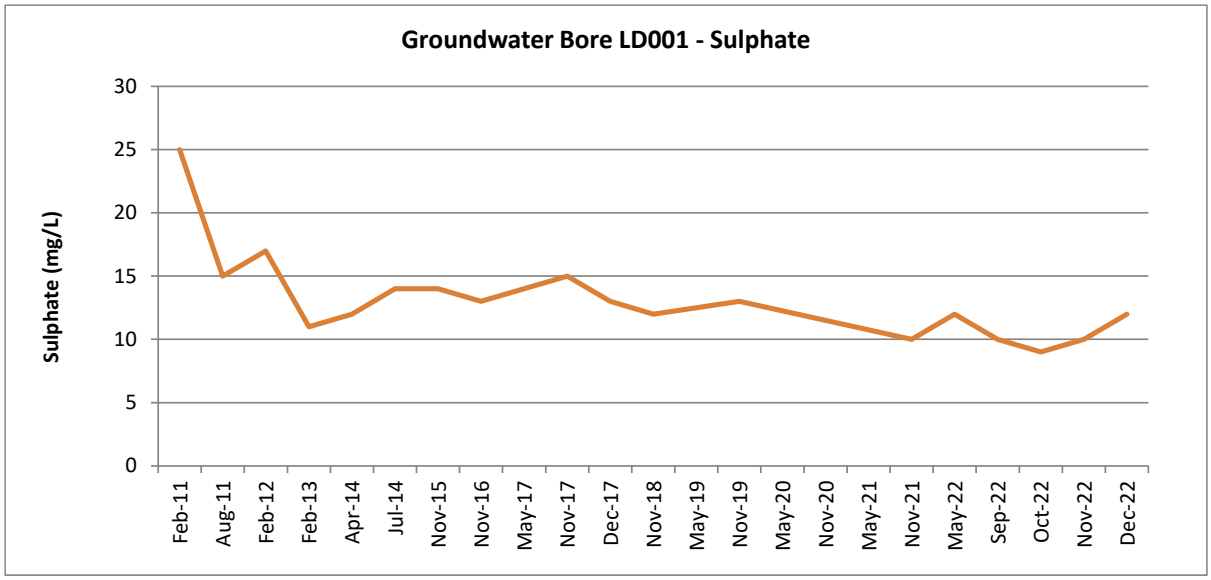


Figure 12: Groundwater Bore LD001 – Sulphate

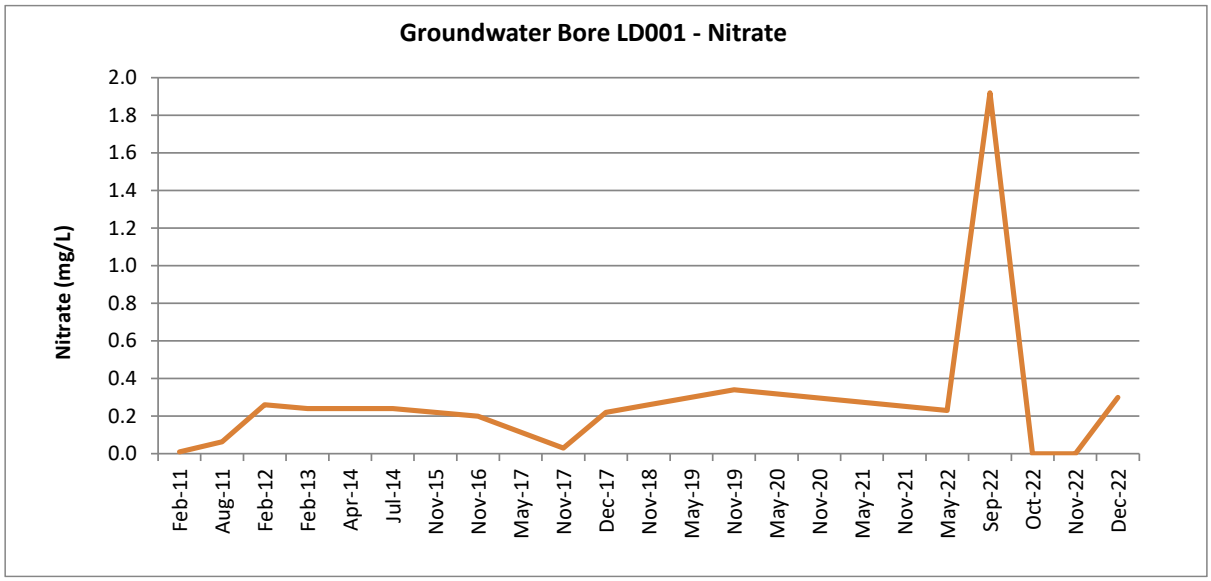


Figure 13: Groundwater Bore LD001 – Nitrate

Historical Noise Results

Historical noise monitoring results for years 2011 and 2012 are shown below. Contribution from Invincible was inaudible for all monitoring undertaken for 2013 – 2022.

Table 6 – Quarterly Noise Monitoring Results 2011

2011 Quarterly Noise Monitoring Results					
Location	**Criterion (dB)**	**Q1 ($L_{Aeq\ 15\ min}$)**	**Q2 ($L_{Aeq\ 15\ min}$)**	**Q3 ($L_{Aeq\ 15\ min}$)**	**Q4 ($L_{Aeq\ 15\ min}$)**
Cullen Bullen Central (N01)	40	IA	IA	IA	IA
Cullen Bullen West (N02)	40	IA	IA	IA	IA
Cullen Bullen South (N03)	40	IA	NM	IA	IA

IA – Noise from the mine was inaudible
NM – Noise was inaudible but not measurable

Table 7 – Quarterly Noise Monitoring Results 2012

2012 Quarterly Noise Monitoring Results					
Location	**Criterion (dB)**	**Q1 ($L_{Aeq\ 15\ min}$)**	**Q2 ($L_{Aeq\ 15\ min}$)**	**Q3 ($L_{Aeq\ 15\ min}$)**	**Q4 ($L_{Aeq\ 15\ min}$)**
Cullen Bullen Central (N01)	40	IA	<30	IA	IA
Cullen Bullen West (N02)	40	IA	<30	IA	IA
Cullen Bullen South (N03)	40	IA	34	IA	IA

IA – Noise from the mine was inaudible

APPENDIX 3

IEA 2016 Action Plan

2022 Update

ID	Criteria	Requirement	Audit Finding	Audit Recommendation	Responsibility (assigned by auditor)	Follow up Actions and Current Status	Status
NC1 **Low**	PA-07-0127, S2, C1	The Proponent shall implement all practicable measures to prevent and/or minimise any harm to the environment that may result from the construction, operation, or rehabilitation of the project.	The AEMRs stated that there were no reportable incidents of material harm to the environment during the audit period. A site inspection and review of documentation found no significant issues, however non compliances have been identified. In the Auditors' opinion, the intent of this condition to minimise harm to the environment has been established via various environmental management plans and the engagement of Sedgman in 2015 to manage implementation of these plans during the care and maintenance period.	Implement recommendations described below.	Castlereagh Coal	All non-compliances are addressed in this Action Plan and follow up actions have been implemented as required. **2017 – Annual Review Update** Continued implementation of the audit action plan to be undertaken during 2018, as they relate to project Approval (07_0127) as modified on 2 February 2018. **2018 – Annual Review Update** Continued implementation of the audit action plan to be undertaken during 2019, as they relate to project Approval (07_0127) as modified on 2 February 2018. **2019 – Annual Review Update** Continued implementation of the audit action plan to be undertaken during 2020, as they relate to project Approval (07_0127) as modified on 2 February 2018. **2020 – Annual Review Update** Continued implementation of the audit action plan to be undertaken during 2020, as they relate to project Approval (07_0127) as modified on 2 February 2018. **2021 – Annual Review Update** Continued implementation of the audit action plan to be undertaken during 2021, as they relate to project Approval (07_0127) as modified on 2 February 2018. **2022 – Annual Review Update** Continued implementation of the audit action plan undertaken during 2022, as they relate to project Approval (07_0127) as modified on 2 February 2018 Site remained in care and maintenance as new management plans were finalised and approved toward commencement of mining the Invincible Southern Extension in 2023.	Active
NC2 **Low**	PA-07-0127, S2, C2	The Proponent shall carry out the project generally in accordance with the: a) EA; b) statement of commitments; c) the modification application 07_0127 MOD 2 and accompanying documents entitled: • 'Proposed Modification to Project Approval 07_0127 for the Invincible • Colliery Open Cut Mine, May 2009'; and • 'Addendum to the Proposed Modification to Project Approval 07_0127 for the Invincible Colliery Open Cut Mine, July 2009' d) modification application 07_0127 – MOD 3 and the accompanying Environmental Assessment prepared by Hansen Bailey and dated June2010; and e) the conditions of this approval.	This scope of the audit incorporated a review of compliance against the Project Approval, Statement of Commitments, EPL and Mine leases only. Non-compliances with the conditions of the Project Approval (S2.2e) and Statement of Commitments (S2.2b) were identified during the audit as outlined in this compliance table.	Implementation of the recommendations in this audit will assist in ensuring the project is carried out in accordance with the Project Approval and Statement of Commitments.	Castlereagh Coal	All non-compliances are addressed in this Action Plan and follow up actions being implemented as required. **2017 – Annual Review Update** Continued implementation of the audit action plan to be undertaken during 2018, as they relate to project Approval (07_0127) as modified on 2 February 2018. **2018 – Annual Review Update** Continued implementation of the audit action plan to be undertaken during 2019, as they relate to project Approval (07_0127) as modified on 2 February 2018. **2019 – Annual Review Update** Continued implementation of the audit action plan to be undertaken during 2020, as they relate to project Approval (07_0127) as modified on 2 February 2018. **2020 – Annual Review Update** Continued implementation of the audit action plan to be undertaken during 2020, as they relate to project Approval (07_0127) as modified on 2 February 2018. **2021 – Annual Review Update** Continued implementation of the audit action plan to be undertaken during 2021, as they relate to project Approval (07_0127) as modified on 2 February 2018. **2022 – Annual Review Update** Continued implementation of the audit action plan undertaken during 2022, as they relate to project Approval (07_0127) as modified on 2 February 2018 Site remained in care and maintenance as new management plans were finalised and approved toward commencement of mining the Invincible Southern Extension in 2023.	Active

ID	Criteria	Requirement	Audit Finding	Audit Recommendation	Responsibility (assigned by auditor)	Follow up Actions and Current Status	Status
NC5 **Med**	PA 07_0127, S2, C14(a)	The Proponent shall ensure that all the plant and equipment used on site is: (a) maintained in a proper and efficient condition; and	The 2015 AEMR reports that most mobile plant and equipment has been removed from the site. Remaining equipment (such as excavators and dozers used for erosion control and rehabilitation maintenance and a mobile water pump) is periodically run, where possible, with pre-start inspections conducted at each instance. Sedgman advise that light vehicles are serviced off-site as required and no records are kept on site. Maintenance/pre-start inspection records for mobile equipment were not verified. It is noted that the mobile water pump is new and has not required servicing. Stationary plant and equipment that is currently used on site during the care and maintenance period, as observed during the site inspection, includes (but is not limited to): a 75,000L diesel AST and a wastewater collection system. This system comprises a bulk waste oil tank and liquid waste storage facility that is bunded and contained by a catch drain network that leads to an oil/water separator and a 6,000L waste oil collection tank. During the site inspection, the following observations were made by the Auditor: 1. The catch drain system contained (in sections) oily sediment and debris. 2. A break in the PVC pipes that leads from the catch drains to the oil/water separator and waste oil collection tank. Should any spills within the bunded area occur, this would leak onto the soil and vegetation on the embankment. 3. The 6000L waste oil collection tank is not bunded. The wastewater collection system is designed to capture any spills from the current diesel AST refuelling area, the bunded waste oil tank and the liquid waste storage area. As such it is required to be maintained in proper and efficient working condition during the care and maintenance period.	Undertake maintenance and cleaning of the wastewater catch drain system. Conduct a maintenance inspection and integrity test of the wastewater collection system including bunding, tanks and piping. Repair the breakage in the piping that leads from the wastewater catch drain to the oil/water separator and waste oil collection tank. Investigate whether any soil contamination has resulted from the breakage. Install bunding around the waste oil collection tank (if it is to remain operational). Retain maintenance and servicing records for all plant and equipment used at the site.	Castlereagh Coal	The following items are included in the current inspection/ maintenance program. However, there is currently no formal recording of actions for repair/maintenance: • Inspection and maintenance of the catch drain system. • Inspection and maintenance of the wastewater collection system. • Plant and equipment maintenance and servicing. A new Inspection Checklist has been prepared to allow recording of repairs/maintenance and corrective actions required and this checklist is currently being used during routine inspections conducted by the Mining Engineering Manager. The waste oil collection system is currently not in use. However, repairs to the catch drain pipework will be undertaken as required. The wastewater collection system is now assessed during routine inspections. There is no evidence of leakage/spillage or contamination in this area and the system will continue to be monitored on a regular basis. The waste oil collection system is currently not in use. If this system is proposed to be used in future, bunding will be installed prior to use. The UST tank is empty and is not currently used. However, it may be used again once operations recommence so will not be decommissioned. The tank and associated pipework will be tested prior to recommissioning. **2016 – Annual Review Update** No further action required as waste oil system is not utilised. A risk assessment regarding the utilisation of the system will be undertaken prior to the system being recommissioned. **2017 – Annual Review Update.** The waste oil system was not utilised during the 2017 report period. A risk assessment regarding the utilisation of the system will be undertaken prior to the system being recommissioned. The waste oil collection system will be reinstated prior to recommencing mining. **2018 – Annual Review Update.** The waste oil system was not utilised during the 2018 report period. A risk assessment regarding the utilisation of the system will be undertaken prior to the system being recommissioned. The waste oil collection system will be reinstated prior to recommencing mining. **2019 – Annual Review Update.** The waste oil system was not utilised during the 2019 report period. A risk assessment regarding the utilisation of the system will be undertaken prior to the system being recommissioned. The waste oil collection system will be reinstated prior to recommencing mining. **2020 – Annual Review Update.** The waste oil system was not utilised during the 2020 report period. A risk assessment regarding the utilisation of the system will be undertaken prior to the system being recommissioned. The waste oil collection system will be reinstated prior to recommencing mining. **2021 – Annual Review Update.** The waste oil system was not utilised during the 2021 report period. A risk assessment regarding the utilisation of the system will be undertaken prior to the system being recommissioned. The waste oil collection system will be reinstated prior to recommencing mining. **2022 – Annual Review Update.** The waste oil system was not utilised during the 2022 report period. A risk assessment regarding the utilisation of the system will be undertaken prior to the system being recommissioned. The waste oil collection system will be reinstated prior to recommencing mining.	Active

ID	Criteria	Requirement	Audit Finding	Audit Recommendation	Responsibility (assigned by auditor)	Follow up Actions and Current Status	Status
NC6 **Med**	PA 07_0127, S3, C12	Except as may be expressly provided for by an EPL, or in accordance with section 120 of the *Protection of the Environment Operations Act 1997*, (POEO Act) the Proponent shall not discharge any mine water from the site.	The EPL permits wet weather discharge from the overflow point located at the water storage dam below the washery and labelled as Discharge Point #2 on plan titled 'Invincible Open Cut Environmental Monitoring Sites' dated 29 June 2001. A copy of the plan was not available at the time of the audit and is required to verify the location as per this figure; however the description appears to match the discharge location used. It was reported during site interviews, that dirty water storage dams are utilised during heavy rainfall events, these are the Sump Dam (SDC3-7) and Crib Hut Dam (SD-C3-6, now SD4). All water captured in these two dams is either pumped or drains into the underground workings or is reused on site when required. This is approved in the Care and Maintenance Mining Operations Plan (2013) but is not expressly provided for within the EPL. Consultation with the Department of Primary Industries - Water also indicated that the site needs to consider the Aquifer Interference Policy for all surface water movement activities.	Review the current operations against the Aquifer Interference Policy. Apply to the EPA for a modification of the Environment Protection Licence to permit discharge via the underground workings.	Coalpac	Mine water is not discharged from the site except from the licenced discharge location at the Main Dam (LD002) and only when water quality is in accordance with EPL criteria. EPA has advised that discharge of groundwater from old underground workings (LD001) was previously approved under the EPL at a rate of 2ML/day but was removed in 2012 due to concerns with groundwater quality and volumes and the potential impacts on Cox's River and Long Swamp. At that time, the pump was removed from LD001 and no discharge currently occurs from this location. While water is pumped from Sediment Dam 2 to Sediment Dam 4, which drains to the old underground workings, there is no discharge from the underground workings. **2016 – Annual Review Update** No further action required. **2017 – Annual Review Update** No further action required. **2018 – Annual Review Update** A revised water management plan for the site was submitted to the EPA and DPI Water during the 2018 report period and will be completed during the 2019 report period. **2019 – Annual Review Update** A revised water management plan for the site was submitted to the EPA and DPI Water during the 2018 report period and will be completed prior to the recommencement of operations. The EPA and DPI Water are yet to provide comments on the draft management plans. **2020 – Annual Review Update** A revised water management plan for the site was submitted to the EPA and DPI Water during the 2018 report period and will be completed prior to the recommencement of operations. The EPA and DPI Water are yet to provide comments on the draft management plans. **2021 – Annual Review Update** A revised water management plan for the site was submitted to the EPA and DPI Water during the 2018 report period and will be completed prior to the recommencement of operations. The EPA and DPI Water are yet to provide comments on the draft management plans. **2022 – Annual Review Update.** An updated water management plan (WMP) was approved in November 2022 following extensive stakeholder and agency consultation. The WMP addresses requirements associated with water storage and licencing. The Invincible Environment Protection Licence was subsequently varied in consultation with the EPA in March 2023.	Active

NC7 **Med**	PA 07_0127, S3, C13(c)(ii)	Water Management Plan (WMP) This Plan must include an erosion and sediment control plan for all surface works in the mining area that is consistent with the requirements of Managing Urban Stormwater: Soils and Construction Manual (Landcom 2004, or its latest version);	Section 8 of the WMP (2009) provides an Erosion and Sediment Control Plan. Erosion was observed on site during the site inspection and has been noted by others during recent inspections of the rehabilitation areas (Kleinfelder, 2015), indicating that review and maintenance of controls is required.	Update the Erosion and Sediment Control Plan with reference to the latest guidelines for Managing Urban Stormwater: Soils and Construction, Volume 2E Mines and Quarries (Blue Book).	Coalpac	Erosion and sediment control rectification works are currently being conducted by Sedgman Civil Engineers. Proposed timeframe for update of the ESCP: 31 January 2017. The Stage 1 erosion control design has been completed and a new ESCP will be provided by the end of June 2017. **2016 – Annual Review Update** A review of the proposed design, including determination of whether any interim works can be undertaken will be completed by June 2017. **2017 – Annual Review Update** Management Plans will be updated during 2018 to incorporate the Southern Extension Project Area and Project Approval conditions. **2018 – Annual Review Update** A revised water management plan for the site was submitted to the EPA and DPI Water during the 2018 report period and will be completed during the 2019 report period. **2019 – Annual Review Update** A revised water management plan for the site was submitted to the EPA and DPI Water during the 2018 report period and will be completed prior to the recommencement of operations. The EPA and DPI Water are yet to provide comments on the draft management plans. **2020 – Annual Review Update** A revised water management plan for the site was submitted to the EPA and DPI Water during the 2018 report period and will be completed prior to the recommencement of operations. The EPA and DPI Water are yet to provide comments on the draft management plans. **2021 – Annual Review Update** A revised water management plan for the site was submitted to the EPA and DPI Water during the 2018 report period and will be completed prior to the recommencement of operations. The EPA and DPI Water are yet to provide comments on the draft management plans. **2022 - Annual Review Update** An updated water management plan (WMP) was approved in November 2022 following extensive stakeholder and agency consultation. The WMP addresses requirements associated with erosion and sediment control plans.	Active

ID	Criteria	Requirement	Audit Finding	Audit Recommendation	Responsibility (assigned by auditor)	Follow up Actions and Current Status	Status
NC8 Low	PA 07_0127, S3, C13(c)(iv)	This Plan must include a groundwater monitoring program with: - baseline data of groundwater levels and quality in the region, including details of any privately-owned groundwater bores which could be affected by the development; - groundwater impact assessment criteria, including trigger levels for investigating any potentially adverse groundwater impacts of the development; and - a program to monitor: - groundwater inflows to the open cut mining operations; & - impacts of the development on the region's aquifers, groundwater bores and surrounding watercourses	Section 10 of the WMP (2009) references a Groundwater Monitoring Program. The plan includes baseline data, groundwater impact assessment criteria and trigger levels; however it lacks a detailed monitoring program to assess groundwater inflows to the open cut mining operations or impacts of the development on the regions water resources. The 2014 and 2015 AEMRs indicate that groundwater monitoring is undertaken from up and downgradient wells, however this monitoring is not detailed in the WMP.	Update the WMP to include a groundwater monitoring program that satisfies the requirements of the Project Approval.	Coalpac	6 rounds of groundwater monitoring have previously been conducted since 2011 and a 7th round was conducted in November 2015 by RCA Environmental. The groundwater monitoring has been undertaken to provide a baseline dataset to assess the impact of mining operations on groundwater resources. The groundwater water monitoring program and results are described in RCAs *Invincible Colliery Groundwater Monitoring Report November 2015*. The WMP will be updated to include the groundwater monitoring program as part of the project approval process for future mining operations as agreed with DPE. Update of the WMP will be undertaken as part of the proposed expansion project. **2016 – Annual Review Update** No further action proposed. **2017 – Annual Review Update** Management Plans will be updated during 2018 to incorporate the Southern Extension Project Area and Project Approval conditions. **2018 – Annual Review Update** A revised water management plan for the site was submitted to the EPA and DPI Water during the 2018 report period and will be completed during the 2019 report period. **2019 – Annual Review Update** A revised water management plan for the site was submitted to the EPA and DPI Water during the 2018 report period and will be completed prior to the recommencement of operations. The EPA and DPI Water are yet to provide comments on the draft management plans. **2021 – Annual Review Update** A revised water management plan for the site was submitted to the EPA and DPI Water during the 2018 report period and will be completed prior to the recommencement of operations. The EPA and DPI Water are yet to provide comments on the draft management plans. **2022 – Annual Review Update** An updated water management plan (WMP) was approved in November 2022 following extensive stakeholder and agency consultation. The WMP addresses requirements associated with groundwater monitoring.	Active

NC11 Low	PA 07_0127, S3, C32	Biodiversity Offsets Within 2 years of the date of this approval, the Proponent shall provide appropriate long term security for the biodiversity offset strategy (BOS), to the satisfaction of the Director-General. Note: The long-term security of the offset can be achieved through one, or a combination, of the following: Deed of Agreement with the Minister, rezoning the land under the Lithgow Local Environment Plan, caveats on the title under the *Conveyancing Act 1919*, etc.	Evidence of the provision of appropriate long-term security for the BOS was not provided by Sedgman or CC.	It is recommended that the leaseholder provide appropriate security for the BOS such as rezoning of Lot 112 DP877190, Lot 113 DP 877190 and Lot 1 DP180294 or the application of a protective covenant (such as a Section 88B Covenant) on title. Consult with the DPE.	Coalpac	Preparation of the BOS and establishment of a security pre-dates CC's involvement in the project and we are unable to confirm whether a security has been provided. Provision of a long-term security for the BOS will be addressed as part of the proposed expansion project. **2016 – Annual Review Update** No further works proposed as provision of a long-term security for the BOS will be addressed as part of the proposed expansion project. **2017 – Annual Review Update** The timing requirements of this condition have been revised in the current project approval (i.e. Z" Within 2 years of the recommencement of mining operations, unless the Secretary agrees otherwise, "These works will be progressed during 2018 – 2019. **2018 – Annual Review Update** The timing requirements of this condition have been revised in the current project approval (i.e. " Within 2 years of the recommencement of mining operations, unless the Secretary agrees otherwise…") These works will be progressed during the 2019 report period. **2019 – Annual Review Update** The timing requirements of this condition have been revised in the current project approval (i.e. " Within 2 years of the recommencement of mining operations, unless the Secretary agrees otherwise…") These works will be completed prior to the recommencement of operations. **2020 – Annual Review Update** The timing requirements of this condition have been revised in the current project approval (i.e. " Within 2 years of the recommencement of mining operations, unless the Secretary agrees otherwise…") These works will be completed prior to the recommencement of operations. **2021 – Annual Review Update** The timing requirements of this condition have been revised in the current project approval (i.e. " Within 2 years of the recommencement of mining operations, unless the Secretary agrees otherwise…") These works will be completed prior to the recommencement of operations. **2022 – Annual Review Update** The Invincible Colliery Biodiversity Management Plan (BMP) is undergoing further consultation with BCD prior to finalising. The BMP addresses the revised Southern Extension Biodiversity Offset Strategy and related security mechanism.	Active

ID	Criteria	Requirement	Audit Finding	Audit Recommendation	Responsibility (assigned by auditor)	Follow up Actions and Current Status	Status
NC12 Low		The Proponent shall progressively rehabilitate the site in a manner that is generally consistent with the final landform set out in the EA (shown conceptually in Figure 5 of Appendix 1) to the satisfaction of the Director-General and I&I NSW.	Progressive rehabilitation of the site has generally been consistent with the final landform set out in the EA. Although the maximum slope has been exceeded in some areas of rehab, particularly the 2012 seeded areas. This has resulted in top soil loss and erosion, in parts, and the failed establishment of native vegetation, seeded as part of rehabilitation measures (aerial seeding in particular) in the north-western portion of the site. Although there has been no new rehabilitation areas established by CC and rehabilitation performance is assessed annually, re-evaluation of the establishment of failed rehabilitation areas, particularly on steep slopes is required.	Whilst no new rehabilitation has been established during CC operations and rehabilitation performance is assessed annually, it is recommended that CC review Rehabilitation progress and performance, including the establishment of failed rehabilitation areas on steep slopes. Any recommendations from the annual review process should be reflected in future rehabilitation plans.	Castlereagh Coal	Annual biodiversity monitoring was conducted within rehabilitation areas in December 2015 and December 2016 and recommendations are being implemented by CC. Areas of failed rehabilitation and erosion in rehabilitation areas are currently being monitored and will be reseeded as required as part of the ongoing care and maintenance activities. **2016 – Annual Review Update** Annual biodiversity monitoring undertaken during 2016. Erosion and sediment control on site to be reviewed in accordance with item NC7. **2017 – Annual Review Update** Annual biodiversity monitoring undertaken during 2017 and reported in the Annual Review. Erosion and sediment control on site to be reviewed in accordance with item NC7. CC notes that a Rehabilitation Management Plan required under Schedule 3 Condition 52 requires a detailed rehabilitation schedule and performance assessment aspects. The Rehabilitation Management Plan will be submitted during 2018. **2018 – Annual Review Update** A Rehabilitation Strategy, revised Biodiversity Management Plan, and a revised Rehabilitation Management Plan were submitted to regulatory authorities in 2018 for comment. These revised plans will be submitted to DPE during 2019. Annual biodiversity and rehabilitation monitoring was also undertaken during 2018. **2019 – Annual Review Update** A Rehabilitation Strategy, revised Biodiversity Management Plan, and a revised Rehabilitation Management Plan were submitted to regulatory authorities in 2018 for comment. These revised plans will be submitted prior to the recommencement of operations. Annual biodiversity and rehabilitation monitoring was also undertaken during 2019 and is discussed in the Annual Review. **2020 – Annual Review Update** A Rehabilitation Strategy, revised Biodiversity Management Plan, and a revised Rehabilitation Management Plan were submitted to regulatory authorities in 2018 for comment. These revised plans will be submitted prior to the recommencement of operations. Annual biodiversity and rehabilitation monitoring was also undertaken during 2020 and is discussed in the Annual Review. **2021 – Annual Review Update** A Rehabilitation Strategy, revised Biodiversity Management Plan, and a revised Rehabilitation Management Plan were submitted to regulatory authorities in 2018 for comment. These revised plans will be submitted prior to the recommencement of operations. Annual biodiversity and rehabilitation monitoring was also undertaken during 2021 and is discussed in the Annual Review. **2022 – Annual Review Update** The Invincible rehabilitation strategy was approved in December 2022 following extensive stakeholder and agency consultation. The Invincible Colliery Biodiversity Management Plan (BMP) is undergoing further consultation with BCD prior to finalising. Annual Biodiversity and Rehabilitation monitoring and an Erosion and Sediment Control (Physical Landform) Assessment was undertaken at the end of the 2022 reporting period and is discussed in the Annual Review.	Active

ID	Criteria	Requirement	Audit Finding	Audit Recommendation	Responsibility (assigned by auditor)	Follow up Actions and Current Status	Status
NC13 Med	PA 07_0127, S3, C34(a)	The Proponent shall prepare and implement a detailed Landscape Management Plan for the site to the satisfaction of the Director-General and I&I NSW. This plan must: (a) be prepared in consultation with Lithgow City Council (LCC) and NOW by suitably qualified expert/s whose appointment/s have been approved by the Director-General;	A Landscape Management Plan (LMP), dated June 2009 was reviewed. Section 1.2 of the plan indicates that it was prepared in consultation with LCC and NOW as required by this condition. Records were not available to verify this condition has been met. The plan states that it was developed in consultation variously between relevant mine personnel, Global Soil Systems (GSS) and LCC and DWE. Records showing the approved appointment of GSS by the DPE were not available to verify this condition. Site inspection confirmed that the LMP was not implemented according with all criteria set out in the plan. In particular with regard to planting in the BOS, successful establishment of progressive rehabilitation areas, and the annual monitoring of each new area of rehabilitation.	Ensure the LCC and the DPI-Water is consulted during any future revisions to the WMP, and evidence of consultation is retained. Implement the LMP in terms of achieving performance criteria for rehabilitation, and following recommendations from Annual Flora, Fauna and Rehabilitation Monitoring.	Castlereagh Coal	The LMP was prepared and approved by the Director-General during Coalpac ownership of the mine and pre-dates CC's involvement in the project. Any future revisions of the management plans will be undertaken in consultation with relevant regulatory agencies (as required). Update of management plans will be undertaken as part of the proposed expansion project. The annual biodiversity monitoring conducted by Kleinfelder includes assessment against the performance criteria contained in the development stage section of the LMP Assessment Checklist (Appendix 2) including vegetation establishment and sustainability, fauna habitat and recolonization, landform stability and soil suitability. However, they do not provide a completed Assessment Checklist as contained in the LMP Appendix 2. Further annual biodiversity monitoring was conducted by Umwelt in December 2016 and included assessment against the relevant sections of the LMP Checklist. **2016 – Annual Review Update** Annual biodiversity monitoring conducted during 2016 with results included within the 2016 Annual Review (refer to **Section 8.3**). Any updates made to management plans in the future will be undertaken in accordance with relevant stakeholders as defined by statutory approvals. **2017 – Annual Review Update** This condition (i.e. S3, C34(a)) has been removed from the Project Approval. CC notes that a Rehabilitation Management Plan required under Schedule 3 Condition 52 must be prepared in consultation with DPI Water, OEH, Council and CCC. The Rehabilitation Management Plan will be submitted during 2018. **2018 – Annual Review Update** A revised Rehabilitation Management Plan was submitted to agencies for comment during 2018 and will be finalised during the 2019 Report Period. **2019 – Annual Review Update** A revised Rehabilitation Management Plan was submitted to agencies for comment during 2018 and will be finalised prior to the recommencement of operations. The status of all management plans is detailed in the Annual Review. **2020 – Annual Review Update** A revised Rehabilitation Management Plan was submitted to agencies for comment during 2018 and will be finalised prior to the recommencement of operations. The status of all management plans is detailed in the Annual Review. **2021 – Annual Review Update** A revised Rehabilitation Management Plan was submitted to agencies for comment during 2018 and will be finalised prior to the recommencement of operations. The status of all management plans is detailed in the Annual Review. **2022 – Annual Review Update** An updated water management plan (WMP) was approved in November 2022 following extensive stakeholder and agency consultation. The WMP addresses requirements associated with groundwater monitoring. The Invincible rehabilitation strategy was approved in December 2022 following extensive stakeholder and agency consultation. The Invincible Colliery Biodiversity Management Plan (BMP) is undergoing further consultation with BCD prior to finalising. The BMP replaces an independent Landscape Management Plan.	Active

ID	Criteria	Requirement	Audit Finding	Audit Recommendation	Responsibility (assigned by auditor)	Follow up Actions and Current Status	Status
NC16 Low	PA 07_0127, S3, C37	Biodiversity Offset Strategy (BOS) Implementation Bond Within 3 months of the approval of the LMP, the Proponent shall lodge a BOS implementation bond with either the I&I NSW or the DPE to ensure that the BOS is implemented in accordance with the performance and completion criteria of the LMP. The sum of the bond shall reflect the full cost of implementing the BOS and be determined by employing a suitably qualified rehabilitation expert or quantity surveyor. Notes: • If the BOS is implemented to the satisfaction of the Director-General and I&I NSW, then the bond holder will release the implementation bond. • If the BOS is not implemented to the satisfaction of the Director-General and I&I NSW, then all or part of the bond may be used to ensure the satisfactory completion of the relevant works. • The bond may be incorporated into rehabilitation bonding arrangements under the *Mining Act 1992*.	Evidence of the BOS Implementation Bond was not provided by Sedgman or CC	Evidence of the BOS Implementation Bond was not available. Consult with DPE and DRE and provide evidence of BOS Implementation Bond, or evidence of DG sign-off on the implementation of the BOS.	Coalpac	This security was required to be paid in 2009 during Coalpac ownership; however we are unable to find records of this payment. We have been advised that neither DPE nor DRE have any records of this implementation bond being paid by Coalpac. It is expected that this issue will be resolved as part of the assessment being undertaken for the Invincible Southern Expansion Project. **2016 – Annual Review Update** No further action proposed until a determination is made in regards to the IEP. **2017 – Annual Review Update** This condition (i.e. S3, C37) has been removed from the Project Approval. CC notes that a Conservation Bond must be lodged with the Department within 6 months of the approval of the Biodiversity Management Plan required under Schedule 3 Condition 35 of the Project Approval (as modified). The Biodiversity Management Plan will be submitted during 2018 – 2019 in accordance with this condition. **2018 – Annual Review Update** A revised Biodiversity Management Plan was submitted to agencies for comment during 2018 and will be finalised during the 2019 report period. Following the approval of the management plan, a Conservation Bond will be established in accordance with the requirements of the Project Approval. **2019 – Annual Review Update** A revised Biodiversity Management Plan was submitted to agencies for comment during 2018 and will be finalised prior to the recommencement of operations. Following the approval of the management plan, a Conservation Bond will be established in accordance with the requirements of the Project Approval. **2020 – Annual Review Update** A revised Biodiversity Management Plan was submitted to agencies for comment during 2018 and will be finalised prior to the recommencement of operations. Following the approval of the management plan, a Conservation Bond will be established in accordance with the requirements of the Project Approval. **2021 – Annual Review Update** A revised Biodiversity Management Plan was submitted to agencies for comment during 2018 and will be finalised prior to the recommencement of operations. Following the approval of the management plan, a Conservation Bond will be established in accordance with the requirements of the Project Approval. **2022 – Annual Review Update** The Invincible Colliery Biodiversity Management Plan (BMP) is undergoing further consultation with BCD prior to finalising. The BMP addresses the revised Southern Extension Biodiversity Offset Strategy and related security mechanism.	Active

NC17 Low	PA07_012 7,S3, C40 (a)	Aboriginal Heritage Management Plan (AHMP) The Proponent shall prepare and implement an AHMP for the project to the satisfaction of the Director-General. The Plan must: (a) be prepared in consultation with DECCW and the Aboriginal community;	Verifiable evidence of consultation with DECCW (now NSW OEH) or the Aboriginal Community was not reviewed as the current mine operators' access to these records is limited. The AHMP states that consultation with the Bathurst Local Aboriginal Land Council was made by phone and that they agreed with the conditions of the Project Approval and those detailed within the plan, in terms of its provisions for site material should any such material be found during the course of the project. The AHMP (June 2009) requires 'Invincible OS1' to be fenced and sign posted (Warning and Notice signs). During the site inspection, the Auditor observed: - a fence around the heritage site "Invincible OS1"; however no signage was visible. - maps showing the location of the heritage site on the noticeboard at the main office. It was reported that signage had been installed, but was not visible to the auditor during the audit.	Ensure the EPA and the Aboriginal Community is consulted during any future revisions to the AHMP, and evidence of consultation is retained. Re-erect the signs at the 'Invincible OS1' Aboriginal heritage site as outlined in the AHMP (i.e. Warning and Notice signs). Update plans in all management documents to include the location of the cultural heritage site "Invincible OS1".	Castlereagh Coal	The AHMP prepared by Coalpac states that consultation was made with the DECC and the BLALC. Contact details for BLALC are provided in Appendix 1 and correspondence from BLALC is provided in Appendix 2. Any future review of the AHMP by CC would be conducted in consultation with relevant regulatory authorities and Aboriginal parties. There are eight signs in total at the OS1 site (many of which the audit team would not have seen as they are not visible from a distance and the audit team did not go right down to the site). However many of the signs had fallen off the fence and were therefore not visible from a distance. These signs have now been reattached and all signs are visible. No further action required. **2018– Annual Review Update** An Aboriginal Cultural Heritage Management Plan (ACHMP) was submitted to Aboriginal Stakeholders during 2018 and will be updated to address stakeholder comment and be submitted to OEH for comment in 2019. **2019 – Annual Review Update** An Aboriginal Cultural Heritage Management Plan (ACHMP) was submitted to Aboriginal Stakeholders during 2018 and will be updated to address stakeholder comment and be submitted to OEH for comment and finalised prior to the recommencement of operations. **2020 – Annual Review Update** An Aboriginal Cultural Heritage Management Plan (ACHMP) was submitted to Aboriginal Stakeholders during 2018 and will be updated to address stakeholder comment and be submitted to OEH for comment and finalised prior to the recommencement of operations. **2021 – Annual Review Update** An Aboriginal Cultural Heritage Management Plan (ACHMP) was submitted to Aboriginal Stakeholders during 2018 and will be updated to address stakeholder comment and be submitted to OEH for comment and finalised prior to the recommencement of operations. **2022 – Annual Review Update** An updated Aboriginal Heritage Management Plan (ACHMP) (WMP) was approved in January 2023 following extensive stakeholder and agency consultation. The ACHMP addresses requirements outstanding actions.	Active

ID	Criteria	Requirement	Audit Finding	Audit Recommendation	Responsibility (assigned by auditor)	Follow up Actions and Current Status	Status
NC21 Admin	PA 07_0127, S5, C1(e)	Environmental Management Strategy (EMS) This strategy must (e) include environmental monitoring program for the project that includes all the monitoring requirements of this approval;	Section 12 of the EMS states that Environmental Monitoring Programs have been prepared pursuant to Schedule 3, Condition 6, 10, 13 and 30 of PA 07_0127. This relates to noise, air, water and blast monitoring only and does not include the requirement to monitor waste generation (Schedule 3, Condition 43), rehabilitation (Schedule 3, Condition 35), greenhouse and energy efficiency (Schedule 3, Condition 42), coal transport etc. Section 12 states that the included monitoring plans have been consolidated into a single document as described within Appendix 2 - However, the plans included in Appendix 2 of the EMS could not be verified as Appendix 2 is not attached to the EMS (on the CC website). An Environmental Monitoring Program (Coalpac, 2009) is provided on the CC website. This plan states that it has been developed as required by Schedule 5, Condition 1 (e), however, the date of this report (December 2009) does not indicate that it is the Appendix 2 of the EMS (November 2009).	Inclusion of the current Environmental Monitoring Program within the EMS is required to meet the conditions of the Project Approval. A full copy of the EMS should be uploaded to the website and the EMS should be updated to reference the EMP (ensuring also that the EMP is reviewed for relevancy).	Castlereagh Coal	A link to the Coalpac website is provided on the CC website for access to 'historic documents'. Appendix 2 (Environmental Monitoring Program) was not attached to the pdf of the EMS on the Coalpac website but the Environmental Monitoring Program was included separately on the website. This Environmental Monitoring Program includes programs for waste monitoring (Section 9), rehabilitation (Section 8), greenhouse gases (Section 10), and coal transport (Section 11). Appendix 2 was added to the pdf of the EMS and the complete EMS document has now been uploaded to the CC website **2016 – Annual Review Update** No further action required. **2018 – Annual Review Update** A revised Environmental Management Strategy for Invincible Colliery will be submitted to DPE during 2019. **2019 – Annual Review Update** A revised Environmental Management Strategy for Invincible Colliery will be submitted to DPI prior to the recommencement of operations. **2020 – Annual Review Update** A revised Environmental Management Strategy for Invincible Colliery will be submitted to DPI prior to the recommencement of operations. **2021 – Annual Review Update** A revised Environmental Management Strategy for Invincible Colliery will be submitted to DPI prior to the recommencement of operations. **2022 – Annual review Update** An updated Environmental Monitoring Strategy (EMS) was approved in November 2022 following extensive stakeholder and agency consultation meeting the conditions of project approval.	Active

ID	Criteria	Requirement	Audit Finding	Audit Recommendation	Responsibility (assigned by auditor)	Follow up Actions and Current Status	Status
NC27 Med	SOC, C3.4	Store waste oils and grease at the maintenance workshop for collection by a licensed waste recycling contractor (Bi-monthly)	Waste oils and grease are stored within drums in the maintenance workshop. The 2015 AEMR states that waste oils and grease from workshop areas is collected in the waste oil storage tank. The above ground waste oil tank is located in bunding near the mechanical servicing area. A number of other chemical storage containers are located within this bunded area. A catch drain is adjacent to the waste oil tank to capture any material in the unlikely event that waste oil or other chemicals are spilled. This drain leads to an oil/water separator and a 6,000L waste oil collection tank. The 2015 AEMR reports that minor servicing may be undertaken on site using this infrastructure however maintenance records or liquid waste disposal records were not sighted. During the site inspection, a number of observations were recorded as follows: 1. The catch drain system was (in sections) filled with oily sediment and debris and as the area is still in use for chemical storage, it requires cleaning and maintenance. 2. A break in the PVC pipes that leads from the catch drains to the oil/water separator and waste oil tank was observed. Should any spills within the bunded area occur, this would leak onto the soil and vegetation on the embankment. The piping needs repair and the integrity of the system requires testing. 3. The waste oil collection tank is not bunded. 4. Liquid waste/product containers stored within the workshop are not bunded.	Ensure all liquid waste containers are stored within secondary containment / in bunding. • Undertake maintenance and cleaning of the wastewater catch drain system. • Retain all records of maintenance of equipment for a period of 7 years. • Retain all records of waste disposal for a period of 7 years. • Install bunding around the waste oil collection tank (if it is to remain operational). • Repair the PVC pipe in the waste oil collection system and investigate any residual contamination. • Conduct a maintenance inspection and integrity test of the waste oil collection system tanks and piping.	Castlereagh Coal	The following items are included in the current inspection/ maintenance program. However, there is currently no formal recording of actions for repair/maintenance: • Inspection and maintenance of the catch drain system. • Inspection and maintenance of the wastewater collection system. • Plant and equipment maintenance and servicing. A new Inspection Checklist has been prepared to allow recording of repairs/maintenance and corrective actions required and this checklist is currently being used during routine inspections conducted by the Mining Engineering Manager. The waste oil collection system is currently not in use. However, repairs to the catch drain pipework will be undertaken as required. The wastewater collection system is now assessed during routine inspections. There is no evidence of leakage/spillage or contamination in this area and the system will continue to be monitored on a regular basis. The waste oil collection system is currently not in use. If this system is proposed to be used in future, bunding will be installed prior to use. The UST tank is empty and is not currently used. However, it may be used again once operations recommence so will not be decommissioned. The tank and associated pipework will be tested prior to recommissioning. **2016 – Annual Review Update** No further action required as waste oil system is not utilised. A risk assessment regarding the utilisation of the system will be undertaken prior to the system being recommissioned. **2017 – Annual Review Update** The waste oil system was not utilised during the 2017 report period. A risk assessment regarding the utilisation of the system will be undertaken prior to the system being recommissioned. The waste oil collection system will be reinstated prior to recommencing mining. **2018 – Annual Review Update** The waste oil system was not utilised during the 2018 report period. A risk assessment regarding the utilisation of the system will be undertaken prior to the system being recommissioned. The waste oil collection system will be reinstated prior to recommencing mining. **2019 – Annual Review Update** The waste oil system was not utilised during the 2019 report period. A risk assessment regarding the utilisation of the system will be undertaken prior to the system being recommissioned. The waste oil collection system will be reinstated prior to recommencing mining. **2020 – Annual Review Update** The waste oil system was not utilised during the 2020 report period. A risk assessment regarding the utilisation of the system will be undertaken prior to the system being recommissioned. The waste oil collection system will be reinstated prior to recommencing mining. **2021 – Annual Review Update** The waste oil system was not utilised during the 2021 report period. A risk assessment regarding the utilisation of the system will be undertaken prior to the system being recommissioned. The waste oil collection system will be reinstated prior to recommencing mining. **2022 – Annual Review Update** The waste oil system was not utilised during the 2022 report period. A risk assessment regarding the utilisation of the system will be undertaken prior to the system being recommissioned. The waste oil collection system will be reinstated prior to recommencing mining.	Active

ID	Criteria	Requirement	Audit Finding	Audit Recommendation	Responsibility (assigned by auditor)	Follow up Actions and Current Status	Status
NC28 Med	SOC, C3.6	Store hydrocarbon contaminated water in the oil/water separator for regular removal from site by a licensed contractor (as required).	See Item 3.3 and 3.4 above. Disposal receipts for the regular removal of liquid wastes is not recorded and the infrastructure to store the liquid waste is in need of repair.	See recommendations for 3.3 and 3.4 above.	Castlereagh Coal	The following items are included in the current inspection/ maintenance program. However, there is currently no formal recording of actions for repair/maintenance: • Inspection and maintenance of the catch drain system. • Inspection and maintenance of the wastewater collection system. • Plant and equipment maintenance and servicing. A new Inspection Checklist has been prepared to allow recording of repairs/maintenance and corrective actions required and this checklist is currently being used during routine inspections conducted by the Mining Engineering Manager. The waste oil collection system is currently not in use. However, repairs to the catch drain pipework will be undertaken as required. The wastewater collection system is now assessed during routine inspections. There is no evidence of leakage/spillage or contamination in this area and the system will continue to be monitored on a regular basis. The waste oil collection system is currently not in use. If this system is proposed to be used in future, bunding will be installed prior to use. The UST tank is empty and is not currently used. However, it may be used again once operations recommence so will not be decommissioned. The tank and associated pipework will be tested prior to recommissioning. **2016 – Annual Review Update** No further action required as waste oil system is not utilised. A risk assessment regarding the utilisation of the system will be undertaken prior to the system being recommissioned. **2017 – Annual Review Update** The waste oil system was not utilised during the 2017 report period. A risk assessment regarding the utilisation of the system will be undertaken prior to the system being recommissioned. The waste oil collection system will be reinstated prior to recommencing mining. **2018 – Annual Review Update** The waste oil system was not utilised during the 2018 report period. A risk assessment regarding the utilisation of the system will be undertaken prior to the system being recommissioned. The waste oil collection system will be reinstated prior to recommencing mining. **2019 – Annual Review Update** The waste oil system was not utilised during the 2019 report period. A risk assessment regarding the utilisation of the system will be undertaken prior to the system being recommissioned. The waste oil collection system will be reinstated prior to recommencing mining. **2020 – Annual Review Update** The waste oil system was not utilised during the 2020 report period. A risk assessment regarding the utilisation of the system will be undertaken prior to the system being recommissioned. The waste oil collection system will be reinstated prior to recommencing mining. **2021 – Annual Review Update** The waste oil system was not utilised during the 2021 report period. A risk assessment regarding the utilisation of the system will be undertaken prior to the system being recommissioned. The waste oil collection system will be reinstated prior to recommencing mining. **2022 – Annual Review Update** The waste oil system was not utilised during the 2022 report period. A risk assessment regarding the utilisation of the system will be undertaken prior to the system being recommissioned. The waste oil collection system will be reinstated prior to recommencing mining.	Active

ID	Criteria	Requirement	Audit Finding	Audit Recommendation	Responsibility (assigned by auditor)	Follow up Actions and Current Status	Status
NC33 Med	SOC, C8.1	Construct a fence around the site “Invincible OS1” and identify this as a culturally sensitive area at the site and on all mine plans (prior to commencement of the project).	The AHMP (June 2009) requires 'Invincible OS1' to be fenced and sign posted (Warning and Notice signs). During the site inspection, the Auditor observed: - a fence around the heritage site "Invincible OS1"; however no signage was visible. - maps showing the location of the heritage site on the noticeboard at the main office. It was reported that signage had been installed, but was not visible to the auditor during the audit. A review of monitoring and management plans indicated that the location of the heritage site is not identified on all mine plans. For example, the 2013 MOP does not include the site on plans 1, 2A, 3, 4A. The AHMP does not include the site's location on the overall mine site layout on Figure 2.	Update plans in all management documents to include the location of the cultural heritage site "Invincible OS1". Re-erect signs on the fencing at the 'Invincible OS1' Aboriginal heritage site as outlined in the Aboriginal Heritage Management Plan (i.e. Warning and Notice signs).	Castlereagh Coal	There are eight signs in total around the fencing of OS1 (most of which the audit team would not have seen as they are not visible from a distance and the audit team did not go right down to the site). However many of these signs had fallen off the fence and were not visible. These signs have now been reattached. No further action required **2018 – Annual Review Update** No further action required. Noted that a revised ACHMP will be prepared during the 2019 report period. **2019 – Annual Review Update** No further action required. Noted that a revised ACHMP will be prepared prior to the recommencement of operations. **2020 – Annual Review Update** No further action required. Noted that a revised ACHMP will be prepared prior to the recommencement of operations. **2021 – Annual Review Update** No further action required. Noted that a revised ACHMP will be prepared prior to the recommencement of operations. **2022 – Annual Review Update** An updated Aboriginal Heritage Management Plan (ACHMP) (WMP) was approved in January 2023 following extensive stakeholder and agency consultation. The ACHMP addresses requirements outstanding actions.	Active

ID	Criteria	Requirement	Audit Finding	Audit Recommendation	Responsibility (assigned by auditor)	Follow up Actions and Current Status	Status
NC43 Med	SOC, C9.17	Direct all water from wash-down areas and workshops to oil/water separators and containment systems (ongoing).	Wash down areas and workshops drain to a catch drain system that leads to an oil/water separator and a 6000L waste oil collection tank. During the site inspection, maintenance and integrity issues were identified as outlined in condition 9.18 below. These issues affect the ability of the system to contain wastewater and are required to be addressed.	Refer to actions in NC 44 below.	Castlereagh Coal	The following items are included in the current inspection/ maintenance program. However, there is currently no formal recording of actions for repair/maintenance: • Inspection and maintenance of the catch drain system. • Inspection and maintenance of the wastewater collection system. • Plant and equipment maintenance and servicing. A new Inspection Checklist has been prepared to allow recording of repairs/maintenance and corrective actions required and this checklist is currently being used during routine inspections conducted by the Mining Engineering Manager. The waste oil collection system is currently not in use. However, repairs to the catch drain pipework will be undertaken as required. The wastewater collection system is now assessed during routine inspections. There is no evidence of leakage/spillage or contamination in this area and the system will continue to be monitored on a regular basis. The waste oil collection system is currently not in use. If this system is proposed to be used in future, bunding will be installed prior to use. The UST tank is empty and is not currently used. However, it may be used again once operations recommence so will not be decommissioned. The tank and associated pipework will be tested prior to recommissioning. **2016 – Annual Review Update** No further action required as waste oil system is not utilised. A risk assessment regarding the utilisation of the system will be undertaken prior to the system being recommissioned. **2017 – Annual Review Update** The waste oil system was not utilised during the 2017 report period. A risk assessment regarding the utilisation of the system will be undertaken prior to the system being recommissioned. The waste oil collection system will be reinstated prior to recommencing mining. **2018 – Annual Review Update** The waste oil system was not utilised during the 2018 report period. A risk assessment regarding the utilisation of the system will be undertaken prior to the system being recommissioned. The waste oil collection system will be reinstated prior to recommencing mining. **2019 – Annual Review Update** No further action required. The waste oil system was not utilised during the 2019 report period. A risk assessment regarding the utilisation of the system will be undertaken prior to the system being recommissioned. The waste oil collection system will be reinstated prior to recommencing mining. **2020 – Annual Review Update** No further action required. The waste oil system was not utilised during the 2020 report period. A risk assessment regarding the utilisation of the system will be undertaken prior to the system being recommissioned. The waste oil collection system will be reinstated prior to recommencing mining. **2021 – Annual Review Update** No further action required. The waste oil system was not utilised during the 2021 report period. A risk assessment regarding the utilisation of the system will be undertaken prior to the system being recommissioned. The waste oil collection system will be reinstated prior to recommencing mining. **2022 – Annual Review Update** The waste oil system was not utilised during the 2022 report period. A risk assessment regarding the utilisation of the system will be undertaken prior to the system being recommissioned. The waste oil collection system will be reinstated prior to recommencing mining.	Active

ID	Criteria	Requirement	Audit Finding	Audit Recommendation	Responsibility (assigned by auditor)	Follow up Actions and Current Status	Status
NC44 Med	SOC, C9.18	Ensure all storage tanks are either self-bunded tanks or bunded with an impermeable surface and have a capacity to contain a minimum 110% of the largest storage tank capacity (ongoing).	The 2015 AEMR reports two above ground fuel storage tanks on site. One self-bunded 75,000L diesel tank is currently used to store a maximum of 35,000L fuel for pumps and light vehicles. A second tank (95,000L) was drained down and secured and is currently not in use. Waste oil is collected in the workshop area in portable drums for offsite disposal. Waste oil is also transferred to a bulk waste oil tank located in a bunded area near the vehicle servicing area. A catch drain adjacent to the waste oil tank is designed to capture any spills in this area. This drain leads to an oil/water separator and a 6,000L waste oil collection tank. During the site inspection, a number of observations were recorded as follows: 1. The catch drain system was (in sections) filled with oily sediment and debris and as the area is still in use for chemical storage, it requires cleaning and maintenance. 2. A break in the PVC pipes that leads from the catch drains to the oil/water separator and waste oil tank was observed. Should any spills within the bunded area occur, this would leak onto the soil and vegetation on the embankment. The piping needs repair and the integrity of the system requires testing. 3. The 6000L waste oil collection tank is not bunded. 4. Liquid waste containers stored within the workshop are not bunded.	*Ensure all liquid waste containers are stored within secondary containment / in bunding. *Undertake maintenance and cleaning of the wastewater catch drain system. *Retain all records of maintenance of equipment for a period of 7 years. *Retain all records of waste disposal for a period of 7 years. *Install bunding around the waste oil collection tank (if it is to remain operational). *Repair the breakage in the pipe that leads from the wastewater catch drain to the oil/water separator and waste oil collection tank. Investigate whether any soil contamination has resulted from the breakage. * Conduct a maintenance inspection and integrity test of the waste oil collection system tanks and piping.	Castlereagh Coal	The following items are included in the current inspection/ maintenance program. However, there is currently no formal recording of actions for repair/maintenance: • Inspection and maintenance of the catch drain system. • Inspection and maintenance of the wastewater collection system. • Plant and equipment maintenance and servicing. A new Inspection Checklist has been prepared to allow recording of repairs/maintenance and corrective actions required and this checklist is currently being used during routine inspections conducted by the Mining Engineering Manager. The waste oil collection system is currently not in use. However, repairs to the catch drain pipework will be undertaken as required. The wastewater collection system is now assessed during routine inspections. There is no evidence of leakage/spillage or contamination in this area and the system will continue to be monitored on a regular basis. The waste oil collection system is currently not in use. If this system is proposed to be used in future, bunding will be installed prior to use. The UST tank is empty and is not currently used. However, it may be used again once operations recommence so will not be decommissioned. The tank and associated pipework will be tested prior to recommissioning. **2016 – Annual Review Update** No further action required as waste oil system is not utilised. A risk assessment regarding the utilisation of the system will be undertaken prior to the system being recommissioned. **2017 – Annual Review Update** The waste oil system was not utilised during the 2017 report period. A risk assessment regarding the utilisation of the system will be undertaken prior to the system being recommissioned. The waste oil collection system will be reinstated prior to recommencing mining. **2018 – Annual Review Update** The waste oil system was not utilised during the 2018 report period. A risk assessment regarding the utilisation of the system will be undertaken prior to the system being recommissioned. The waste oil collection system will be reinstated prior to recommencing mining. **2019 – Annual Review Update** No further action required. The waste oil system was not utilised during the 2019 report period. A risk assessment regarding the utilisation of the system will be undertaken prior to the system being recommissioned. The waste oil collection system will be reinstated prior to recommencing mining. **2020 – Annual Review Update** No further action required. The waste oil system was not utilised during the 2020 report period. A risk assessment regarding the utilisation of the system will be undertaken prior to the system being recommissioned. The waste oil collection system will be reinstated prior to recommencing mining. **2021 – Annual Review Update** No further action required. The waste oil system was not utilised during the 2021 report period. A risk assessment regarding the utilisation of the system will be undertaken prior to the system being recommissioned. The waste oil collection system will be reinstated prior to recommencing mining. **2022 – Annual review Update** The waste oil system was not utilised during the 2022 report period. A risk assessment regarding the utilisation of the system will be undertaken prior to the system being recommissioned. The waste oil collection system will be reinstated prior to recommencing mining.	Active

ID	Criteria	Requirement	Audit Finding	Audit Recommendation	Responsibility (assigned by auditor)	Follow up Actions and Current Status	Status
NC50 High	EPL, A2.1	Premises or plant to which the licence applies. The licence applies to the following premises: THE INVINCIBLE COLLIERY, CASTLEREAGH HIGHWAY, CULLEN BULLEN, NSW 2790 LOT 1 DP 180294, LOT 113 DP 877190 PART BEN BULLEN STATE FOREST. INVINCIBLE COLIERY HOLDING	Project Approval 07_0127 is for: Part Ben Bullen State Forest, Lot 1/DP 180294, Lot 113/DP 877190 and Lot 112/DP 877190. The EPL does not cover Lot 112/DP 877190, an area of land partially within Ben Bullen State Forest and partially outside the Forest. Scheduled works have been undertaken across Lot 112/DP 877190 and the area is also established as a Biodiversity Offset Area. As the areas covered by the Project Approval do not align with the areas covered by the EPL, this is assessed as a non-compliance. A map showing the extent of the land covered by the EPL, in particular, the 'Part Ben Bullen State Forest, Invincible Colliery Holding' was not sighted and is not held by the EPA. Therefore it was difficult to determine if this area of the Project approval area called 'Part Ben Bullen State Forest ', on which coal works have been undertaken, aligns with the EPL.	Review premises details specified in condition A2.1 of the EPL to ensure that it is consistent with the area covered by the Project Approval. Vary the EPL if required.	Castlereagh Coal – the Auditor notes this was carried over from the EPL transferred from Coalpac to CC	EPA has advised that omission of Lot 112 DP877190 from the EPL is likely an oversight at the time of granting the licence. Castlereagh Coal will liaise with EPA to include this lot on the premises description on the licence. It is expected that this issue will be resolved on issue of the new approval and licence for the Invincible Southern Expansion Project. **2016 – Annual Review Update** No further action proposed. **2017 – Annual Review Update** No further action required. **2018 – Annual Review Update** No further action undertaken during 2018. A review of the Invincible EPL is to be undertaken during the 2019 report period. **2019 – Annual Review Update** A review of the Invincible EPL is to be undertaken prior to the recommencement of operations with a revised boundary to be submitted to the EPA at that time. **2020 – Annual Review Update** A review of the Invincible EPL is to be undertaken prior to the recommencement of operations with a revised boundary to be submitted to the EPA at that time. **2021 – Annual Review Update** A review of the Invincible EPL is to be undertaken prior to the recommencement of operations with a revised boundary to be submitted to the EPA at that time. **2022 – Annual review Update** The Invincible Environment Protection Licence was subsequently varied in consultation with the EPA in March 2023.	Active

NC55 Med	EPL, O2.1(a)	Maintenance of plant and equipment All plant and equipment installed at the premises or used in connection with the licensed activity: a) must be maintained in a proper and efficient condition; and	The 2015 AEMR reports that most mobile plant and equipment has been removed from the site. Remaining equipment (such as excavators and dozers used for erosion control and rehabilitation maintenance and a mobile water pump) is periodically run, where possible, with pre-start inspections conducted at each instance. Sedgman advise that light vehicles are serviced off-site as required and no records are kept on site. Maintenance/pre-start inspection records for mobile equipment were not verified. it is noted that the mobile water pump is new and has not required servicing. Stationary plant and equipment that is currently used on site during the care and maintenance period, as observed during the site inspection, includes (but is not limited to): a 75,000L diesel AST and a wastewater collection system. This system comprises a bulk waste oil tank and liquid waste storage facility that is bunded and contained by a catch drain network that leads to an oil/water separator and a 6,000L waste oil collection tank. An underground fuel storage tank is also reported to be located on the site. The fuel tank has not been used during the audit period and has not been decommissioned. Maintenance/servicing/integrity inspection records for this infrastructure were not sighted. During the site inspection, a number of observations were recorded as follows: 1. The catch drain system contained (in sections) oily sediment and debris.	Undertake maintenance and cleaning of the wastewater catch drain system. Conduct a maintenance inspection and integrity test of the wastewater collection system including bunding, tanks and piping. Repair the breakage in the piping that leads from the wastewater catch drain to the oil/water separator and waste oil collection tank. Investigate whether any soil contamination has resulted from the breakage. Install bunding around the waste oil collection tank (if it is to remain operational). Ensure all plant and equipment required during care and maintenance is maintained in a proper and efficient manner as per a maintenance schedule or manufacturer's instructions. Retain maintenance and servicing records for all plant and equipment used at the site. Investigate the status of UST (which has not been used for 3 years). Undertake integrity testing and report results in the AEMRs. If no longer required, decommission the UST in accordance with WorkSafe NSW and NSW EPA requirements. If	Castlereagh Coal	The following items are included in the current inspection/ maintenance program. However, there is currently no formal recording of actions for repair/maintenance: • Inspection and maintenance of the catch drain system. • Inspection and maintenance of the wastewater collection system. • Plant and equipment maintenance and servicing. A new Inspection Checklist has been prepared to allow recording of repairs/maintenance and corrective actions required and this checklist is currently being used during routine inspections conducted by the Mining Engineering Manager. The waste oil collection system is currently not in use. However, repairs to the catch drain pipework will be undertaken as required. The wastewater collection system is now assessed during routine inspections. There is no evidence of leakage/spillage or contamination in this area and the system will continue to be monitored on a regular basis. The waste oil collection system is currently not in use. If this system is proposed to be used in future, bunding will be installed prior to use. The UST tank is empty and is not currently used. However, it may be used again once operations recommence so will not be decommissioned. The tank and associated pipework will be tested prior to recommissioning. **2016 – Annual Review Update** No further action required as waste oil system is not utilised. A risk assessment regarding the utilisation of the system will be undertaken prior to the system being recommissioned. **2017 – Annual Review Update** The waste oil system was not utilised during the 2017 report period. A risk assessment regarding the utilisation of the system will be undertaken prior to the system being recommissioned. The waste oil collection system will be reinstated prior to recommencing mining. **2018 – Annual Review Update** The waste oil system was not utilised during the 2018 report period. A risk assessment regarding the utilisation of the system will be undertaken prior to the	Active

ID	Criteria	Requirement	Audit Finding	Audit Recommendation	Responsibility (assigned by auditor)	Follow up Actions and Current Status	Status
			2. A break in the PVC pipes that leads from catch drains to oil/water separator and waste oil collection tank. Should any spills within bunded area occur, this would leak onto the soil and vegetation on the embankment. 3. The 6000L waste oil collection tank is not bunded. The wastewater collection system is designed to capture any spills from current diesel AST refuelling area, bunded waste oil tank and liquid waste storage area. The 2015 AEMR reports that minor servicing may be undertaken on site using this infrastructure. As such it is required to be maintained in proper and efficient working condition during the care and maintenance period. The UST should be decommissioned in accordance with WorkSafe NSW and NSW EPA requirements.	the tank is proposed to be used in the future, it is recommended that CC arrange for the tank and associated piping be tested prior to recommissioning.		system being recommissioned. The waste oil collection system will be reinstated prior to recommencing mining. **2019 – Annual Review Update** The waste oil system was not utilised during the 2019 report period. A risk assessment regarding the utilisation of the system will be undertaken prior to the system being recommissioned. The waste oil collection system will be reinstated prior to recommencing mining. **2020 – Annual Review Update** The waste oil system was not utilised during the 2020 report period. A risk assessment regarding the utilisation of the system will be undertaken prior to the system being recommissioned. The waste oil collection system will be reinstated prior to recommencing mining. **2021 – Annual Review Update** The waste oil system was not utilised during the 2021 report period. A risk assessment regarding the utilisation of the system will be undertaken prior to the system being recommissioned. The waste oil collection system will be reinstated prior to recommencing mining. **2022 – Annual review Update** The waste oil system was not utilised during the 2022 report period. A risk assessment regarding the utilisation of the system will be undertaken prior to the system being recommissioned. The waste oil collection system will be reinstated prior to recommencing mining.	
NC59 Low	EPL, M2.2	Requirement to monitor concentration of pollutants discharged – Air Monitoring Requirements	Dust and HVAS monitoring data was reviewed from May 2013 to December 2015. PM10 - PM10 was monitored weekly and is reported as ug/m3. The ALS 2014 monthly dust monitoring reports specified that the HVAS monitoring was carried out in conformance with AS/NZS 3850.9.6:2003. The Castlereagh Coal monthly monitoring reports provide a summary of results only and do not specify sampling methodology (not verified). Deposited Matter - Dust gauges are monitored monthly and reported as g/m2/month. Weekly estimations of particulate matter are made as outlined below. The ALS 2014 monthly dust monitoring reports specified that the dust monitoring was carried out in conformance with AS/NZS 3580.10.1:2003. The CC monthly monitoring reports provide a summary of results only and do not specify sampling methodology (not verified). Particulate Matter (TSP) - The EPL requires monitoring of particulate matter at IDD1 (EPA point 3) weekly in accordance with AS/NZS 3580:2003 Methods for sampling and analysis of ambient air - Determination of suspended particulate matter - TSP matter - High volume sampler gravimetric method. The Project Approval specifies the impact assessment criteria for (TSP) monitoring. Review of the AQMP (2009) indicates that 'a determination was made to estimate TSP from PM10 data' that is collected using the high volume air sampler (HVAS) at this location.	The EPL specifies that particulate matter (TSP) is sampled using a high volume air sampler. In practice, at IDD1 (EPA point 3), TSP is estimated from PM10 data that is collected using a high volume air sampler. This revised sampling methodology is outlined in the Air Quality Management Plan, however is in contravention to the current EPL conditions. Consult with the EPA and DPE regarding the appropriateness of the sampling method used for measurement of TSP at IDD1 (EPA point 3). Retain copies of correspondence. If the change in sampling method for TSP is accepted by the relevant agencies, document the methodology for estimation of TSP from PM10 data and ensure this is recorded within the monthly air quality monitoring reports. Monthly monitoring reports to specify sampling methods to demonstrate compliance with EPL sampling method requirements.	Castlereagh Coal – the Auditor notes that the method of TSP sampling was also undertaken by Coalpac	The methodology for calculating TSP based on historic methodology is provided in the monthly monitoring reports provided by RCA to CC. This method was likely agreed between regulatory agencies and Coalpac prior to Castlereagh Coals involvement with the project. CC has sought clarification from the EPA and DPE whether this methodology is still acceptable. DPE has advised that monitoring is currently in accordance with the project approval, as Castlereagh Coal is monitoring air quality using a high volume air sampler and dust deposition gauges. We sent a request to EPA for approval of the calculation of TSP from PM_{10} data on 1st December 2016 but have not received a reply to date. A follow up email was sent to EPA on 13th January 2017. **2016 – Annual Review Update** Consultation will be undertaken with DP&E and EPA during 2017 to resolve the calculation methodology. **2017 – Annual Review Update** The Project Approval (as modified) requires the preparation of an Air Quality Management Plan (AQMP) in consultation with the EPA (Schedule 3 Condition 19). The AQMP will address this issue. The AQMP will be submitted during 2018. **2018 – Annual Review Update** The Project Approval (as modified) requires the preparation of an Air Quality Management Plan (AQMP) in consultation with the EPA (Schedule 3 Condition 19). The AQMP has been developed and submitted to the EPA for comment. The revised plan will be submitted to DPE during the 2019 report period. **2019 – Annual Review Update** The Project Approval (as modified) requires the preparation of an Air Quality Management Plan (AQMP) in consultation with the EPA (Schedule 3 Condition 19). The AQMP has been developed and submitted to the EPA for comment. The revised plan will be submitted to DPE prior to the recommencement of operations. **2020 – Annual Review Update**	Active

			Correspondence from the EPA accepting this change in methodology has not been sighted and given that it remains a condition of the EPL, this variation in sampling methodology is considered a non-compliance. Monitoring reports for August 2013 and September 2013 were not available and therefore, the Auditor could not verify compliance for these dates with respect to this condition.			The Project Approval (as modified) requires the preparation of an Air Quality Management Plan (AQMP) in consultation with the EPA (Schedule 3 Condition 19). The AQMP has been developed and submitted to the EPA for comment. The revised plan will be submitted to DPE prior to the recommencement of operations. **2021 – Annual Review Update** The Project Approval (as modified) requires the preparation of an Air Quality Management Plan (AQMP) in consultation with the EPA (Schedule 3 Condition 19). The AQMP has been developed and submitted to the EPA for comment. The revised plan will be submitted to DPE prior to the recommencement of operations. **2022 – Annual Review Update** An Air Quality Management Plan (AQMP) was approved in November 2022 following extensive stakeholder and agency consultation. A standalone TSP unit has been installed at Invincible Colliery.	

ID	Criteria	Requirement	Audit Finding	Audit Recommendation	Responsibility (assigned by auditor)	Follow up Actions and Current Status	Status
NC60 Low	EPL, M3.1	Testing methods - concentration limits Monitoring for the concentration of a pollutant emitted to the air required to be conducted by this licence must be done in accordance with: a) any methodology which is required by or under the Act to be used for the testing of the concentration of the pollutant; or b) if no such requirement is imposed by or under the Act, any methodology which a condition of this licence requires to be used for that testing; or c) if no such requirement is imposed by or under the Act or by a condition of this licence, any methodology approved in writing by the EPA for the purposes of that testing prior to the testing taking place. Note: The *Protection of the Environment Operations (Clean Air) Regulation 2010* requires testing for certain purposes to be conducted in accordance with test methods contained in the publication "Approved Methods for the Sampling and Analysis of Air Pollutants in NSW".	Refer to M2.2. A full assessment of the requirements under the *Protection of the Environment Operations (Clean Air) Regulation 2010* has not been undertaken.	Refer to recommendations in NC59.	Castlereagh Coal	The methodology for calculating TSP based on historic methodology is provided in the monthly monitoring reports provided by RCA to CC. This method was likely agreed between regulatory agencies and Coalpac prior to Castlereagh Coals involvement with the project. CC has sought clarification from the EPA and DPE whether this methodology is still acceptable. DPE has advised that monitoring is currently in accordance with the project approval, as CC is monitoring air quality using a high volume air sampler and dust deposition gauges. We sent a request to EPA for approval of the calculation of TSP from PM10 data on 1st December 2016 but have not received a reply to date. A follow up email was sent to EPA on 13th January 2017. **2016 – Annual Review Update** Consultation will be undertaken with DP&E and EPA during 2017 to resolve the calculation methodology. **2017 – Annual Review Update** The Project Approval (as modified) requires the preparation of an AQMP in consultation with the EPA (Schedule 3 Condition 19). The AQMP will address this issue. The AQMP will be submitted during 2018. **2018 – Annual Review Update** The Project Approval (as modified) requires the preparation of an Air Quality Management Plan (AQMP) in consultation with the EPA (Schedule 3 Condition 19). The AQMP has been developed and submitted to the EPA for comment. The revised plan will be submitted to DPE during the 2019 report period. **2019 – Annual Review Update** The Project Approval (as modified) requires the preparation of an Air Quality Management Plan (AQMP) in consultation with the EPA (Schedule 3 Condition 19). The AQMP has been developed and submitted to the EPA for comment. The revised plan will be submitted to DPE prior to the recommencement of operations. **2020 – Annual Review Update** The Project Approval (as modified) requires the preparation of an Air Quality Management Plan (AQMP) in consultation with the EPA (Schedule 3 Condition 19). The AQMP has been developed and submitted to the EPA for comment. The revised plan will be submitted to DPE prior to the recommencement of operations. **2021 – Annual Review Update** The Project Approval (as modified) requires the preparation of an Air Quality Management Plan (AQMP) in consultation with the EPA (Schedule 3 Condition 19). The AQMP has been developed and submitted to the EPA for comment. The revised plan will be submitted to DPE prior to the recommencement of operations. **2022 – Annual Review Update** An Air Quality Management Plan (AQMP) was approved in November 2022 following extensive stakeholder and agency consultation. A standalone TSP unit has been installed at Invincible Colliery.	Active

Invincible Colliery IEA Action Plan: Improvement Opportunities

ID	Criteria	Audit Recommendation	Proposed Action	Status as at 31 December 2022
IO4	PA 07_0127, S3, C11	Engage a qualified technician to undertake an operation, maintenance and calibration check of the meteorological station and gain written confirmation that it complies with the requirements of the Approved Methods for Sampling of Air Pollutants in New South Wales guideline (in line with PA 07_0127, Schedule 3, Condition 11).	Weather stations are calibrated regularly during download of meteorological data by RCA. Weather stations services are conducted regularly by Ecotech qualified technicians. Full calibration of the stations in accordance with the Australian Standard will be undertaken prior to recommencement of mining operations.	Weather station calibration undertaken during reporting period. Completed.
IO7	PA 07_0127, S5, C1(a)	Consult with the DPE to verify whether the Environmental Management Strategy (Coalpac, November 2009) has been approved by the DPE as required by PA 07_0127 Schedule 5, Condition 1.	This document was prepared by Coalpac in 2009 and has been implemented on site. We have no evidence of approval by DPE as this pre-date Castlereagh Coal's involvement in the project. However, we will request confirmation of this from DPE.	EMS Approved.
IO10	SOC, C5.3	Ensure all equipment used on site is regularly serviced and all service records are kept on file. Conduct periodic checks of the sound power levels of equipment used on site during noise generating maintenance works to compare against the levels used in the modelling and confirm compliance with noise criteria (as required by SOC Condition 5.3).	Servicing is conducted as described in **NC55.** There is plant and equipment used as needed on site during care and maintenance, however, this plant and equipment is serviced as required. There have been no complaints of noise disturbance from Invincible Colliery during the audit period and quarterly monitoring of noise from the mine is undertaken by Global Acoustics. Once mining operations recommence, sound power levels of equipment will be checked.	The waste oil system was not utilised during the 2022 report period. A risk assessment regarding the utilisation of the system will be undertaken prior to the system being recommissioned. The waste oil collection system will be reinstated prior to recommencing mining.
IO12	SOC, C7.5	Review target noxious weed species in subsequent control programs to capture the species identified during the site inspection on 28 January 2016, including Scotch Thistle (*Onopordum acanthium*) that were not known to be targeted during recent control spraying.	Targeted and general weed spraying was undertaken in consultation with ecologists undertaking annual biodiversity monitoring. Weed species were prioritised and spraying conducted between November 2015 and May 2016. It is likely that this weed was sprayed following the site inspection. Biodiversity monitoring will be undertaken again in November/December 2016 and will identify any further species required for weed control.	No further action required. This SOC has been removed from the Project Approval, weed management activities are reported in the Annual Review. A Rehabilitation Strategy, revised Biodiversity Management Plan, and a revised Rehabilitation Management Plan were submitted to regulatory authorities in 2018 for comment. These revised plans will be submitted to DPIE prior to the recommencement of operations. Annual biodiversity and rehabilitation monitoring was also undertaken during 2022.
IO13	SOC, C7.11	Requires planting of *Eucalyptus cannonii*. The 2013 AEMR (Coalpac, 2013b) describes the planting of *E. cannonii* (Section 3.8.1) although this species does not appear on the Rehabilitation Seed Species List in Table 17 of the AEMR. It is recommended that future AEMRs provide consistency between relevant sections of the report, or supplementary information on the planting of *Eucalyptus cannonii* is documented.	Please refer to the response to **IO9**	Rehab Strategy approved and RMP completed during reporting period. BMP in consultation with BCD toward finalising.
IO14	SOC, C8.2	Conduct inspections of the Aboriginal Heritage site 'Invincible OS1' prior to any planned pumping activity in the vicinity of the site, to ensure that planned water movements do not cause flood impacts to this area in accordance with the requirements of SOC Condition 8.2. Monitor the 'Invincible OS1' site during heavy rainfall periods and implement non-intrusive measures to divert water away from this area as required to minimise flooding impacts.	There is no active pumping into this area. This area only receives runoff from rehabilitation areas located upstream. Site operational staff are not aware of any flooding impacts that have occurred in this area in the last 3 years.	ACHMP approved
IO19	SOC, C11.16	Ensure all plant and equipment required during care and maintenance is maintained in a proper and efficient manner as per a maintenance schedule or manufacturer's instructions. Retain service records for all plant and equipment installed at the premises or currently used in connection with Project.	Please refer to the response to **NC55**	No further action required. This SOC has been removed from the Project Approval. The waste oil system was not utilised during the 2022 report period. A risk assessment regarding the utilisation of the system will be undertaken prior to the system being recommissioned. The waste oil collection system will be reinstated prior to recommencing mining.
IO21	EPL, A3.1	Obtain a copy of the EPL application and review current works and activities to determine compliance with EPL condition A3.1. Establish and maintain a compliance register and include the requirements of the EPL application to enable compliance tracking.	CC does not have access to the original licence application as this was submitted by Coalpac. However, we will request this information from the EPA.	The scheduled activities listed on the licence are "Coal Works" and "Mining for Coal" and are consistent with that previously undertaken at the mine.

ID	Criteria	Audit Recommendation	Proposed Action	Status as at 31 December 2021
IO22	EPL, P1.3	Update the maps within relevant Environmental Management plans (including the Water Management Plan to clearly identify the location of the wet weather discharge monitoring point (EPA identification 2).	Please refer to the response to **NC45**	WMP approved.
IO34	LMP S7.1.1	Annual flora and fauna and rehabilitation monitoring has not recorded the following parameters during the audit period: Species Diversity (the presence of at least four overstorey and four understorey species in 20m x 10m plot per 10ha); Stem densities. Minimum total tree/shrub densities for sown areas are: (i) Year 2 - 3,000 stems/ha (ii) Year 5 - 2,000 stems/ha (iii) Year 7 - 600 stems/ha. This is not reported in the AEMRS. There are no fixed monitoring plots within rehabilitation post 2011. It is recommended that a review of rehabilitation performance against the stated criteria in the LMP is undertaken.	Please refer to the response to **NC49**	Annual biodiversity monitoring conducted during 2022 with results included within the 2022 Annual Review. Rehab Strategy and RMP completed, BMP in consultation with BCD.
IO35	LMP S7.2(e)	The LMP (Section 7.2) requires areas not vegetated with established/remnant native trees and shrubs to be deep ripped in preparation for planting or seeding. No evidence that deep ripping has occurred within the BOA grassland areas during the site inspection. It is recommended that the need for this requirement be reviewed in the next monitoring session, and reported within the AEMR. Undertake deep ripping, if deemed appropriate.	The need for this requirement will be reviewed in consultation with consultants engaged to undertake future biodiversity monitoring. All works undertaken in rehabilitation and biodiversity offsets areas will be reported in the AEMR.	Annual biodiversity monitoring conducted during 2022 with results included within the 2022 Annual Review. Rehab Strategy and RMP completed, BMP in consultation with BCD.
IO36	LMP S7.2(f)	The LMP (Section 7.2) requires seeds to be sown in areas not designated for tubestock planting. No seeding was reported in the AEMRs. It is recommended that the need for this requirement be reviewed following the next monitoring session, and reported within the AEMR. Undertake seeding in appropriate areas, as recommended.	Please refer to the response to **IO35**	Annual biodiversity monitoring conducted during 2022 with results included within the 2022 Annual Review. Rehab Strategy approved and RMP completed. BMP in consultation with BCD toward finalising.
IO37	LMP S7.2(g)	The LMP (Section 7.2) requires tubestock planting in areas which contain already established native grasses. No tubestock planting was reported in the AEMR. It is recommended that the need for this requirement be reviewed following the next monitoring session, and reported within the AEMR. Undertake planting in appropriate areas, as recommended.	Please refer to the response to **IO35**	Annual biodiversity monitoring conducted during 2022 with results included within the 2022 Annual Review. Rehab Strategy approved and RMP completed. BMP in consultation with BCD toward finalising.
IO38	LMP S7.2(h)	The LMP (Section 7.2) requires the addition of fertiliser during the sowing and tubestock planting process. No fertiliser application in BOA was reported in the AEMR. It is recommended that the need for this requirement be reviewed following the next monitoring session, and reported within the AEMR. Undertake in appropriate areas, as recommended.	Please refer to the response to **IO35**	Annual biodiversity monitoring conducted during 2022 with results included within the 2022 Annual Review. Rehab Strategy approved and RMP completed. BMP in consultation with BCD toward finalising.
IO39	LMP S8.1(b)	The LMP (Section 8.1) requires regular walk-through site assessment (minimum once a year). Walk-through site assessments have been conducted as part of the annual monitoring; however it is unclear if all areas of rehabilitation have been inspected annually. This should be clarified/updated as part of future monitoring.	Please refer to the response to **NC49**	Annual biodiversity monitoring conducted during 2022 with results included within the 2022 Annual Review. Rehab Strategy approved and RMP completed. BMP in consultation with BCD toward finalising.
IO40	LMP S8.1(c)	The LMP (Section 8.1) requires formal long-term monitoring using fixed monitoring plots. These have been established in older rehabilitation areas (centred within and around the 2008 block). However, monitoring plots are absent from 2012 and part of 2011 rehabilitation areas. It is recommended that fixed monitoring plots are established within all blocks of rehabilitation, including the 2012 rehabilitation areas. Monitoring should occur from the next season.	Please refer to the response to **NC49**	Annual biodiversity monitoring conducted during 2022 with results included within the 2022 Annual Review. Rehab Strategy approved and RMP completed. BMP in consultation with BCD toward finalising.

ID	Criteria	Audit Recommendation	Proposed Action	Status as at 31 December 2020
IO41	Ecology	Specific ecological adaptive management recommendations have been made by Kleinfelder (2015), as part of the Annual Flora, Fauna and Rehabilitation Monitoring report, and these are supported by observations and recommendations resulting from the site inspection by Cumberland Ecology. The rehabilitation program should be updated as per the findings of the Cumberland Ecology assessment and the recommendations of annual monitoring.	Please refer to the response to **NC49** The need for this requirement will be reviewed in consultation with ecological consultants engaged to undertake future biodiversity monitoring.	Annual biodiversity monitoring conducted during 2022 with results included within the 2022 Annual Review. Rehab Strategy approved and RMP completed. BMP in consultation with BCD toward finalising.
IO42	Ecology	Additional statistical data analysis could be performed to gain a greater understanding of the changes in species composition over time in the BOA, and this would strengthen the monitoring reports.	Please refer to the response to **NC49** The need for this requirement will be reviewed in consultation with ecological consultants engaged to undertake future biodiversity monitoring.	Annual biodiversity monitoring conducted during 2022 with results included within the 2022 Annual Review. Rehab Strategy approved and RMP completed. BMP in consultation with BCD toward finalising.
IO43	Ecology	2012 rehabilitation was in very poor condition. Exotic species were found to dominate the understorey with native eucalypt and acacia species germination found to be limited. No tubestock planting was observed in this area. It is therefore recommended that slope stabilisation, seeding, and subsequent tubestock planting (after the slope is stabilised) be undertaken in this area of rehabilitation.	Please refer to the response to **NC49**	Annual biodiversity monitoring conducted during 2022 with results included within the 2022 Annual Review. Rehab Strategy approved and RMP completed. BMP in consultation with BCD toward finalising.
IO44	Ecology	The key area for continuing improvement of flora, fauna and rehabilitation management is the remedial action within failed and poor quality rehabilitation areas, particularly the 2012 blocks.	Please refer to the response to **NC49**	Annual biodiversity monitoring conducted during 2022 with results included within the 2022 Annual Review. Rehab Strategy approved and RMP completed. BMP in consultation with BCD toward finalising.
IO45	Ecology	Low condition grasslands were not observed to be regenerating and adaptive management should be reviewed.	Please refer to the response to **NC49.** The need for this requirement will be reviewed in consultation with ecological consultants engaged to undertake future biodiversity monitoring.	Annual biodiversity monitoring conducted during 2022 with results included within the 2022 Annual Review. Rehab Strategy approved and RMP completed. BMP in consultation with BCD toward finalising.
IO46	Ecology	Actions such as deep-ripping have not been employed at the edges of the moderate quality woodland and native dominated grasslands, which would be likely to improve natural regeneration. Bush regeneration techniques to promote natural regeneration, and then supplementing with tubestock planting and seeding, as part of an adaptive and ongoing approach would be suitable, and should be reviewed in the final MOP and supporting management plans.	Please refer to the response to **IO35**, **IO36** and **IO37**	Annual biodiversity monitoring conducted during 2022 with results included within the 2022 Annual Review. Rehab Strategy approved and RMP completed. BMP in consultation with BCD toward finalising.
IO47	Ecology	A low intensity ecological burn within the BOA has been recommended in each monitoring report. This recommendation has not been followed; and is supported by the findings of the Cumberland Ecology site inspection. Controlled ecological burn are very useful for promoting natural regeneration, and are suitable for all the vegetation types present in the BOA and should be considered.	Please refer to the response to **NC49** The need for this requirement will be reviewed in consultation with ecological consultants engaged to undertake future biodiversity monitoring.	Annual biodiversity monitoring conducted during 2022 with results included within the 2022 Annual Review. Rehab Strategy approved and RMP completed. BMP in consultation with BCD toward finalising.
IO50		The UST and its management or maintenance is not recorded in any documents relevant to the audit period. It is recommended that the UST be included within the Care and Maintenance MOP and regular maintenance by carried out and reported in the AEMRs. It the tank is no longer required, it should be decommissioned in accordance with WorkCover and NSW EPA requirements.	Please refer to the response to **NC55** If any works are undertaken on the UST, these will be documented in the MOP and reported in the AEMR.	The waste oil system was not utilised during the 2022 report period. A risk assessment regarding the utilisation of the system will be undertaken prior to the system being recommissioned. The waste oil collection system will be reinstated prior to recommencing mining.