


	WHITEHAVEN GOC	Document Owner:	Env Advisor
		Document Approver:	Env Superintendent
		Revision Period:	3 years
		Issue:	1
		Last Revision Date:	December 2023

WHC-PLN-OC-CHPP- Rehabilitation Management Plan

WHITEHAVEN COAL

WHITEHAVEN COAL HANDLING AND
PREPARATION PLANT
REHABILITATION MANAGEMENT PLAN

Approval	Name	Position	Signed	Date
Document Owner:	Andrew Raal	Superintendent - Closed Mines		12/01/2024



WHITEHAVEN GOC

Document Owner:	Env Advisor
Document Approver:	Env Superintendent
Revision Period:	3 years
Issue:	1
Last Revision Date:	December 2023

WHC-PLN-OC-CHPP- Rehabilitation Management Plan

Summary Table

Name of Mine	Whitehaven Coal Handling and Preparation Plant
Rehabilitation Management Plan Commencement Date	September 2023
Mining Authorisations (Lease / Licence No.)	Application submitted
Name of Authorisation holder(s)	Whitehaven Coal Mining Limited
Name of Mine Operator (if different)	Whitehaven Coal Mining Limited
Date	July 2023
Version	Version 1.0



WHITEHAVEN GOC

Document Owner:	Env Advisor
Document Approver:	Env Superintendent
Revision Period:	3 years
Issue:	1
Last Revision Date:	December 2023

WHC-PLN-OC-CHPP- Rehabilitation Management Plan

Contents

1	INTRODUCTION TO MINING PROJECT	5
1.1	HISTORY OF OPERATION	5
1.1.1	CURRENT DEVELOPMENT CONSENTS, LEASES AND LICENCES	8
1.1.2	DEVELOPMENT CONSENTS	8
1.1.3	AUTHORISATIONS	8
1.1.4	PROJECT APPROVAL CONDITIONS	8
1.1.5	OTHER APPROVALS	9
1.2	APPLICABLE GUIDELINES	10
1.3	LAND OWNERSHIP AND LAND USE	11
1.3.1	LAND OWNERSHIP	11
1.3.2	HISTORIC AND CURRENT LAND USE	11
1.3.3	FUTURE LAND USE	16
2	FINAL LAND USE	17
2.1	REGULATORY REQUIREMENTS FOR REHABILITATION	17
2.2	FINAL LAND USE OPTIONS ASSESSMENT	20
2.3	FINAL LAND USE STATEMENT	20
2.4	FINAL LAND USE AND MINING DOMAINS	20
2.4.1	FINAL LAND USE DOMAINS	20
2.4.2	MINING DOMAINS	21
3	REHABILITATION RISK ASSESSMENT	22
3.1	SUMMARY OF RISK ASSESSMENTS	22
3.2	REHABILITATION RISK ASSESSMENT	22
3.2.1	SPECIFIC RISKS RELATING TO REHABILITATION	23
3.2.2	FURTHER STUDIES / ACTION PLAN	24
4	REHABILITATION OBJECTIVES AND REHABILITATION COMPLETION CRITERIA	25
4.1	DA 0079.2002 REQUIREMENTS	25
4.2	SPECIFIC REHABILITATION OBJECTIVES	26
4.2.1	SHORT-TERM REHABILITATION AND CLOSURE OBJECTIVES	26
4.2.2	LONG-TERM REHABILITATION AND CLOSURE OBJECTIVES	26
4.3	DOMAIN REHABILITATION OBJECTIVES	26
4.4	REHABILITATION COMPLETION CRITERIA	27
4.5	REHABILITATION OBJECTIVES AND REHABILITATION COMPLETION CRITERIA – STAKEHOLDER CONSULTATION	34
4.5.1	STAKEHOLDER ENGAGEMENT PLAN	34



WHITEHAVEN GOC

Document Owner:	Env Advisor
Document Approver:	Env Superintendent
Revision Period:	3 years
Issue:	1
Last Revision Date:	December 2023

WHC-PLN-OC-CHPP- Rehabilitation Management Plan

4.5.2	PROPOSED FUTURE CONSULTATION	34
5	FINAL LANDFORM AND REHABILITATION PLAN	36
5.1	FINAL LANDFORM AND REHABILITATION PLAN – ELECTRONIC COPY	36
6	REHABILITATION IMPLEMENTATION	39
6.1	LIFE OF MINE REHABILITATION SCHEDULE	39
6.1.1	INFRASTRUCTURE	39
6.1.2	MINING ACTIVITIES	40
6.1.3	REHABILITATION ACTIVITIES	40
6.2	PHASES OF REHABILITATION AND GENERAL METHODOLOGIES	41
6.2.1	ACTIVE MINING PHASE	42
6.2.2	DECOMMISSIONING	43
6.2.3	LANDFORM ESTABLISHMENT	45
6.2.4	GROWTH MEDIUM DEVELOPMENT	45
6.2.5	ECOSYSTEM AND LAND USE ESTABLISHMENT	46
6.2.6	ECOSYSTEM AND LAND USE DEVELOPMENT	47
6.2.7	REHABILITATION COMPLETION (SIGN-OFF)	48
6.3	REHABILITATION OF AREAS AFFECTED BY SUBSIDENCE	48
7	REHABILITATION QUALITY ASSURANCE PROCESS	49
8	REHABILITATION MONITORING PROGRAM	52
8.1	ANALOGUE SITE BASELINE MONITORING	52
8.2	REHABILITATION ESTABLISHMENT MONITORING	52
8.3	MEASURING PERFORMANCE AGAINST REHABILITATION OBJECTIVES AND REHABILITATION COMPLETION CRITERIA	52
8.4	ANNUAL REHABILITATION MONITORING	53
8.5	REHABILITATION PERFORMANCE	53
9	REHABILITATION RESEARCH, MODELLING AND TRIALS	54
10	INTERVENTION AND ADAPTIVE MANAGEMENT	54
11	REVIEW, REVISION AND IMPLEMENTATION	64
11.1	REVIEW AND REVISION OF THE PLAN	64
11.2	IMPLEMENTATION	64
	ACCOUNTABILITIES	65
	SUPPORTING DOCUMENTATION	65

	WHITEHAVEN GOC	Document Owner:	Env Advisor
		Document Approver:	Env Superintendent
		Revision Period:	3 years
		Issue:	1
		Last Revision Date:	December 2023
WHC-PLN-OC-CHPP- Rehabilitation Management Plan			

1 INTRODUCTION TO MINING PROJECT

The Whitehaven Gunnedah Coal Handling and Preparation Plant (CHPP) is a coal receival and processing facility with a rail loop and rail loading facility. Site is located within the Gunnedah Shire, approximately 5 kilometres (km) west of Gunnedah on the Kamilaroi Highway in northern New South Wales (NSW). (**Figure 1**).

Site processing capacity is up to 3.0 million tonnes of ROM coal per annum, with a dispatch capacity of up to 4.1million tonnes of coal.

This Rehabilitation Management Plan (RMP) has been prepared in accordance with Development application PA 0079.2002 to satisfy Condition 15, Schedule 3 of which requires a Rehabilitation Management Plan to be developed.

A Mining lease and authorisation for the project site from the Resource Regulator (RR) is currently being processed. The RMP has been developed in conformance with the RR: *Rehabilitation Management Plan for Large Mines* (RR, 2021) and associated guidelines (refer **Section 1.3**).

Operations are expected to continue till mid-2026, whereafter all useable coal beneficiation infrastructure will be recovered and repurposed within other Whitehaven Coal operations. After cessation of mining (coal crushing, separation/'washing' and train loading), it is expected to take an additional 24months for the settling ponds to dry out and rejects to be removed, stie decontamination and decommissioning (refer to Section 6.1.3)

1.1 HISTORY OF OPERATION

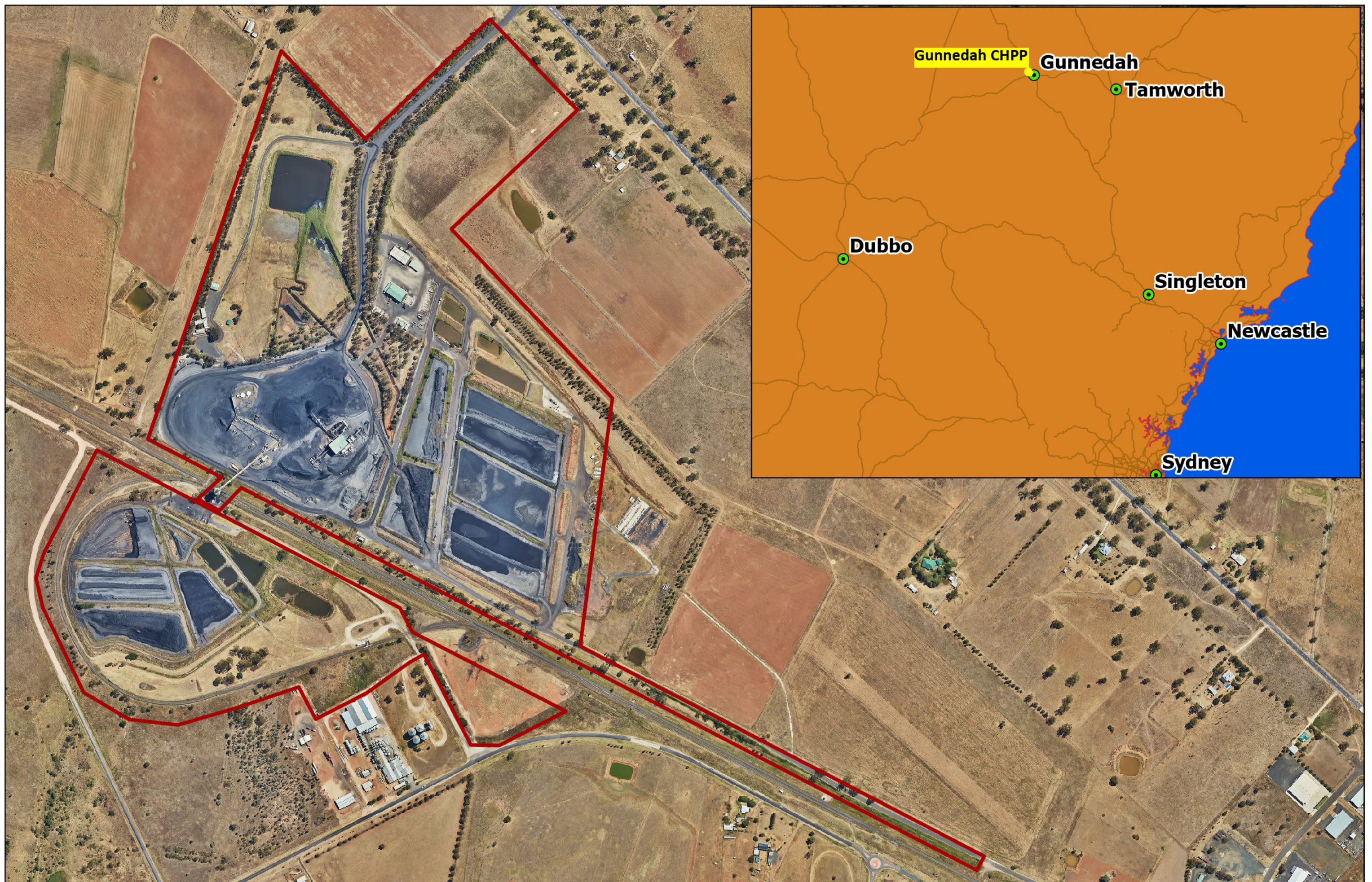
The Whitehaven CHPP and Rail Load-Out Facility is owned and operated by Whitehaven Coal Limited (Whitehaven) and was originally approved by Gunnedah Shire Council on 7th September 2002 under Project Approval 0079.2002. The location of the Whitehaven CHPP and Rail Load-Out Facility and its regional setting is shown on Figure 1.

A modification was approved on the 17th April 2008, for an upgrade to the CHPP and the construction of 2 additional reject ponds.

On 23rd December 2011, a proposal to construct additional reject ponds at the CHPP was approved by DP&E (formerly the Department of Planning and Infrastructure), which provided for the construction of 3 additional reject ponds and 2 settlement ponds to the immediate east of the existing pond footprint.

Modification 1 was approved on the 24th August 2015, to rectify an administrative issue.

Modification 2 was approved on the 12th September 2022, to extend the CHPP life until 2nd October 2026, reconfigure existing settlement ponds and construction of new water storage dam. Site Layout is shown in **Figure 2**.



Gunnedah CHPP Regional Locality

Figure 1

 CHPP Project Boundary





Gunnedah CHPP Site Layout

Figure 2

	WHITEHAVEN GOC	Document Owner:	Env Advisor
		Document Approver:	Env Superintendent
		Revision Period:	3 years
		Issue:	1
		Last Revision Date:	December 2023
WHC-PLN-OC-CHPP- Rehabilitation Management Plan			

1.1.1 CURRENT DEVELOPMENT CONSENTS, LEASES AND LICENCES

1.1.2 DEVELOPMENT CONSENTS

Table 1 below shows the Development Consent held by Gunnedah CHPP.

Table 1 Development Consents

Issuing / Responsible Authority	Development Consent*	Details	Date of Issue	Expiry
Gunnedah Shire Council	DA 0079.2002	Initial PA by Gunnedah Shire Council	2/10/2002	
Gunnedah Shire Council	DA 0079.2002	Upgrade to CHPP and two additional reject ponds	17/04/2008	
DP&E	DA 0079.2002	Construction of three additional reject ponds and two settlement ponds	23/12/2011	
DP&E	DA 0079.2002 (MOD1)	MOD1: To rectify and administrative issue.	24/08/2015	
DP&E	DA 0079.2002 (MOD2)	MOD2: to extend the CHPP operations, reconfigure existing settlement ponds and construction of new water storage dam	12/09/2022	Mining operations until 02/10/2026

1.1.3 AUTHORISATIONS

A Mining lease and authorisation for the project site from the Resource Regulator (RR) is currently being processed. **Table 2 Authorisations**

Issuing / Responsible Authority	Licence	Grant Date	Expiry Date	Status
RR	NA	NA	NA	In process of being issued

1.1.4 PROJECT APPROVAL CONDITIONS

This Management Plan has been developed to conform with the DA project approval conditions using the Resource Regulator rehabilitation guidelines.

Whitehaven Coal commits to implement the Rehabilitation Management Plan (RMP) and all requirements listed in this section. Any deviation will be through an amended RMP or project approval after consultation and approval by the DPE.

The following DA 0079.2002 project approval conditions are relevant to the RMP.

	WHITEHAVEN GOC	Document Owner:	Env Advisor
		Document Approver:	Env Superintendent
		Revision Period:	3 years
		Issue:	1
		Last Revision Date:	December 2023
WHC-PLN-OC-CHPP- Rehabilitation Management Plan			

Schedule 3: 18: Access to Information

- (a) make the following information publicly available on its website:
- approved plans required under the conditions of this consent;

Schedule 3: 19: Access to Information

Within 3 months of:

- (a) The submission of an annual report under condition 16 above;
- (b) any modification to the conditions of this consent; or
- (c) the submission of an incident report under condition 20 of Schedule 3. the Applicant shall review, and if necessary, revise, the plans required under this consent to the satisfaction of the Secretary. Where this review leads to revisions of any plan then within four weeks of the review the revised document must be submitted to the Secretary for approval.

Schedule 3: 20: Incident Notification

20. The Applicant must immediately notify the Department and any other relevant agencies after it becomes aware of an incident. The notification must be in writing via the Department's Major Projects Website and identify the development (including the application number and name) and set out the location and nature of the incident

Schedule 3: 21: Non-Compliance Notification

21. Within seven days of becoming aware of a non-compliance, the Applicant must notify the Department of the non-compliance. The notification must be in writing via the Department's Major Projects Website and identify the development (including the application number and name), set out the condition of this consent that the development is non-compliant with, why it does not comply and the reasons for the noncompliance (if known) and what actions have been, or will be, undertaken to address the non-compliance

1.1.5 OTHER APPROVALS

A summary of all licences held by CHPP for the mining operations are included in **Table 3**.

Table 3 Licences

Issuing / Responsible Authority	Licence	Licence Type	Grant Date	Expiry date
Environment Protection Authority (EPA)	EPL 3637	Environment Protection Licence	07 Aug 2000	Anniversary date 1 st April
WaterNSW	WAL12724	Olive View (Share 45)	19/07/2010	
	WAL12731	Overtime (Share 3)	13/03/2024	
	WAL12715	Olive View (Share 75)	09/05/2007	



WHITEHAVEN GOC

Document Owner:	Env Advisor
Document Approver:	Env Superintendent
Revision Period:	3 years
Issue:	1
Last Revision Date:	December 2023

WHC-PLN-OC-CHPP- Rehabilitation Management Plan

Issuing / Responsible Authority	Licence	Licence Type	Grant Date	Expiry date
	WAL16034	Regulated River High security (Share 50)	16/12/2009	
	WAL14936	Regulated River Water Source (General Security)	19/01/2010	
	WAL12645	Olive View (Share 35)	13/07/2009	
	WAL12701	Wirringulla (Share 20)	28/02/2008	
	90BL254681	Monitoring Piezometer	6/03/2009	Perpetuity
	90BL254680	Monitoring Piezometer	7/03/2009	Perpetuity
	90BL254682	Monitoring Piezometer	7/03/2009	Perpetuity

1.2 APPLICABLE GUIDELINES

In addition to the regulatory requirements identified above, this Plan has been prepared with consideration for the following guidelines, standards, and policies:

- *Form and way: Rehabilitation Management Plan (large mines);*
- *Form and way: Rehabilitation objectives, rehabilitation completion criteria and final landform and rehabilitation plan for large mines;*
- *Guideline: Rehabilitation risk assessment;*
- *Guideline: Rehabilitation objectives and rehabilitation completion criteria;*
- *Planning for Integrated Mine Closure Toolkit (ICMM, 2008);*
- *Mining Amendment (Standard Condition of Mining Leases – Rehabilitation) Regulation 2021;*
- *Strategic Framework for Mine Closure (ANZMEC 2000);*
- *Leading Practice Sustainable Development Program for the Mining Industry – Mine Closure and Completion, Mine Rehabilitation (Commonwealth Department of Industry, Tourism and Resources);*
- *Best Practice Environmental Management in the Mining Industry Series;*
- *Enduring Value (Mineral Council of Australia 2015); and*
- *State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007 (Mining SEPP).*



WHITEHAVEN GOC

Document Owner:	Env Advisor
Document Approver:	Env Superintendent
Revision Period:	3 years
Issue:	1
Last Revision Date:	December 2023

WHC-PLN-OC-CHPP- Rehabilitation Management Plan

1.3 LAND OWNERSHIP AND LAND USE

1.3.1 LAND OWNERSHIP

Project boundary and Land ownership within is shown in Figure3, and property details are given in Table 4.

Table 4 Properties Licences

Property No.	Lot*	Ownership
DP755503	Lot 112	Whitehaven Coal
DP755503	Lot 474	Whitehaven Coal
DP755503	Lot 471	Whitehaven Coal
DP755503	Lot 475	Whitehaven Coal
DP755503	Lot 498	Whitehaven Coal
DP755503	Lot 111	Whitehaven Coal
DP755503	Lot 473	Whitehaven Coal
DP755503	Lot 472	Whitehaven Coal
DP723509	Lot 1	Whitehaven Coal
DP705086	Lot 678	Whitehaven Coal
DP239575	Lot 1	Whitehaven Coal
DP542047	Lot 12	Whitehaven Coal
DP239575	Lot 1	Gunnedah Shire (Rail siding)
DP542047	Lot 12	Gunnedah Shire (Rail siding)

The CHPP project covers an area of 92 ha of which 23ha the southern rail loop area is leased from Gunnedah Shire.

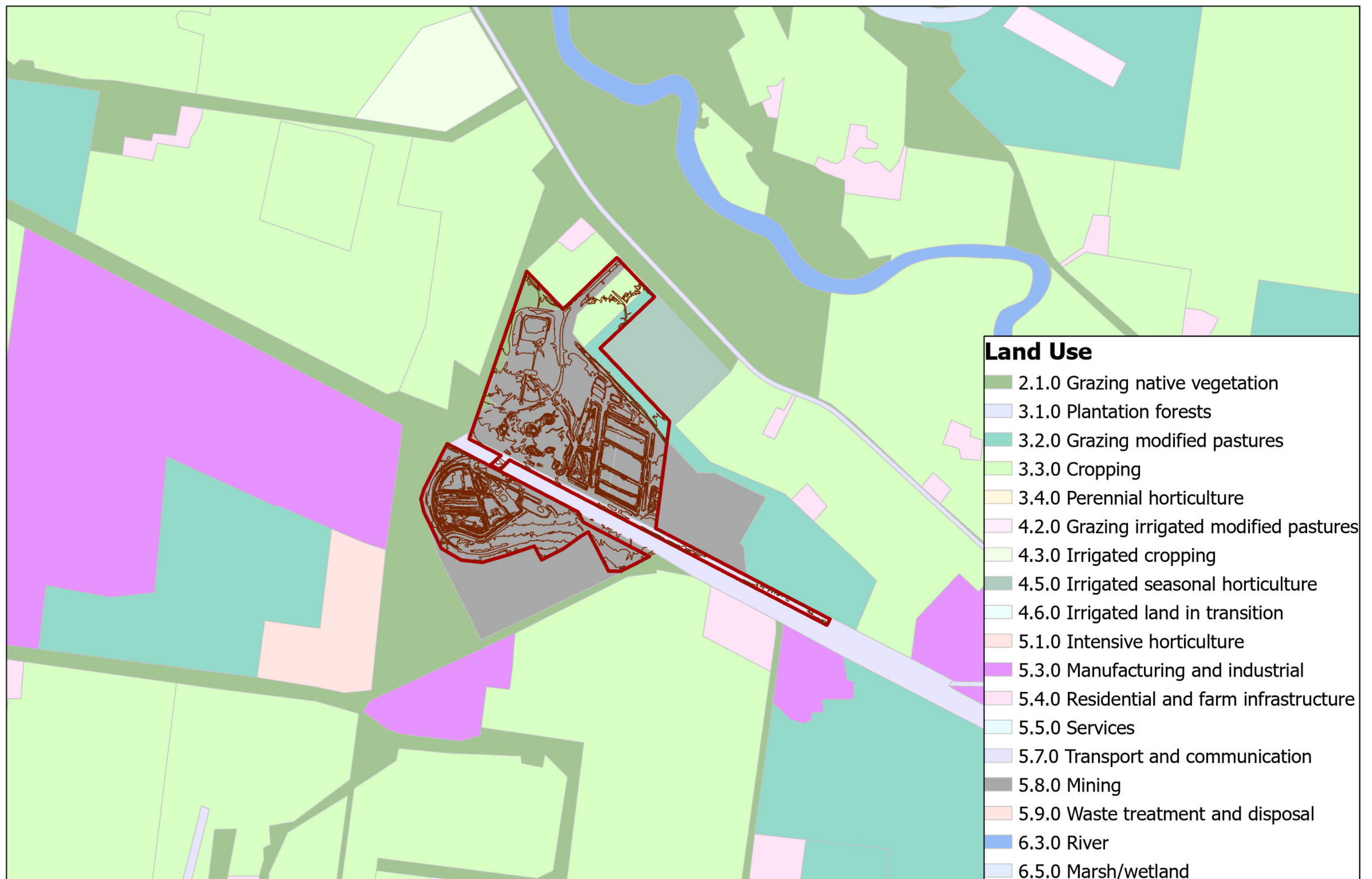
1.3.2 HISTORIC AND CURRENT LAND USE

The Gunnedah CHPP is located on the Werris Creek Mungindi Railway siding in Gunnedah. The rail siding was previously used by the historic Gunnedah Colliery for coal loading and transport.

	WHITEHAVEN GOC	Document Owner:	Env Advisor
		Document Approver:	Env Superintendent
		Revision Period:	3 years
		Issue:	1
		Last Revision Date:	December 2023
WHC-PLN-OC-CHPP- Rehabilitation Management Plan			

Land use surrounding the CHPP is a mix of agriculture and medium industry. Agriculture is predominantly cropping with some domestic grazing. Industry consists of an animal feed company producing horse feed that is located on the south eastern border of CHPP operational boundary, and a leather processing operation is located 600m to the south.

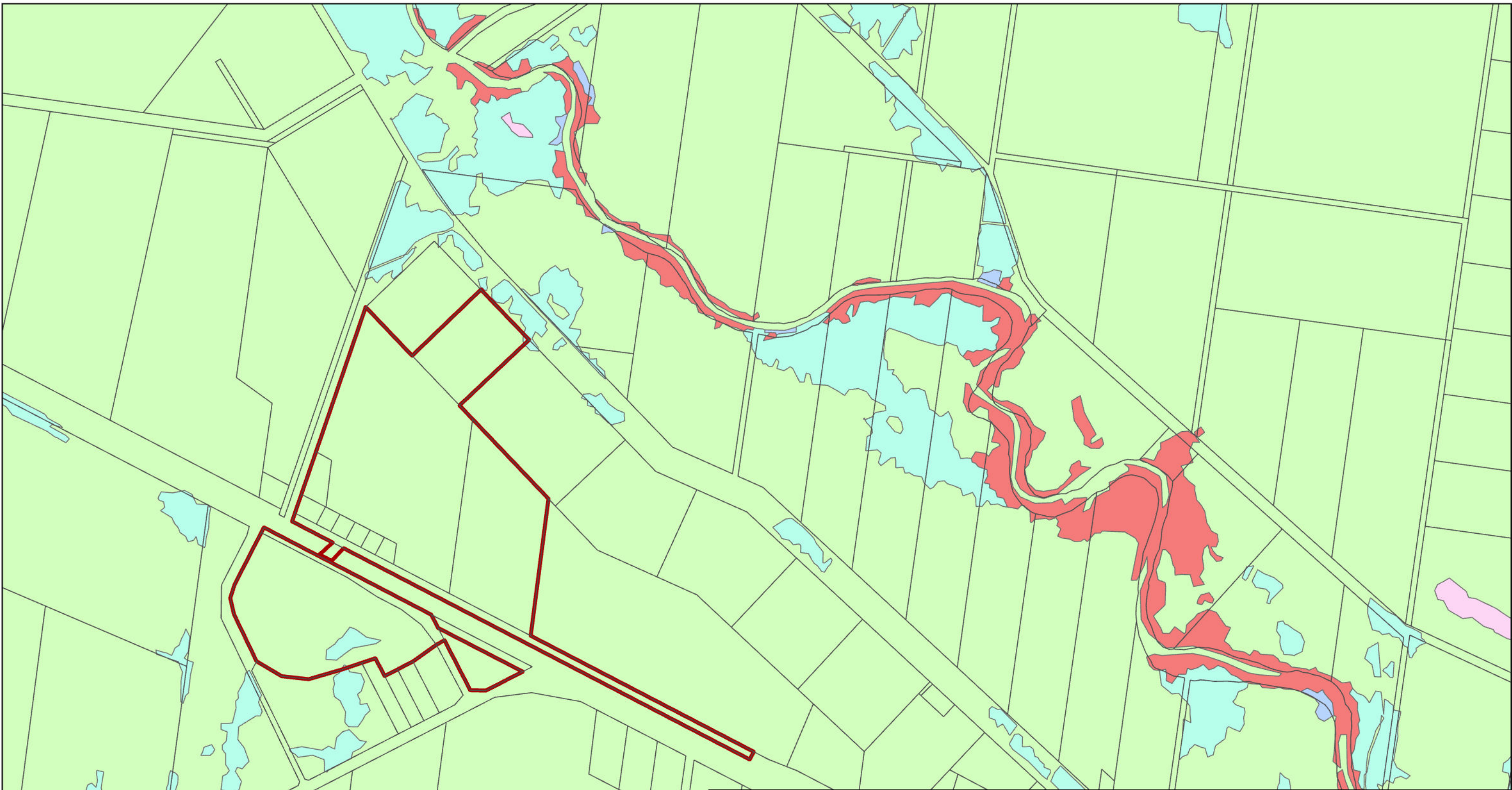
To the north of the CHPP is the Kamilaroi Highway which gives access to site. The Namoi River occurs 400m to the north of the site.



Gunnedah CHPP Land Use

Figure 4

CHPP Project Boundary
 Surface Contours 1m



- Regional Vegetation Mapping**
- Plant Community Type**
- Not classified
 - Black Tea-tree - River Oak - Wilga riparian low forest/shrubland wetland of rich soil depressions in the Brigalow Belt South Bioregion
 - Narrow-leaved Ironbark - cypress pine - White Box shrubby open forest in the Brigalow Belt South Bioregion and Nandewar Bioregion
 - Poplar Box - Yellow Box - Western Grey Box grassy woodland on cracking clay soils mainly in the Liverpool Plains, Brigalow Belt South Bioregion
 - River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion
 - Shallow freshwater wetland sedge/land in depressions on floodplains on inland alluvial plains and floodplains
 - White Box - White Cypress Pine - Silver-leaved Ironbark grassy woodland on mainly clay loam soils on hills mainly in the Nandewar Bioregion
 - White Box grassy woodland to open woodland on basalt flats and rises in the Liverpool Plains sub-region, BBS Bioregion

Gunnedah CHPP Vegetation Communities

	WHITEHAVEN GOC	Document Owner:	Env Advisor
		Document Approver:	Env Superintendent
		Revision Period:	3 years
		Issue:	1
		Last Revision Date:	December 2023
WHC-PLN-OC-CHPP- Rehabilitation Management Plan			

1.3.3 FUTURE LAND USE

The post-mining land use will be mixture of industrial (rail, freight), and agricultural (grazing & cropping) **Figure 6**.

Final landform will be taken as far as practical to original ground level prior to mining activities, with natural drainage towards the Namoi River. All tailings' facilities, dams and infrastructure will be removed, contamination testing undertaken and backfilled. The Fresh water dam in the rail loop will be maintained.

Rail Infrastructure

The rail loop will be returned to Gunnedah Shire Council after contamination testing and any required remediation works completed.

The historic rail siding will undergo contamination testing and remediation as required.

Tailings Facilities

Tailing's facilities include settling ponds, sedimentation dams and associated infrastructure and roads.

Final land use for these areas will be grazing with local grasses, and with scattered trees.

Coal Processing Areas

This includes the ROM Pad, reclaim tunnel rail loading facility with bin, main processing plant infrastructure, office blocks and store facilities, Main Storage Dams.

Final land use for these areas will be grazing with a potential for cropping.

	WHITEHAVEN GOC	Document Owner:	Env Advisor
		Document Approver:	Env Superintendent
		Revision Period:	3 years
		Issue:	1
		Last Revision Date:	December 2023
		WHC-PLN-OC-CHPP-REHABILITATION MANAGEMENT PLAN	

2 **FINAL LAND USE**

2.1 **REGULATORY REQUIREMENTS FOR REHABILITATION**

Regulatory approval for the area is covered by the April 2008 Statement of Environmental Effects and project DA 0079.2002 September 2022.

The regulatory requirements specific to post mining land use, rehabilitation, and closure at Gunnedah CHPP are summarised in **Table 4**.

Table 4 Regulatory Requirements Rehabilitation

.	Requirement	Domain	Timing	Section Addressed	
Development Consent DA 0079.2002					
Schedule 3, Condition 7	The Applicant must rehabilitate the site to the satisfaction of the Secretary. This rehabilitation must be generally consistent with the proposed rehabilitation strategy described in the EIS and comply with the objectives in Table 1A below.		All	Life of Operation	Section 4 Section 6
	Table 1A: Rehabilitation Objectives				
	Feature	Objective			
	All areas of the site affected by the development	<ul style="list-style-type: none">Safe, stable and non-pollutingFinal land use compatible with surrounding land uses			
	Surface Infrastructure	<ul style="list-style-type: none">To be decommissioned, unless the Secretary agrees otherwise			

	WHITEHAVEN GOC	Document Owner:	Env Advisor
		Document Approver:	Env Superintendent
		Revision Period:	3 years
		Issue:	1
		Last Revision Date:	December 2023
		WHC-PLN-OC-CHPP-REHABILITATION MANAGEMENT PLAN	

Environmental Performance and Management				
2. Air Quality	b) minimise the surface disturbance on site and revegetate disturbed areas as soon as practicable; to the satisfaction of the Secretary.			6.3.5

	WHITEHAVEN GOC	Document Owner:	Env Advisor
		Document Approver:	Env Superintendent
		Revision Period:	3 years
		Issue:	1
		Last Revision Date:	December 2023
WHC-PLN-OC-CHPP-REHABILITATION MANAGEMENT PLAN			

2.2 FINAL LAND USE OPTIONS ASSESSMENT

Final land use will be in line with consent conditions (Section 3.7) that all infrastructure will be remove. Rehabilitation of the site will be to allow for future landholder to use the site in line with surround land use light industrial and agriculture.

Future land option would be to leave workshop, offices and training centre for future land holder to utilise. This and other options will be will be **assessed** within year of planned cessation of operations on the site and be part of negotiations with potential future landholders.

2.3 FINAL LAND USE STATEMENT

The overall closure goal for the Gunnedah CHPP is threefold: Firstly, remove all carbonaceous material and any potential contamination. Secondly, to return disturbed areas back to original landform with drainage towards the Namoi River. Thirdly rehabilitate disturbed areas to a state of pastoral agriculture.

Site will be returned to original pre-operational landform with no additional water storages, tailings, reject facilities or contamination on site. There have been no excavations that intercept the underlying groundwater. These actions will remove any residual water risks.

2.4 FINAL LAND USE AND MINING DOMAINS

2.4.1 FINAL LAND USE DOMAINS

Final land use domains are defined as land management units characterised by similar final land use objectives. Each final land use domain will require specific rehabilitation methods.

The final land use domains are based on RR Mine Rehabilitation Portal Guideline (1 Sept 2022). Applicable final land use domains are presented in Table 5 and shown on the Final Landform and Rehabilitation Plan (refer **Figure 6**).

Table 5 Final Land Use Domains

Code	Final Land Use Domain	Description
B	Agricultural - Grazing	Areas rehabilitated with A mixture of native and pasture species to a rural land capability of (at least) Class VI, suitable for grazing land use.
E	Industrial	Rail loop belonging to Gunnedah Shire Council
F	Water management areas	The network of dams and water management structures retained in the final landform. Dams will provide water resources for grazing areas and native fauna.
I	Infrastructure	Infrastructure to be retained following relinquishment including roads

	WHITEHAVEN GOC	Document Owner:	Env Advisor
		Document Approver:	Env Superintendent
		Revision Period:	3 years
		Issue:	1
		Last Revision Date:	December 2023
WHC-PLN-OC-CHPP-REHABILITATION MANAGEMENT PLAN			

2.4.2 MINING DOMAINS

Mining domains identify the footprint of areas disturbed for mining related activities. For the purpose of this Plan, mining domains have been defined as the set of discrete areas that have a particular operational or functional purpose, therefore having similar geophysical and geochemical characteristics that will have similar rehabilitation requirements.

Mining domains are presented in **Table 6**.

Table 6 Mining Domains

Code	Mining Domain	Description
1	Infrastructure Area	Includes workshop and offices, training centre, main bitumen access roads and site unsealed roads
2	Tailings Storage Facility	Settling ponds and sedimentation dams and associated infrastructure
3	Water Management Area	The network of clean water and dirty water dams and associated drains and bunding infrastructure used for operational water management.
7	Beneficiation Facility	ROM Pad, reclaim tunnel, coal loading facility, coal processing plant

	WHITEHAVEN GOC	Document Owner:	Env Advisor
		Document Approver:	Env Superintendent
		Revision Period:	3 years
		Issue:	1
		Last Revision Date:	December 2023
WHC-PLN-OC-CHPP-REHABILITATION MANAGEMENT PLAN			

3 **REHABILITATION RISK ASSESSMENT**

3.1 **SUMMARY OF RISK ASSESSMENTS**

Multiple risk assessments have been completed historically for the rehabilitation works associated with CHPP. Based on review of historic documentation, **Table 7** summarises the identified risk assessments.

Table 7 Summary of Risk Assessments

Date	Risk Assessment	Details
Sept 2021	Gunnedah Open Cut Broad Brush Risk Assessment (BBRA)	BBRA review to review material risks and controls.
3 May 21	Gunnedah Open Cut Bowtie Risk Assessment	Bow Tie risk assessment for closed mine environmental risks
31 March 23	Gunnedah CHPP Rehabilitation Risk Assessment	A risk assessment was conducted to identify the key issues that presented a risk to achieving satisfactory rehabilitation and inform the preparation of the RMP.

3.2 **REHABILITATION RISK ASSESSMENT**

A risk assessment workshop was undertaken on 22 February 2023. The workshop was used to identify the key issues that presented a risk to achieving satisfactory rehabilitation.

The risk assessment included key Whitehaven personnel and was undertaken in accordance with AS/NZS ISO 31000:2018 Risk Management – Guidelines, the Risk Management Handbook for the Mining Industry (MDG1010). Whitehaven's Risk Matrix was used to calculate the consequence and likelihood of an event and to evaluate the subsequent risk level (risk rank).

The risk assessment has been used to inform the preparation of this Plan. The objectives of the risk assessment were to:

- Identify the risks associated with rehabilitation and closure to achieve the approved post mining land uses;
- Identify knowledge gaps in Whitehaven's current understanding of the risks to rehabilitation;
- Identify the investigations/controls/action plans necessary to effectively mitigate risks and/or realise opportunities and to close any identified knowledge gaps;
- Inform the development of this RMP, to provide a basis to determine additional investigations and/or project works to be undertaken; and
- Provide the framework to satisfy relevant internal and government guidelines, requiring implementation of a risk-based approach to closure.

The risk workshop assessed a total of 57 key rehabilitation risks, which are summarised as:

	WHITEHAVEN GOC	Document Owner:	Env Advisor
		Document Approver:	Env Superintendent
		Revision Period:	3 years
		Issue:	1
		Last Revision Date:	December 2023
WHC-PLN-OC-CHPP-REHABILITATION MANAGEMENT PLAN			

- 18 risks were ranked as not applicable;
- 2 risks were ranked as insignificant
- 23 risks were ranked as minor;
- 8 risks were ranked as medium;
- 0 risk were ranked as high; and
- 0 risks were ranked as critical.

Rehabilitation risks, controls and proposed controls will regularly be reviewed and revised (as required)

3.2.1 SPECIFIC RISKS RELATING TO REHABILITATION

There were no high or critical risks to successful rehabilitation and associated risk controls identified during the workshop. Key risk relating decommissioning and final rehabilitation are summarised in Table 8. The outcomes of the risk assessment workshop have been used to inform the preparation of this Plan.

Table 8 Key Rehabilitation Risks and Identified Controls

Risk Rating	Key Risk	Key Controls	Sections Addressed
Medium	Insufficient skills and experience of rehabilitation personnel	Experienced Whitehaven personnel including Environmental Team Experience Operators within Whitehaven and external contractors when required Experienced team engaged to develop the RMP Training and competencies of personnel working on rehabilitation projects and operations Quality assurance process for rehabilitation Specialist consultants and contractors re engaged as required Survey and GPS guidance on machinery Weekly and monthly planning meetings Budget process	Section 10 Section 7 Section 8.3.1

	WHITEHAVEN GOC	Document Owner:	Env Advisor
		Document Approver:	Env Superintendent
		Revision Period:	3 years
		Issue:	1
		Last Revision Date:	December 2023
WHC-PLN-OC-CHPP-REHABILITATION MANAGEMENT PLAN			

Medium	Adverse impacts to water quality during removal of water management structures without consideration of impacts to sediment structures	Water Management Plan	Section 4.3 Section 4.4 Section 6.3.1 Section 6.3.3 Section 10
Medium	Adverse geochemical/chemical composition of tailings material leading to leaching into soil / groundwater	Characterisation of coal and rejects Groundwater quality and quantity testing Sampling and testing of tailings ponds materials Water management plan includes location of clean and dirty water sources on site Coal/tailings is currently stored in designated areas as per site plan	Section 6.3.1 Section 6.3.2 Section 6.3.3 Section 6.3.4
Medium	No approved final land use	Develop final land use in consultation with regulators	Section 2

3.2.2 FURTHER STUDIES / ACTION PLAN

Proposed controls and further studies were identified during the risk assessment workshop. Table 9 presents an action plan for implementation of the additional risk controls (including high and extreme risks).

Table 9 Further Studies / Action Plan

Risk Rating	Risk	Proposed Control / Study	Timeframe
Medium	Adverse geochemical/chemical composition of tailings material leading to leaching into soil / groundwater	I. Complete soil testing for contamination at depth II. Complete analysis of tailings material (including metals content)	Dec 2024
Medium	Insufficient skills and experience of rehabilitation personnel	I. Ensure availability of experienced operators to complete rehabilitation work	Around May 25

	WHITEHAVEN GOC	Document Owner:	Env Advisor
		Document Approver:	Env Superintendent
		Revision Period:	3 years
		Issue:	1
		Last Revision Date:	December 2023
WHC-PLN-OC-CHPP-REHABILITATION MANAGEMENT PLAN			

		I. Ensure availability of experienced personnel to complete rehabilitation design	
Medium	Adverse impacts to water quality during removal of tailings materials from site	I. Develop final land use in consultation with regulators	Prior to decommissioning tailing facilities
Medium	No approved final land use	I. Erosion and sedimentation control plan to be developed	Final Land use proposed in this RMP.

4 **REHABILITATION OBJECTIVES AND REHABILITATION COMPLETION CRITERIA**

4.1 **DA 0079.2002 REQUIREMENTS**

In accordance with Schedule 3 Condition 7 DA 0079.2002 (as modified), Whitehaven will:

- a. The Applicant must rehabilitate the site to the satisfaction of the Secretary. This rehabilitation must be generally consistent with the proposed rehabilitation strategy described in the EIS and comply with the objectives in Table 10 below.

Table 10 Rehabilitation Objectives

Feature	Objective
All areas of the site affected by the development	<ul style="list-style-type: none"> Safe, stable and non-polluting. Free from contamination with site suitable for pre operations land use. Contamination with NEMP HIL's guideline levels for designated final land use. Final land use compatible with surrounding land uses
Surface Infrastructure	<ul style="list-style-type: none"> To be decommissioned, unless the Secretary agrees otherwise
Water quality	<ul style="list-style-type: none"> Water retained on the site is fit for the intended post development land use Water discharged from the site is suitable for receiving waters
Community	<ul style="list-style-type: none"> Ensure public safety Minimise adverse socio-economic effects associated with the closure of the development

	WHITEHAVEN GOC	Document Owner:	Env Advisor
		Document Approver:	Env Superintendent
		Revision Period:	3 years
		Issue:	1
		Last Revision Date:	December 2023
WHC-PLN-OC-CHPP-REHABILITATION MANAGEMENT PLAN			

4.2 SPECIFIC REHABILITATION OBJECTIVES

In order to achieve the broad rehabilitation objectives presented in DA 0079.2002, the following short-term and long-term rehabilitation objectives have been adopted.

4.2.1 SHORT-TERM REHABILITATION AND CLOSURE OBJECTIVES

Short-term rehabilitation and closure objectives include:

- Maintain site topsoil stockpiles
- to stabilise all earthworks, drainage lines and disturbed areas in order to minimise erosion and sedimentation; and
- control weeds.

4.2.2 LONG-TERM REHABILITATION AND CLOSURE OBJECTIVES

Long-term rehabilitation and closure objectives include:

- Remove all carbonaceous material from settling and sedimentation ponds,
- Undertake contamination testing and remove any contamination or carbonaceous material area;
- Backfill all mine water management structures;
- to monitor rehabilitation success in terms of physical and biological parameters; and
- to achieve relinquishment status of rehabilitated and decommissioned areas.

4.3 DOMAIN REHABILITATION OBJECTIVES

In order to achieve the broad rehabilitation objectives presented in DA 0079.2002, Whitehaven have developed specific domain rehabilitation objectives.

The key rehabilitation objectives for each of the domains are defined in **Table 11**.

Table 11 Rehabilitation Domain Objectives

Mining Domain	Final Land Use Domain	Rehabilitation Objective
B	Agricultural – Grazing	<p>Pasture areas with characteristics comparable with surrounding grazed farm land will be established across all disturbed areas.</p> <p>Grazing rehabilitation areas will comply with (at least) a Rural Land Capability of Class VI. Management inputs required to sustain grazing will be in the range of analogue sites.</p> <p>Where suitable, pasture areas will be fence with stock proof fencing.</p>
E	Industrial	Decontaminate the northern rail loop, and relinquish the lease back to owner.

	WHITEHAVEN GOC	Document Owner:	Env Advisor
		Document Approver:	Env Superintendent
		Revision Period:	3 years
		Issue:	1
		Last Revision Date:	December 2023
WHC-PLN-OC-CHPP-REHABILITATION MANAGEMENT PLAN			

Mining Domain	Final Land Use Domain	Rehabilitation Objective
F	Water management areas	<p>Remaining fresh water dam will be desilted as required. All other water storages and earthen drains will be backfilled, made free draining and rehabilitated back to original ground as far as practical.</p> <p>The final landform water management will not adversely impact downstream water users. Water sources and dependent ecosystems will be protected so as not to impact on basic landholder rights. Water harvestable rights will be according to NSW legislation.</p>
I	Infrastructure	<p>Retained infrastructure will be limited to sealed roads for site access by post closure land holder.</p> <p>All other infrastructure will be removed.</p>

4.4 **REHABILITATION COMPLETION CRITERIA**

Completion criteria are objective target levels or values assigned to a variety of indicators (e.g., slope, species diversity, percent groundcover), which can be measured to demonstrate progress and ultimate success of rehabilitation. As such, they provide a defined end point, at which point in time rehabilitation can be deemed successful and the lease relinquishment process can proceed. The rehabilitation completion criteria for all areas of Gunnedah CHPP are listed in Table 12.

These completion criteria will be utilised to demonstrate achievement of rehabilitation objectives. It is noted that the completion criteria may be subject to refinement as rehabilitation progresses, including as a result of ongoing consultation with the relevant stakeholders, studies yet to be completed and continuous improvement process informed by rehabilitation monitoring results. The achievement (or otherwise) of the completion criteria will be monitored and reported as required.

Completion criteria have been informed by the following information:

- Relevant conditions of DA 0079.2002;
- The Department of Regional NSW – Mining, Exploration & Geosciences (DRNSW – MEG) rehabilitation guideline documents including:
- Form and way: Rehabilitation objectives, rehabilitation completion criteria and final landform and rehabilitation plan for large mines;
- Guideline: Rehabilitation objectives and rehabilitation completion criteria; and
- Similar rehabilitation projects.



WHITEHAVEN GOC

Document Owner:	Env Advisor
Document Approver:	Env Superintendent
Revision Period:	3 years
Issue:	1
Last Revision Date:	December 2023

WHC-PLN-OC-CHPP-REHABILITATION MANAGEMENT PLAN

Table 12 Rehabilitation completion criteria

Final Land Use Domain	Mining Domain	Rehabilitation Objective (describe the desired feature and/or characteristics of the final land use domain)	Indicator (specific attribute associated with the objective)	Rehabilitation Completion Criteria (benchmark for the indicator, based on analogue data where appropriate)	Example Justification Validation Method (evidence that the benchmark has been achieved)
Phase 1 - Decommissioning					
Infrastructure Areas					
Agricultural – Grazing (Rehabilitation Area – Pasture)	Infrastructure	All surface infrastructure has been decommissioned and removed, unless approved otherwise by the Secretary	Removal of all services (power, water, communications) that have been connected on the site as part of the operation.	All utility infrastructure removed.	Statement provided, utility service disconnection record / notification
			Demolition and removal of all surface infrastructure that is not required for the final land use. Removal or capping off of any services connected to buildings.	Infrastructure removed.	Statement provided Demolition records As-constructed final landform
			Removal of all concrete footings, foundations, and pavements	All concrete footings, foundations and pavements have been removed to avoid exposure pathways to subsequent final land use.	Statement provided Demolition records Surveyed and marked on the as-constructed final landform plan.
Infrastructure	Infrastructure	Retention of infrastructure (if applicable): All infrastructure that is to remain as part of the final land use is safe and does not pose any hazard to the community and is approved by the Secretary for retention.	Potential hazards (e.g., electrical, mechanical) have been effectively isolated and secured	Hazards isolated and secured.	Statement provided by suitably qualified engineer.
			Damage to access tracks has been repaired and stabilised.	Repairs complete.	As-constructed final landform plan, photos etc.
			Appropriate approvals have been sought and granted for retained infrastructure	Approval in place	Approval from the Secretary
Agricultural – Grazing (Rehabilitation Area – Pasture) And Industrial	Infrastructure	All hazardous and contaminated materials are appropriately removed or remediated in accordance with the recommendations of a contamination site assessment.	Waste material and/or visible contamination areas on site surface.	There are no visible signs of contamination following the removal of plant, equipment, and materials. All rubbish/ waste materials have been removed from site.	Statement provided and before/after photos. Waste disposal records
			Soil testing for contaminants of concern as listed by Health Investigation Level of the National Environment Protection (Assessment of Site Contamination) Measure (1999) (NEPM) applicable to land use type.	Contamination has been appropriately remediated, removed or managed so that appropriate guidelines for land use are met, e.g., Health Investigation Level (HIL) or Ecological Investigation Level (EIL) of the NEPM (1999).	Contamination Remediation Report prepared by suitable qualified person Site Contamination Audit Report and Site Audit Statement prepared by EPA Accredited Auditor (where required).
			Carbonaceous material is removed from the footprint of the infrastructure areas	Any carbonaceous material has been removed from the footprint of the infrastructure areas transported off site to approved location.	Photographs, Rehabilitation monitoring reports, as-constructed surveys, quality assurance records.



WHITEHAVEN GOC

Document Owner: Env Advisor

Document Approver: Env Superintendent

Revision Period: 3 years

Issue: 1

Last Revision Date: December 2023

WHC-PLN-OC-CHPP-REHABILITATION MANAGEMENT PLAN

Final Land Use Domain	Mining Domain	Rehabilitation Objective (describe the desired feature and/or characteristics of the final land use domain)	Indicator (specific attribute associated with the objective)	Rehabilitation Completion Criteria (benchmark for the indicator, based on analogue data where appropriate)	Example Justification Validation Method (evidence that the benchmark has been achieved)
Water Management Area					
Water management	Water management	All water management infrastructure has been decommissioned and removed, unless approved otherwise by the Secretary	Removal of all water management infrastructure (including pumps, pipes and power).	Infrastructure removed.	Statement provided and before/after photos.
Water management Agricultural – Grazing (Rehabilitation Area – Pasture)	Water management	Domain stable, limited groundwater seepage and non-polluting	Site fresh water dam is desilted and decontaminated prior to conversion to clean water dams or backfilling and regrading into in the final landform.	Sediment accumulated in mine water and sediment dams is removed and take off site if containing carbonaceous material, supported by records.	Statement provided and before/after photos. Monitoring Rehabilitation records
All other mining domains					
All domains	All domains	All surface infrastructure, plant and equipment has been decommissioned and removed, unless approved otherwise by the Secretary	Removal of all plant, equipment and associated equipment from the footprint of mining areas	Infrastructure and equipment (including mobile equipment) removed	Statement provided Demolition /decommissioning records As-constructed final landform
Phase 2 – Landform Establishment					
All domains					
All domains	All domains	Stable and permanent landform established	Landforms are surveyed and demonstrated to be free draining.	Survey verifies final landform are free draining integrated into surrounding landscape.	As constructed surveys, drainage modelling.
			Landform stability and erosion	Survey or remote sensing of the rehabilitated landforms shows an absence of slumping that could compromise stability.	Survey or remote sensing monitoring, Annual rehabilitation monitoring.
		Final Landform non-polluting	No polluted or contaminated runoff from the landform	Water quality measured at discharge points and downstream monitoring locations meets guidelines, no impact between received run-on and water leaving site.	Observation post rainfall Water quality sampling and analyses as per the approved <i>Water Management Plan</i>
		Final landform blends with the surrounding topography	Visual assessment and as constructed survey	Visual assessments and as constructed survey verifies the regraded landform blends with the surrounding topography	Before / after photographs As constructed survey
Water Management Areas					
Water Management Area	Water Management Area	Domain stable and non-polluting	Redundant water management structures backfilled	No pooling of water over site following rainfall	Observation/Photographs Rehabilitation monitoring reports
			Remaining water management structures non-polluting	Monitoring indicated that surface water complies with the Water Quality Guidelines (2018) trigger value for livestock (cattle) or analogue monitoring site	Water quality testing as per the approved <i>Site Water Management Plan</i>
		Water Approvals	Water approvals	Site water capture of runoff water is less than 10% of total runoff	Site water catchment plan demonstrates that total water capture on site is within in legal requirements.



WHITEHAVEN GOC

Document Owner: Env Advisor

Document Approver: Env Superintendent

Revision Period: 3 years

Issue: 1

Last Revision Date: December 2023

WHC-PLN-OC-CHPP-REHABILITATION MANAGEMENT PLAN

Final Land Use Domain	Mining Domain	Rehabilitation Objective (describe the desired feature and/or characteristics of the final land use domain)	Indicator (specific attribute associated with the objective)	Rehabilitation Completion Criteria (benchmark for the indicator, based on analogue data where appropriate)	Example Justification Validation Method (evidence that the benchmark has been achieved)
		Structures that take or divert water such as final voids (there is no final void), dams, levees etc. are appropriately licensed (e.g., under the Water Management Act 2000) and where required ensure sufficient licence shares are held in the water source(s) to account for water take.			
Phase 3 – Growth Medium Development					
All Domains					
Agricultural – Grazing (Rehabilitation Area – Pasture)	All domains	Growth media is appropriate to support the final land use	Soil thickness on shaped landform	Rehabilitation records verify that rehabilitation areas topsoiled with a nominal depth of 150 mm, where available.	Rehabilitation records Test pits As constructed survey
			Soil characteristics in the range of pre-mining soil characteristics	Monitoring verifies soil characteristics such as pH, Electrical Conductivity, Exchangeable sodium percentage, nitrogen and phosphorous are in the range of analogue sites or do not appear to be limiting plant performance.	Soil monitoring report outlining the results of physical and laboratory soil tests
			Ameliorant application.	Soil ameliorants (e.g., gypsum, mulch, biosolids, composts) are applied where necessary (supported by records).	Rehabilitation records
		The rehabilitated area does not represent an erosion hazard	Suitable surface water controls installed and operating effectively	Monitoring of water discharged from the Mine complies with guideline levels No identifiable erosion or sedimentation	Water quality testing as per the approved <i>Site Water Management Plan</i> Photographs
Phase 4 – Ecosystem and Land Use Establishment					
All domains					
Agricultural – Grazing (Rehabilitation Area – Pasture)	All domains	Weeds and feral animals do not present a risk to rehabilitation.	Weed presence	Number of weed species and abundance average no greater than 20% more than that of analogue sites	Rehabilitation monitoring reports
			Feral animal density	Monitoring records indicate that feral and pest animal species abundance is no greater than surrounding lands.	Rehabilitation monitoring reports
		Grazing stock is excluded from rehabilitation areas and enrichment zones prior to relinquishment.	Stock exclusion fencing	Rehabilitation areas and enrichment zones are fenced to exclude grazing stock (until stable and grazing will not impact upon its establishment).	Rehabilitation records Photographs
		Erosion does not present a safety hazard or compromise the post-mining land capability.	Erosion control	Visual monitoring indicates there is no significant erosion that compromises land capability or the intended final land use.	Rehabilitation monitoring reports Survey reports (LiDAR, year over year comparison)

	WHITEHAVEN GOC	Document Owner:	Env Advisor
		Document Approver:	Env Superintendent
		Revision Period:	3 years
		Issue:	1
		Last Revision Date:	December 2023
WHC-PLN-OC-CHPP-REHABILITATION MANAGEMENT PLAN			

Final Land Use Domain	Mining Domain	Rehabilitation Objective (describe the desired feature and/or characteristics of the final land use domain)	Indicator (specific attribute associated with the objective)	Rehabilitation Completion Criteria (benchmark for the indicator, based on analogue data where appropriate)	Example Justification Validation Method (evidence that the benchmark has been achieved)
					Annual independent rehabilitation report
				Monitoring verifies there are no gully or tunnel erosion features, or rills >300 mm deep or wide.	Rehabilitation monitoring reports
Agricultural – Grazing (Rehabilitation Area – Pasture)	All domains	Bushfire: The risk of bushfire and impacts to the community, environment and infrastructure has been addressed as part of rehabilitation.	Appropriate bushfire hazard controls (where required) have been implemented on the advice from the NSW Rural Fire Service or bushfire consultant.	Bushfire controls implemented.	Statement provided and before/after photos.
Water Management Area					
Water Management Area	Water Management Area	Domain stable and non-polluting	Water management structures stabilised and capable of retaining and conveying water without causing pollution	No identifiable erosion or sedimentation	Visual inspection Photographs
			Water discharged from site within relevant criteria	Monitoring of water discharged from the Mine complies with guideline limits	Water quality testing as per the approved <i>Water Management Plan</i>
Agricultural – Grazing (Rehabilitation Area – Pasture)					
Agricultural – Grazing (Rehabilitation Area – Pasture)	All domains	Re-establishing agricultural land over the areas disturbed by the mine. Pasture areas will be capable of sustaining grazing with land capability that reflects the pre-mining environment.	Area of pasture rehabilitation	Rehabilitated pasture areas have been sown with a mixture of pasture species including fast growing, short-lived species and perennial grasses and legumes.	Rehabilitation records
			Species selection	Rehabilitation areas comprise a mixture of grasses representative of regionally occurring vegetation where possible. Grasses sown will be selected from appropriate analogue sites.	Rehabilitation records Rehabilitation monitoring reports
			Vegetation establishment	Rehabilitation monitoring records verify that ground cover (vegetation, leaf litter, and mulch) is at least 85%. The first monitoring program will be completed within 12 to 18 months of rehabilitation to quantify pasture crop establishment.	Rehabilitation monitoring reports
				No bare surfaces >20 m ² in area or >10 m in length down slope as indicated by rehabilitation monitoring at Year 5 following establishment.	Rehabilitation monitoring reports Remote sensing (LiDAR)
			Vegetation health	Rehabilitation monitoring shows that pasture health is comparable to analogue sites.	Rehabilitation monitoring reports
Phase 5 – Ecosystem and Land Use Development					
All domains					
All domains	All domains	Weeds are controlled.	Weed presence	Number of weed species and abundance average no greater than 20% more than that of analogue sites	Rehabilitation monitoring reports



WHITEHAVEN GOC

Document Owner: Env Advisor

Document Approver: Env Superintendent


Revision Period: 3 years

Issue: 1

Last Revision Date: December 2023

WHC-PLN-OC-CHPP-REHABILITATION MANAGEMENT PLAN

Final Land Use Domain	Mining Domain	Rehabilitation Objective (describe the desired feature and/or characteristics of the final land use domain)	Indicator (specific attribute associated with the objective)	Rehabilitation Completion Criteria (benchmark for the indicator, based on analogue data where appropriate)	Example Justification Validation Method (evidence that the benchmark has been achieved)
All domains	All domains	Feral animal pests are controlled	Feral animal density	Monitoring records indicate that feral and pest animal species abundance is no greater than surrounding lands.	Rehabilitation monitoring reports
All domains	All domains	Erosion does not present a safety hazard or compromise the post-mining land capability.	Erosion and sediment control	There are no gully or tunnel erosion features and there is an absence of rilling (> 300 mm deep) within each domain.	Rehabilitation monitoring reports
		Monitoring demonstrates soil profile development in rehabilitated areas (e.g., development of organic layer, litter layer).	Soil quality	Soil testing indicates that topsoil soil characteristics (pH, EC [electrical conductivity], ESP) generally meet the following criteria: - pH – between 4.5 and 8.5, or is comparable to relevant analogue sites; - EC - < 1 dS/m, or is comparable to relevant analogue sites; and - ESP – that is comparable to the analogue sites. Where soil testing results indicate values outside the above criteria, rehabilitation monitoring at the relevant area verifies that the soil quality is not inhibiting plant growth.	Soil monitoring and testing reports Rehabilitation monitoring reports. Reports for Rail Loop will be provided to landowner (Gunnedah Shire Council).
			Surface cover	Rehabilitation monitoring records verify that ground cover (vegetation, leaf litter, and mulch) is greater than 85 %.	Rehabilitation monitoring reports
Water Management Area					
Water management areas	Water management areas	Final landform drainage will integrate with surrounding catchments, achieve long-term geomorphic stability and minimise erosion.	Discharge water quality	Discharge water quality meets EPL requirements.	Rehabilitation monitoring reports
			Geomorphic stability	Water management structures are assessed to be stable	Geotechnical reports
			Native overstorey cover		
			Native mid storey cover		
			Native ground cover (grasses)		
Agricultural – Grazing (Rehabilitation Area – Pasture)					
Agricultural – Grazing (Rehabilitation Area – Pasture)	All domains	Pasture areas will be capable of sustaining grazing with land capability that reflects the pre-mining environment and to minimise visual impacts	Species composition	Rehabilitation monitoring verifies that species in pasture rehabilitation areas comprise a mixture of grasses representative of pasture vegetation.	Rehabilitation monitoring records.
			Regeneration	Established species survive and/or regenerate after disturbance	Rehabilitation monitoring records.
				Species are capable of setting viable seed, flowering or otherwise reproducing.	Rehabilitation monitoring records.
			Vegetation health	Rehabilitation monitoring verifies that vegetation health is comparable to reference sites.	Rehabilitation monitoring records.

	WHITEHAVEN GOC	Document Owner:	Env Advisor
		Document Approver:	Env Superintendent
		Revision Period:	3 years
		Issue:	1
		Last Revision Date:	December 2023

WHC-PLN-OC-CHPP-REHABILITATION MANAGEMENT PLAN

Final Land Use Domain	Mining Domain	Rehabilitation Objective <i>(describe the desired feature and/or characteristics of the final land use domain)</i>	Indicator <i>(specific attribute associated with the objective)</i>	Rehabilitation Completion Criteria <i>(benchmark for the indicator, based on analogue data where appropriate)</i>	Example Justification Validation Method <i>(evidence that the benchmark has been achieved)</i>
			Land capability	Pasture areas are assessed to have a Rural Land Class VI or better (capable of sustaining grazing), consistent with the final landform.	Rehabilitation monitoring records.

	WHITEHAVEN GOC	Document Owner:	Env Advisor
		Document Approver:	Env Superintendent
		Revision Period:	3 years
		Issue:	1
		Last Revision Date:	December 2023
WHC-PLN-OC-CHPP-REHABILITATION MANAGEMENT PLAN			

4.5 REHABILITATION OBJECTIVES AND REHABILITATION COMPLETION CRITERIA – STAKEHOLDER CONSULTATION

4.5.1 STAKEHOLDER ENGAGEMENT PLAN

Gunnedah CHPP has prepared a Stakeholder Engagement Plan (SEP) to facilitate stakeholder consultation for the CHPP's rehabilitation objectives and completion criteria. This document details CHPP's stakeholders and the strategies used to communicate with them and provide the foundation for working with stakeholders prior to and during the closure process. The SEP will be regularly revised to reflect the outcomes of technical investigations, the ongoing development and execution of this RMP and the outcomes of ongoing engagement.

The following regulatory agencies and landholders will be consulted with as part of final rehabilitation.

Relevant Statutory Authorities

Whitehaven has consulted with and will continue to consult with the following regulatory bodies in relation to the CHPP, rehabilitation and completion criteria:

- Resource Regulator - Mineral Resources.
- Environment Protection Authority NSW (EPA);
- Department of Planning and Environment - Water.
- Department of Planning and Environment (DPE)
- Transport for NSW;
- Gunnedah Shire Council

Other Key Stakeholders

Consultation will continue with a number of community groups and landholders in relation to the CHPP operations and rehabilitation, including:

- Surrounding residents
- Employees

4.5.2 PROPOSED FUTURE CONSULTATION

Consultation will continue with stakeholders during the life of mine, in accordance with the SEP. **Table 13** presents a summary of the proposed future consultation activities key stakeholders.

Table 13 Summary of proposed future stakeholder engagement activities

Stakeholder	Activities
RR	Development of RR rehabilitation MP on issue of a mining lease for the site. Annual Rehabilitation Report against any issued Mineral lease
DPE	Ongoing revisions of the RMP Rehabilitation and Mine Closure Progress
DPE Water	Submission of the RMP for comment, and any subsequent revisions.

	WHITEHAVEN GOC	Document Owner:	Env Advisor
		Document Approver:	Env Superintendent
		Revision Period:	3 years
		Issue:	1
		Last Revision Date:	December 2023
WHC-PLN-OC-CHPP-REHABILITATION MANAGEMENT PLAN			

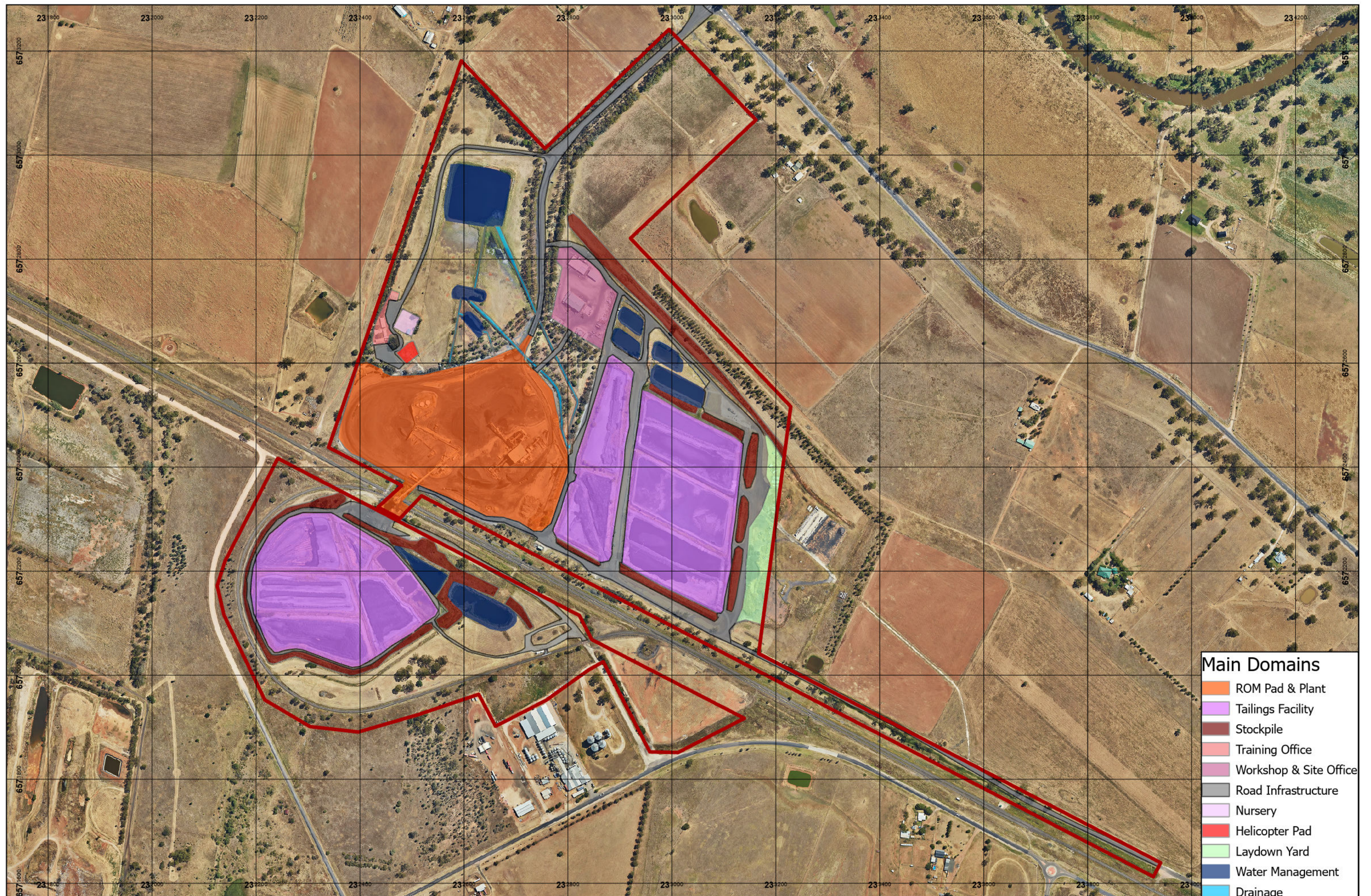
Stakeholder	Activities
Gunnedah Shire Council	Submission of the RMP for comment, and any subsequent revisions.
EPA	Submission of the RMP for comment, and any subsequent revisions.
Stakeholder and Community Interest Groups	Ongoing revisions of the RMP Rehabilitation and Mine Closure Progress

	WHITEHAVEN GOC	Document Owner:	Env Advisor
		Document Approver:	Env Superintendent
		Revision Period:	3 years
		Issue:	1
		Last Revision Date:	December 2023
WHC-PLN-OC-CHPP-REHABILITATION MANAGEMENT PLAN			

5 **FINAL LANDFORM AND REHABILITATION PLAN**

5.1 **FINAL LANDFORM AND REHABILITATION PLAN – ELECTRONIC COPY**

In accordance with the requirements of the RR a *Form and Way: Rehabilitation Management Plan for Large Mines* (RR, 2021a) and a *Final Landform and Rehabilitation Plan* has been prepared to show the proposed final land use and final landform for Gunnedah CHPP (refer **Figure 6** Final Landform and Rehabilitation Plan 1 and **Figure 7** Final Landform and Rehabilitation Plan 2).



- Main Domains**
- ROM Pad & Plant
 - Tailings Facility
 - Stockpile
 - Training Office
 - Workshop & Site Office
 - Road Infrastructure
 - Nursery
 - Helicopter Pad
 - Laydown Yard
 - Water Management
 - Drainage

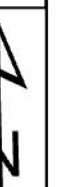


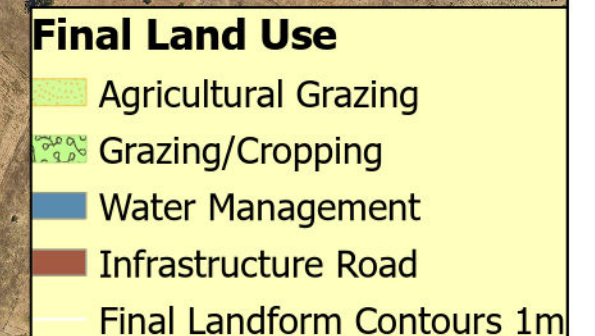
Datum: MGA Zone 56 **Author:** A.Raal **Image:** March 23
Date: Sept 23 **Size/Scale:** 1:6,500 (A3)

Gunnedah CHPP Rehabilitation Domains

Figure 7

CHPP Project Boundary





	WHITEHAVEN GOC	Document Owner:	Env Advisor
		Document Approver:	Env Superintendent
		Revision Period:	3 years
		Issue:	1
		Last Revision Date:	December 2023
WHC-PLN-OC-CHPP-REHABILITATION MANAGEMENT PLAN			

6 REHABILITATION IMPLEMENTATION

6.1 LIFE OF MINE REHABILITATION SCHEDULE

Progressive rehabilitation is limited to;

- Maintaining laydown yards
- Removal of redundant infrastructure
- Maintaining topsoil stockpiles
- Weed control.
- Improvement of site drainage
- Closure planning and transfer of infrastructure assets.

6.1.1 INFRASTRUCTURE

Future planned infrastructure is a Clean Water Dam that will be located just above the Main Storage Dam to hold clean water from River and bore extraction.

On cessation of operations currently planned for October 2026. The following activities will be undertaken. Infrastructure decommissioned and dismantled to prepare land for rehabilitation including removal of built infrastructure, foundation and hardstand materials, services, equipment and materials including wastes and contamination.

The indicative timeline of rehabilitation and decommissioning activities are shown in **Table 14** and further details are provided in **Section 6.2**.

Table 14 Indicative Timeline of Rehabilitation and Decommissioning Infrastructure

2026	2027
<ul style="list-style-type: none"> • Disconnection and termination of services (e.g., water and electricity). Complete • Removal of piping and pumping infrastructure 	<ul style="list-style-type: none"> • Dismantle and removal of infrastructure that is to be utilised on other operational sites e.g., coal processing facility
2028	Ongoing
<ul style="list-style-type: none"> • Decommissioning of any residual infrastructure not being retained, and on-site remediation of any remaining contaminated areas. • Decommissioning of internal access roads/tracks that are no longer required. • Transfer of rail loop back to GSC • Removal of site offices and training center 	<ul style="list-style-type: none"> • Decommissioning and rehabilitation of water infrastructures that are not being retained as part of the final landform



WHITEHAVEN GOC

Document Owner:	Env Advisor
Document Approver:	Env Superintendent
Revision Period:	3 years
Issue:	1
Last Revision Date:	December 2023

WHC-PLN-OC-CHPP-REHABILITATION MANAGEMENT PLAN

+3033: after rehabilitation criteria has been achieved	
<ul style="list-style-type: none"> • Removal of all environmental monitoring stations including three site piezometers in accordance with the requirements of Water Bores in Australia (2020), 	

6.1.2 MINING ACTIVITIES

Coal processing and transport activities are scheduled to cease in October 2026. Processing of coal will cease a few months prior to allow for all remaining product to be shipped off site.

6.1.3 REHABILITATION ACTIVITIES

Rehabilitation activities to be undertaken and indicative timeline is given in Table 15.

Table 15 Indicative Timeline of Rehabilitation and Decommissioning

2026	2027
<ul style="list-style-type: none"> • Undertake initial contamination testing • Shipping of any remaining coal products 	<ul style="list-style-type: none"> • Desilting all sedimentation dams • Decontamination of the rail loop • Removal of all carbonaceous material from rail loop settling and sedimentation ponds. • Transfer of rail loop back to GSC
2028	Ongoing
<ul style="list-style-type: none"> • Removal of all remaining carbonaceous material from site • Backfilling all tailings settling ponds, sedimentation dams and water storage dams • Decommissioning of internal access roads/tracks that are no longer required. • Final contamination testing after site clean up and removal of all carbonaceous material. • Final landform is safe stable, and non-polluting. • Rehabilitation to Ecosystem and land use Establishment established across all relevant disturbed areas of the site. 	<ul style="list-style-type: none"> • Ongoing rehabilitation, monitoring and management. • Decommissioning and rehabilitation of water infrastructures that are not being retained as part of the final landform • Transfer of property to post closure landholder

	WHITEHAVEN GOC	Document Owner:	Env Advisor
		Document Approver:	Env Superintendent
		Revision Period:	3 years
		Issue:	1
		Last Revision Date:	December 2023
WHC-PLN-OC-CHPP-REHABILITATION MANAGEMENT PLAN			

6.2 PHASES OF REHABILITATION AND GENERAL METHODOLOGIES

Achievement of a safe and stable landform that is commensurate with the surrounding topography will be demonstrated through the implementation of a series of conceptual rehabilitation phases. As defined by the *Form and way: Rehabilitation Management Plan (large mines)* the rehabilitation phases are presented in **Table 16**.

Table 16 Rehabilitation Phases

Rehabilitation Phase	Description
Phase 1: Active Mining	This phase is associated with active operations across the domains.
Phase 2: Decommissioning	This phase of rehabilitation includes activities associated with the removal of mining infrastructure, unless agreed to be retained, and the removal, remediation or management of contaminated and hazardous materials.
Phase 3: Landform Establishment	<p>This phase of rehabilitation consists of the processes and activities required to construct the approved final landform.</p> <p>In addition to profiling the surface of rehabilitation areas to the approved final landform profile this phase may include works to construct surface water drainage features, and prepare a substrate with the desired physical and chemical characteristics (that is, rock raking or ameliorating sodic materials).</p>
Phase 4: Growth Medium Development	<p>This phase of rehabilitation consists of activities required to establish the physical, chemical and biological components of the substrate required to establish the desired vegetation community (including short-lived pioneer species) to ensure achievement of the approved or, if not yet approved, the proposed:</p> <ul style="list-style-type: none"> - rehabilitation objectives - rehabilitation completion criteria - final landform and rehabilitation plan. <p>This phase may include spreading the prepared landform with topsoil and/or subsoil and/or soil substitutes, applying soil ameliorants to enhance the physical, chemical and biological characteristics of the growth media, and actions to minimise loss of growth media due to erosion.</p>
Phase 5: Ecosystem and Land Use Establishment	<p>This phase of rehabilitation consists of the processes to establish the final land use following construction of the final landform.</p> <p>For vegetated land uses this rehabilitation phase includes establishing the desired vegetation community and implementing land management activities such as weed control.</p>
Phase 6: Ecosystem and Land Use Development	<p>This phase of rehabilitation consists of the activities to manage maturing rehabilitation areas on a trajectory to achieving the approved or, if not yet approved, the proposed:</p> <ul style="list-style-type: none"> - rehabilitation objectives - rehabilitation completion criteria - final landform and rehabilitation plan. <p>For vegetated land uses this phase may include processes to develop characteristics of functional self-sustaining ecosystems, such as nutrient recycling, vegetation flowering and reproduction, and increasing habitat complexity, and development of a productive, self-sustaining soil profile.</p> <p>This phase of rehabilitation may include specific vegetation management</p>

	WHITEHAVEN GOC	Document Owner:	Env Advisor
		Document Approver:	Env Superintendent
		Revision Period:	3 years
		Issue:	1
		Last Revision Date:	December 2023
WHC-PLN-OC-CHPP-REHABILITATION MANAGEMENT PLAN			

Rehabilitation Phase	Description
	strategies and maintenance such as tree thinning, supplementary plantings and weed management.
Phase 7: Rehabilitation Completion (sign-off)	<p>The final phase of rehabilitation when a rehabilitation area has achieved the final land use for the mining area:</p> <ul style="list-style-type: none"> - as stated in the approved rehabilitation objectives and the approved rehabilitation completion criteria - as spatially depicted in the approved final landform and rehabilitation plan. <p>Rehabilitation areas may be classified as complete when DPE has determined in writing that rehabilitation has achieved the final land use following submission of the relevant application by the lease holder.</p>

6.2.1 ACTIVE MINING PHASE

Coal processing and transport activities are scheduled to cease in October 2026. Processing of coal will cease a few months prior to allow for all remaining product to be shipped off site

Appropriate measures and strategies implemented during the active phase of mining to enhance rehabilitation outcomes. Works in this phase are summarised below.

a. Waste Management

All waste is appropriately sorted and removed from site through dedicated waste contractor. Redundant equipment in the laydown areas has mostly been removed, with ongoing clean-up of used IBC.

b. Geology and Geochemistry

The CHPP surface has not been disturbed more than 8m below surface into subsoils for dams and reclaim tunnel. No hard rock has been mined or dug into, there are no waste stockpiles or substrate requiring geochemical classification.

c. Material Prone to Spontaneous Combustion


Settled tailing in the settling ponds (drying cells) have a small risk of Spontaneous combustion. There is no history of spontaneous combustion at the CHPP. Post cessation of operations all carbonaceous material will be removed from site. There will be no in-situ disposal on site.

d. Material Prone to Generating Acid Mine Drainage

There is no acid producing rock on site. Disturbance has been limited to subsoils

e. Ore Beneficiation Waste Management (Reject and Tailings Disposal)

There are a number of tailings settlement ponds on site in two locations. Within the rail loop and east of the processing facility. All tailings and reject material will be transported off site. There will be no remaining tailing facilities or impoundments on site post rehabilitation.

	WHITEHAVEN GOC	Document Owner:	Env Advisor
		Document Approver:	Env Superintendent
		Revision Period:	3 years
		Issue:	1
		Last Revision Date:	December 2023
WHC-PLN-OC-CHPP-REHABILITATION MANAGEMENT PLAN			

f. Erosion and Sediment Control

Key sources of erosion and sedimentation are generally related to surface water runoff from exposed surfaces, including cleared areas, stockpiles (coal, soil) and unsealed roads, and to a lesser degree caused by wind erosion from tailings facilities.

Erosion and sediment control (ESC) at Gunnedah CHPP is managed in accordance with the Water Management Plan (including an Erosion and Sediment Control Plan), relevant regulatory requirements and the guideline document.

g. Ongoing Management of Biological Resources for Use in Rehabilitation

Biological resources include topsoil stockpiles what are banded, signposted and treated for weeds as required. Local providence seeds are collected and used for rehabilitation. Topsoil is collected and stockpiled from any disturbed areas. Topsoil stockpiles have been sampled for determination of suitability for rehabilitation to pasture. Gypsum and fertilizers (Manure) will be applied as indicated by soil sampling qualities.

h. Mine Subsidence

There are no underground workings or excavations on the site. That could lead to subsidence. Dams and settling ponds that are backfilled will be done in a layered approach and compacted in approximate half metre intervals to reduce settlement, and ensure they are free draining post closure.

i. Management of Potential Cultural and Heritage Issues

There are no identified heritage stie within the operations.

j. Exploration Activities

No exploration activities have been undertaken or are expected to be undertaken.

6.2.2 DECOMMISSIONING

Decommissioning and demolition activities will be planned and documented to ensure that appropriate approvals are in place for the works.

a. Site Security

Site security measures will be implemented during and following the decommissioning process to prevent access by members of the public and secure rehabilitation areas. Site security measures include:

- Locked gates
- Maintenance of existing security fences and signage.

Public safety measures following closure and completion of rehabilitation will be reviewed as part of the relinquishment process.. All water dams within the Whitehaven owned properties will be backfilled reducing liability. There will be no remaining high-risk excavation, dams or tailing facilities post closure.

	WHITEHAVEN GOC	Document Owner:	Env Advisor
		Document Approver:	Env Superintendent
		Revision Period:	3 years
		Issue:	1
		Last Revision Date:	December 2023
WHC-PLN-OC-CHPP-REHABILITATION MANAGEMENT PLAN			

a. Infrastructure to be Removed or Demolished

The final remaining site features, services and structures are to be decommissioned and demolished to achieve the final land use are described in **Table 14**, unless the DPE agrees otherwise.

All demolition work will be carried out in accordance with Australian Standard AS 2601-2001: The Demolition of Structures (or its latest version) and Exploration and Petroleum Drilling and Well Servicing Competencies (DISRD, 2015), as applicable.

b. Buildings, structures and fixed plant to be retained

Following mine closure, it is intended to retain a clean water dam and some access roads. It is expected that any retained water infrastructure would be used for ongoing agricultural purposes (e.g., stock watering) following closure. The northern end of the CHPP which includes the access road and road to the training centre are within flood risk area, as such it is proposed that the seal (bitumen) roads remain post closure for site access by future land holder.

The rail infrastructure namely the rail loop is a leased facility and will be transferred back to the owner after clean-up and any decontamination works of all settling and sedimentation dams, and the rail loop.

Site features, services and structures to be retained for future use as part of the final land use are described in **Table 17**.

Table 17 Infrastructure to be Retained

Code	Mining Domain	Description
1	Infrastructure Area	Sealed Access Roads
2	Rail Loop	Leased infrastructure
3	Water Management Area	Fresh Water Dam in the Rail Loop

The Detailed Mine Closure Planning process conducted over the life of operation, in consultation with DPE, GSC will

- Identify the associated short-term and long-term risks to public safety and the environment from the structures remaining in place, which should identify potential modes of failure
- Address any potential residual risks such as potential for structures to fail
- Engage (where required) a suitably qualified engineer to verify that any risks have been satisfactorily addressed.

c. Management of Carbonaceous/Contaminated Material

a. Carbonaceous Material

All carbonaceous material will be identified and removed from site as per approval conditions.

	WHITEHAVEN GOC	Document Owner:	Env Advisor
		Document Approver:	Env Superintendent
		Revision Period:	3 years
		Issue:	1
		Last Revision Date:	December 2023
WHC-PLN-OC-CHPP-REHABILITATION MANAGEMENT PLAN			

b. Contaminated Material

A final contamination will be completed. Any areas identified will be appropriately remediated. Validation reports will be sent to Gunnedah Shire Council for Section 10.7 Planning Certificates.

d. Hazardous Materials Management

There will be no hazardous material remaining on site post decommissioning and rehabilitation.

e. Underground Infrastructure

There has been no underground mining. Only underground infrastructure is the ROM reclaim tunnel which will be demolished and removed. Costing for demolition and removal is currently in progress.

6.2.3 LANDFORM ESTABLISHMENT

c. Water Management Infrastructure

Elements such as drainage paths, contour drains, ridgelines, and emplacements are shaped, as much as practical, to implement the approved post mining land use. Water management structures are designed to collect surface runoff from rehabilitation or disturbed areas.

Water management structures that will remain following mine closure is detailed in Figure 6.

d. Final Landform Construction: General Requirements

Final landform will be all areas backfilled to original ground level, works include:

e. Final Landform Construction: Reject Emplacement Areas and Tailings Dams

All tailings settlement and sedimentation dams will be backfilled after all carbonaceous material has been removed.

6.2.4 GROWTH MEDIUM DEVELOPMENT

In the context of this RMP, growth media development encompasses activities to reinstate soils with the initial physical, chemical and biological characteristics required to establish the desired vegetation community.

f. Characterisation

Soils stockpiled and to be used for rehabilitation have undergone preliminary sampling and classification:

- Metals analysed (Boron, copper, Iron, Manganese and Zinc) were low and below contamination guidelines,
- Levels of iron were high ranging between 24,000 and 35,000 mg/kg,
- pH is between 6.5 to 8.1,
- Electrical conductivity, exchangeable calcium and exchangeable sodium are slightly evaluated in a few samples,
- Nutrient levels are good with around 1000mg/kg of total nitrogen, and total phosphorus around 350mg/kg,

	WHITEHAVEN GOC	Document Owner:	Env Advisor
		Document Approver:	Env Superintendent
		Revision Period:	3 years
		Issue:	1
		Last Revision Date:	December 2023
WHC-PLN-OC-CHPP-REHABILITATION MANAGEMENT PLAN			

- There is very low organic between 1% and 5%.

Based on these results, soil applied during rehabilitation may require addition of gypsum and organic matter in the form of cattle manure.

g. Topsoil Respreding and Amelioration

After removal of all carbonaceous material and final landform achieved, topsoil will be spread across disturbed areas, these include;

- ROM Pad
- Beneficiation infrastructure areas
- Tailing's facilities and associated water structures

Soil placement process will include;

- Topsoil will be spread to a nominal depth of 150 millimetres (mm);
- All soils will be lightly ripped prior to seeding. This will be conducted on the contour and will be managed to minimise the potential for unsuitable spoil material being ripped up to the surface;
- Fertiliser application will be considered prior to seeding (agricultural rehabilitation only) while the surface is being lightly scarified to create an optimal seed bed.

h. Seed Bed Preparation

Thorough seedbed preparation will be undertaken to ensure optimum establishment and growth of vegetation. All top-dressed areas are to be ripped (after top-dressing) to create a "key" between the soil and the subsoil / capping.

For seedings areas ripping will be undertaken along the contour, where possible and immediately prior to sowing. The spread top-dressed surface is then scarified to incorporate any ameliorant applied and scarified after spreading seed to ensure soil contact with seed.

6.2.5 ECOSYSTEM AND LAND USE ESTABLISHMENT

In the context of this RMP, ecosystem and land use establishment included activities to establish the desired floristic composition (species diversity and density) and habitat features.

The phase incorporated management actions such as weed and feral pest control to achieve species establishment and growth to juvenile communities, and habitat augmentation.

Revegetation activities were planned to occur after the completion of reshaping, topdressing with growth media and construction of drainage structures.

i. Domain B – Agricultural – Grazing

Following the re-creation of the final landform a pasture mix will be sown by conventional agricultural methods i.e., preparation of surface to form seed bed, broadcast seeding and scarification. This sequence was implemented to stabilise the landform and return the land to agricultural productivity. The pasture species applied were appropriate for the season and generally included annual and perennial grass species and legumes as identified in Table 18.

	WHITEHAVEN GOC	Document Owner:	Env Advisor
		Document Approver:	Env Superintendent
		Revision Period:	3 years
		Issue:	1
		Last Revision Date:	December 2023
WHC-PLN-OC-CHPP-REHABILITATION MANAGEMENT PLAN			

Table 18 Recommended Pasture Species Seed Mix

Pasture Species	Rate (kg/ha)	Ameliorant
Warm Season Grasses		
Bombatsi Panic	1 – 2	Gypsum Composted Manure
Green Panic 1	2 – 4	
Purple Pigeon Grass	1 – 2	
Annual Legumes		
Subterranean Legume	4 - 5	-
Cool Season Legumes		
Barrel (Sephi) medic	2 – 4	-
Snail (sava) medic	3 – 5	-
Woolly Pod Vetch	4 – 6	-
Serradella (Elgara)	1 – 2	-
Lucerne	0.5	-
Cool Season Grasses		
Phalaris (Sirolan or Holdfast)	1 - 2	-
Wallaby Grass	0.3 - 1	-

j. Weed and Vertebrate Pest Control

Ecosystem Establishment includes initial management actions to limit the introduction of weeds and vertebrate pest species in rehabilitation areas. Ongoing weed and pest management and monitoring is considered in the ecosystem and land use development phase (refer **Section 6.4.6**).

Management measures include:

- Treatment of weeds on topsoil stockpiles prior to re-spreading in rehabilitation areas;
- Ensuring all plant and equipment are weed free prior to mobilisation to rehabilitation areas;
- Maximising the retention of ground cover (cover crop stubble) when planting tubestock to minimise opportunities for weed activity; and
- Installation of fauna exclusion fencing and/or tree guards for newly planted tubestock where predation by grazing herbivores represents a risk to establishment.
- If required, an agronomist will be engaged to provide recommendations for priority weeds

6.2.6 ECOSYSTEM AND LAND USE DEVELOPMENT

For the purposes of this RMP the Ecosystem and Land Use Development phase represents those activities required to develop sustainable ecosystems that have characteristics comparable to similar undisturbed vegetation associations (analogue site) in the area.

k. All Domains

Activities associated with the ecosystem and land use development phase of rehabilitation are generally ongoing maintenance and land management activities and rehabilitation monitoring. Maintenance at rehabilitated areas will include, but not be limited to:

- ongoing environmental management to minimise risks to rehabilitation;
- ongoing visual observations of weeds and feral animal activity including inspections for all the nominated vertebrate pests

	WHITEHAVEN GOC	Document Owner:	Env Advisor
		Document Approver:	Env Superintendent
		Revision Period:	3 years
		Issue:	1
		Last Revision Date:	December 2023
WHC-PLN-OC-CHPP-REHABILITATION MANAGEMENT PLAN			

- comparing specific ecosystem characteristics such as soil profile development, floristic composition and structure and faunal diversity and abundance with the characteristics of appropriate analogue sites; and
- undertaking adaptive management and remedial works where characteristics of the rehabilitation are not trending toward desired outcomes.


Rehabilitation monitoring will be undertaken throughout the ecosystem and land use development phase until it can be demonstrated that rehabilitation areas have met all conditions for relinquishment. Rehabilitation maintenance activities will be identified by rehabilitation monitoring and ongoing requirements will be reported annually in the Annual Rehabilitation Report and Forward Program.

6.2.7 REHABILITATION COMPLETION (SIGN-OFF)

On achievement of rehabilitation criteria outlined in **Section 4**, sign -off will be sought from the DPE.

6.3 REHABILITATION OF AREAS AFFECTED BY SUBSIDENCE

There has been no mining or underground mining on the project area or risk of subsidence.

	WHITEHAVEN GOC	Document Owner:	Env Advisor
		Document Approver:	Env Superintendent
		Revision Period:	3 years
		Issue:	1
		Last Revision Date:	December 2023
WHC-PLN-OC-CHPP-REHABILITATION MANAGEMENT PLAN			

7 **REHABILITATION QUALITY ASSURANCE PROCESS**

A Rehabilitation Quality Assurance Process (RQAP) is been developed, in line with what is currently used at other Whitehaven Coal mining areas that comprise the Gunnedah Open Cut Operations. This will include details of inspections, monitoring and record keeping which will be required to ensure that:

- Rehabilitation was implemented in accordance with the nominated methodologies; and
- Identified risks to rehabilitation are being adequately addressed and closed out for relinquishment.

Whitehaven will implement the RQAP through the detailed closure process to confirm that the rehabilitation strategies outlined in this RMP have been completed in accordance with the nominated methodologies (see **Section 6.2**). The RQAP will also include inspections and documentation to verify that each phase of demolition and rehabilitation has been completed and has met the completion criteria detailed in **Section 4**. Documentation to be maintained would include (but not limited to):

Phase 1 – Active Operations

- Maintain an asset register
- Annual survey of tailing quantities
- Topsoil stockpile management
- Detailed plans and designs of infrastructure and water management structures

Phase 2 – Decommissioning

- Inspection and demolition reports to confirm all infrastructure to be demolished has been removed; and
- Validation testing to ensure any contamination has been appropriately remediated and/or removed.

Phase 3 – Landform Establishment


- Survey and preparation of as constructed drawings of final constructed slopes, landforms and water drainage structures; and
- Verification reporting to confirm the specified depth of capping has been implemented (i.e., aerial surveys).

Phase 4 – Growth Medium Development

- Maintenance of a topsoil inventory to document stripped, stockpiled and re-spread resources;
- Site records of re-spread topsoil, ameliorants, fertiliser etc.; and
- Soil testing results to confirm appropriate soil geochemical parameters for plant establishment.

Phase 5 – Ecosystem and Land Use Establishment

- Documentation of reseeded or planting activities undertaken, such as date of planting, seeding rates and/or planting rates; and
- Site inspections and monitoring of rehabilitated areas to allow early identification of any emerging threats to rehabilitation.
- Inspections of temporary and permanent erosion and sediment controls;

	WHITEHAVEN GOC	Document Owner:	Env Advisor
		Document Approver:	Env Superintendent
		Revision Period:	3 years
		Issue:	1
		Last Revision Date:	December 2023
WHC-PLN-OC-CHPP-REHABILITATION MANAGEMENT PLAN			

- Inspections to identify potential weed infestations;
- Documentation of Rehabilitation Monitoring

Phase 6 – Ecosystem and Land Use Development

- Inspections of temporary and permanent erosion and sediment controls;
- Inspections to identify potential weed infestations;
- Documentation of Rehabilitation Monitoring; and
- Documentation of weed and feral animal management and eradication programs and follow-up inspections.

Whitehaven have developed a Rehabilitation Quality Checklist to be signed off after each phase of rehabilitation prior to proceeding to the next phase (refer **Figure 8**).



WHITEHAVEN GOC

Document Owner:	Env Advisor
Document Approver:	Env Superintendent
Revision Period:	3 years
Issue:	1
Last Revision Date:	December 2023

WHC-PLN-OC-CHPP-REHABILITATION MANAGEMENT PLAN

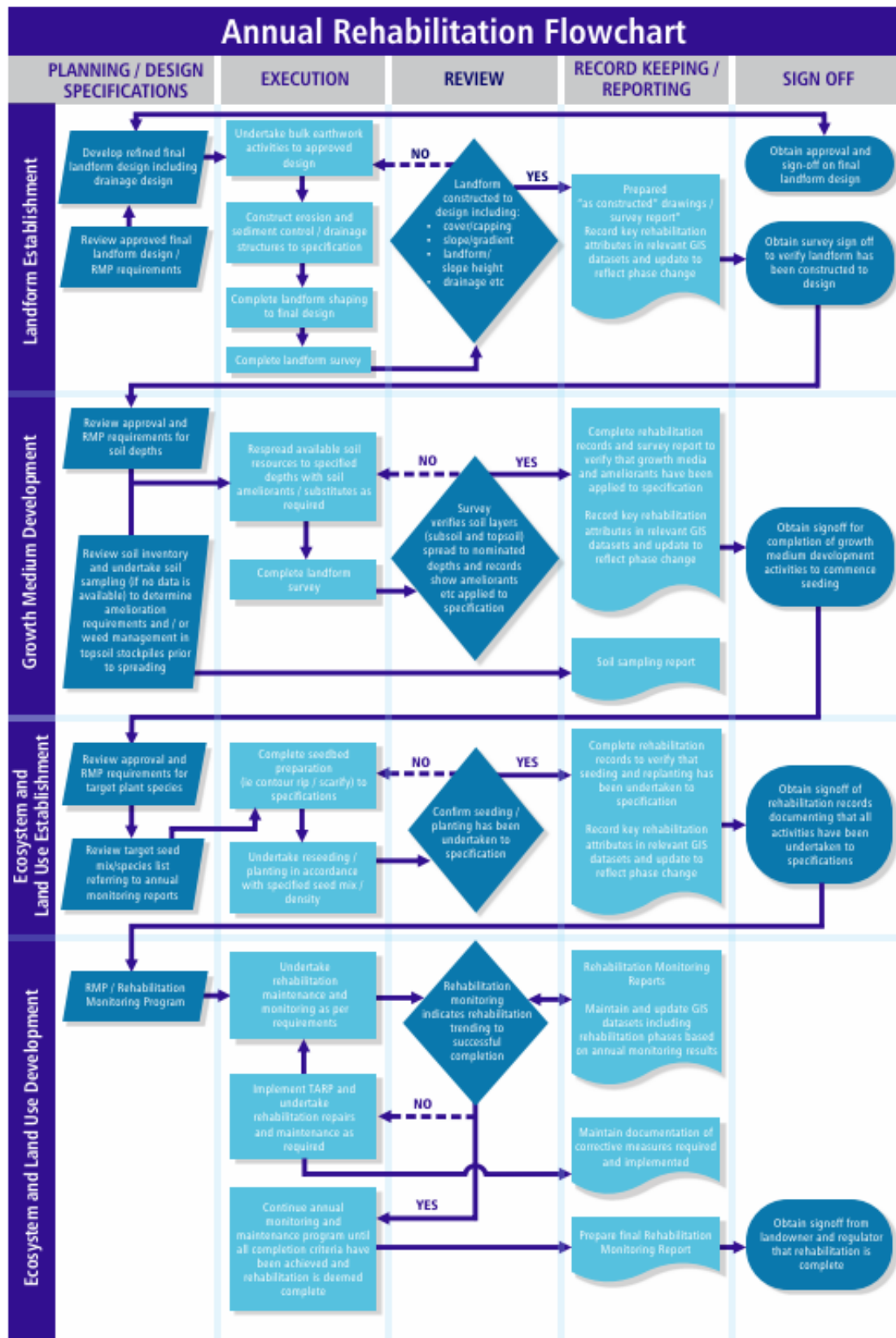


Figure 8 - Rehabilitation Quality Assurance Process

	WHITEHAVEN GOC	Document Owner:	Env Advisor
		Document Approver:	Env Superintendent
		Revision Period:	3 years
		Issue:	1
		Last Revision Date:	December 2023
WHC-PLN-OC-CHPP-REHABILITATION MANAGEMENT PLAN			

8 **REHABILITATION MONITORING PROGRAM**

Rehabilitation monitoring is undertaken to measure and assess rehabilitation performance against the stated rehabilitation and closure criteria outlined in this document. The monitoring results are also used to identify the need for corrective actions for rehabilitation performance. The monitoring program incorporates the most appropriate indicators and methods that:

- Provide a measure of completion criteria to be assessed in accordance with the defined rehabilitation objectives;
- Adequately track changes to rehabilitation phases;
- Are reproducible;
- Utilise scientific recognised techniques; and
- Are cost-effective.

Monitoring is conducted by a suitably skilled and qualified person(s) at locations representative of the range of conditions on the rehabilitating areas and appropriate analogue sites. Monitoring results will inform refinements of rehabilitation methodology as required. Rehabilitation monitoring will be continued until it can be demonstrated that rehabilitation has satisfied all rehabilitation and closure criteria. Monitoring and aftercare program will continue on land parcels that are part of the project approval area but not owned by Whitehaven Coal in consultation as to timing with the landowner until closure criteria has been met.

8.1 **ANALOGUE SITE BASELINE MONITORING**

Analogue sites in 'best-on-offer' vegetation are used to determine if the appropriate characteristics are developing or being achieved. For benchmarking purposes, there are replicate sites within each vegetation community target, and repeat monitoring to capture seasonal variation. Protocols have been established to ensure that sites are appropriately located and position, as detailed in the Whitehaven Standard Annual Rehabilitation Monitoring Methodology (WHC-STD-OC-Rehabilitation Monitoring Method).

8.2 **REHABILITATION ESTABLISHMENT MONITORING**


Annual Rehabilitation monitoring is undertaken each year as sites are established in rehabilitation that has been seeded since the previous monitoring event. Annual Rehabilitation Monitoring of the newly established sites will identify issues and success within developing rehab.

Annual Rehabilitation monitoring results will link with the TARP management system in **Section 10** if issues are identified during the monitoring period.

The data yielded from the monitoring program allows an adaptive management approach by providing information to inform the type and implementation of management activities and determining the status of rehabilitation performance in relation to completion criteria. This facilitates the continual improvement and refinement of rehabilitation techniques.

8.3 **MEASURING PERFORMANCE AGAINST REHABILITATION OBJECTIVES AND REHABILITATION COMPLETION CRITERIA**

- Annual Rehabilitation Walk Over Inspections

	WHITEHAVEN GOC	Document Owner:	Env Advisor
		Document Approver:	Env Superintendent
		Revision Period:	3 years
		Issue:	1
		Last Revision Date:	December 2023
WHC-PLN-OC-CHPP-REHABILITATION MANAGEMENT PLAN			

- Annual walk-through of all rehabilitated areas is undertaken internally by a suitably qualified person(s) in Spring to assess the general progress of completed rehabilitation and to identify areas where corrective action is necessary. This assessment has simple objectives relating to vegetation establishment, weeds, erosion presence, surface water management and erosion and sediment control structures.
- Any issue identified during the walk over will be recorded and the Annual Site Rehabilitation Plan which is updated to include remediation or monitoring activities on the issues.

8.4 ANNUAL REHABILITATION MONITORING

- Annual Rehabilitation Monitoring is undertaken during spring each year when species are generally flowering, and more species diversity can be identified. Monitoring is undertaken in accordance with the Whitehaven Standard Annual Rehabilitation Monitoring Methodology (WHC-STD-OC-Rehabilitation Monitoring Method).
- The monitoring provides detailed (transect-based) scientific data and trends on vegetation community establishment and development and is based on the Biodiversity Assessment Methodology (BAM).
- Additional monitoring sites are established as rehabilitation progress. Periodic or standalone monitoring projects are commissioned as required, and may include targeted fauna, soil, and trial studies.
- Detailed analysis of the monitoring data generated by the annual rehabilitation monitoring program is undertaken to determine the trajectory rehabilitation is tracking towards to achieve the final land uses detailed above. The analysis and monitoring outcomes are documented in annual monitoring reports.
- Regular visual inspections of all phases of rehabilitation are also undertaken by WHC personnel. These informal assessments facilitate early management intervention, and include:
 - Success of initial germination after seeding;
 - Success of tree and shrub plantings;
 - Adequacy of drainage controls;
 - Presence/absence of weeds; and
 - General stability of the rehabilitation site.
- Any issue identified during rehabilitation inspection and documented in the annual rehabilitation monitoring report is actioned in the Annual Site Rehabilitation Plan.

8.5 REHABILITATION PERFORMANCE

Outcomes of monitoring results as described in **Section 8.3.1 to 8.3.2** are incorporated within the *Annual Site Rehabilitation Plan* which is developed every year by the end of June to align with the budget period. The *Annual Site Rehabilitation Plan* provides additional specific detail, maps and data on planned rehabilitation/closure activities and schedules for the next 12-month period. Notwithstanding this, planned activities are consistent with those in the Forward Program/LOM Plans. The *Annual Site Rehabilitation Plan* will provision for rehabilitation activities depending on the phase of rehabilitation at a particular area. The *Annual Site Rehabilitation Plan* will be the key document for tracking the progress of rehabilitation through rehabilitation phases.

	WHITEHAVEN GOC	Document Owner:	Env Advisor
		Document Approver:	Env Superintendent
		Revision Period:	3 years
		Issue:	1
		Last Revision Date:	December 2023
WHC-PLN-OC-CHPP-REHABILITATION MANAGEMENT PLAN			

9 REHABILITATION RESEARCH, MODELLING AND TRIALS

There is currently no rehabilitation trial planned for the Gunnedah CHPP operations.

Across Gunnedah opencut mines and operations there are a number of rehabilitations trials currently been undertaken. These include a seed coating trial at Sunnyside mine, seed germination trial on topsoil stockpile at Rocglen mine, and a research project focusing on best methods to get native grasses established in areas where sub-tropical grasses tend to dominate.

10 INTERVENTION AND ADAPTIVE MANAGEMENT

Where rehabilitation performance is not trending toward the nominated completion criteria this may indicate that there is a potential threat to long term rehabilitation success. Threats to rehabilitation may include events such as extended periods of drought, bushfire events, or pressures from weeds and feral/pest animals.

A Rehabilitation and Closure TARP has been developed to provide a framework to manage potential key risks to rehabilitation during the mine closure and has been developed based on rehabilitation and closure risks. The Rehabilitation and Closure TARP includes:

- Identification of the principal contributing factors and impacts for each major risk to rehabilitation;
- Identification of upper limits (trigger values) for causes and impacts that are considered to represent an unacceptable level of risk; and
- Identification of appropriate responses to mitigate or remediate the causes and impacts, including a notification protocol.

The Rehabilitation and Closure TARP provides management responses for lower (first tier) and upper (second tier) trigger values. First tier trigger values identify opportunities for closer monitoring or early intervention that may mitigate potential impacts before notable impact to rehabilitation occurs. Second 60 tier trigger values identify when indicators have reached a threshold that requires more substantive or widespread remedial actions to remediate or mitigate rehabilitation failure.

Should any trigger conditions be met resulting in the requirement for intervention or adaptive management, actions will be reported in the Annual Review. Whitehaven will notify the Resource Regulator and other relevant stakeholders of any incident (such as bushfire or disease) that results in major impacts to rehabilitation that are likely to significantly impact the potential to achieve rehabilitation success.

The Rehabilitation and Closure TARP is provided in **Table 19 and Table 19B** and will be revised as conditions change or new risks to rehabilitation are identified.



WHITEHAVEN GOC

Document Owner:	Env Supt
Document Approver:	Env & Rehab Mgr
Revision Period:	3 years
Issue:	1
Last Revision Date:	December 2023

WHC-PLN-OC-CHPP-REHABILITATION MANAGEMENT PLAN

Table 19 Trigger Action Response Plan

Aspect/ Category	Key Element	Element Number	Trigger Response	1st Level Trigger	2nd Level Trigger
Landform stability	Slope gradient	1	Trigger	Monthly survey data indicates that the landform is not built to the final landform design.	<55% of the rehabilitation area has slopes within the limits stipulated in the final the RMP.
			Response	Check machinery guidance system on dozers and update if required Check site datum and update if required. Undertake regrading as required	Undertake a review of the landform design and make an assessment of the stability of the landform including material characterisation. Undertake stability enhancement works including revegetation if required. Consider regrading to achieve stability.
	Erosion control	2	Trigger	Minor gully or tunnel erosion present and/or minor rilling (rilling up to 200 mm in depth or width).	Slumping and / or active gully or tunnel erosion present and / or rilling >200mm, which is compromising landform stability.
			Response	An inspection of the site will be undertaken by a suitably experienced person. Investigate opportunities to install water management infrastructure to address erosion. Remediate as appropriate.	Engage suitably qualified person(s) to assist with the management of erosion and sedimentation at the site and provide recommendations to appropriately remediate the erosion. Remediate as soon as practicable.
	Water management Structures	3	Trigger	Water management structures (sediment dams, channels, contour banks) minor erosion and/or scouring as determined by monitoring.	Water management structures fail or display significant scouring / erosion as determined by monitoring.
			Response	An inspection of the site will be undertaken by a suitably trained person. Identify remedial actions such as amelioration, re-vegetation or alternative scour protection	Engage a suitably qualified person to develop a site-specific remediation plan and review water management structure design criteria. Provide for physical works on the basis of design review.
Soil/spoil Quality	Salinity	4	Trigger	Increasing trend in soil/water salinity levels	Presence of salt scalds
			Response	Undertake soil/spoil testing to verify EC and recommend further soil / spoil amelioration	Engage a specialist consultant suitably qualified person to develop a site-specific management report to be implemented to remediate salinity scalds. Undertake works as required.



WHITEHAVEN GOC

Document Owner:	Env Supt
Document Approver:	Env & Rehab Mgr
Revision Period:	3 years
Issue:	1
Last Revision Date:	December 2023

WHC-PLN-OC-CHPP-REHABILITATION MANAGEMENT PLAN

	Spoil surface layers chemical characteristics	5	Trigger	Increasing trend in soil dispersivity (EAT)	Soils are moderately to highly dispersive
			Response	Undertake testing to determine required amelioration and undertake amelioration as required.	Review material handling practices to confirm that non-dispersive spoil is selectively dumped at final RL where possible and /or dispersive spoils emplaced at surface are appropriately ameliorated. Ameliorate dispersive spoils (for example with coarse gypsum) to a depth of 300 mm. Re-vegetate if required.
	Soil biophysical and chemical characteristics	6	Trigger	Soil biophysical and chemical characteristics not able to sustain vegetation growth for required vegetation community	Soil physical, chemical and biological characteristics continues to illustrate signs of not able to sustain the desired final land use.
			Response	Engage a consultant to recommend appropriate soil/spoil amelioration. Undertake amelioration and re-vegetation in accordance with the consultant recommendations.	Engage a consultant to recommend appropriate soil/spoil amelioration. Undertake amelioration and re-vegetation in accordance with the consultant recommendations.
	Topsoil depth	7	Trigger	Topsoil is not reinstated to, at least, the minimum depth specified for the proposed final land use. As identified in the quality assurance process	Sufficient suitable topsoil cannot be identified for reinstatement at the minimum specified depth for the proposed final land use i.e., 150 mm to 200 mm (agriculture areas), 200 mm (other disturbance areas).
			Response	Spread additional topsoil to achieve required depth	Engage a consultant to recommend appropriate soil/spoil amelioration. Undertake amelioration and re-vegetation in accordance with the consultant recommendations.
Biodiversity (native vegetation areas)	Native Species Richness	8	Trigger	Less than 50% of species sown recorded.	Less than 25% of species sown recorded.
			Response	Undertake a field survey to identify which species do not present in revegetation areas. Re-seed or maintenance planting of revegetation areas with unsatisfactory species richness. Review viability results and modify seed species as required.	Undertake a field survey to identify which species do not present in revegetation areas. Engage an independent specialist to review seed viability and others causes for revegetation failure and recommend remedial actions.



WHITEHAVEN GOC

Document Owner:	Env Supt
Document Approver:	Env & Rehab Mgr
Revision Period:	3 years
Issue:	1
Last Revision Date:	December 2023

WHC-PLN-OC-CHPP-REHABILITATION MANAGEMENT PLAN

				Use annual rehabilitation monitoring data to track progress	Implement appropriate management actions including revising rehabilitation procedures if required.
	Native Groundcover	9	Trigger	Less than 50% of groundcover species sown recorded.	Less than 25% of groundcover species sown recorded.
			Response	Undertake a field survey to identify likely causes of unsatisfactory germination rates. Re-seed areas with unsatisfactory cover. Review seeding procedures incl. seasonal mixes, timing and seed rate per hectare.	Undertake a field survey to identify which species do not present in revegetation areas. Engage an independent specialist to review seed viability and others causes for revegetation failure and recommend remedial actions. Implement appropriate management actions including revising rehabilitation procedures if required.
	Exotic Plant Cover (Weeds)	10	Trigger	Increasing number and cover of exotic species and/or occurrence of newly identified exotic species.	More than 10% of domain area and/or significant weed invasions.
			Response	Engage weed management contractor to remove / spray introduced weed species.	Engage weed management contractor to remove introduced weed species. Investigate management measures to improve native plant establishment and weed suppression. Implement recommendations as appropriate.
	Water Quality	11	Trigger	Water quality exceeds baseline values	Long term trend the Water Quality Guidelines (2018) limits values
			Response	Review and investigation of water quality monitoring and management where appropriate. Implement relevant remedial measures where required.	Specialist to review sampling and climate data and review likely cause(s). If mine related, undertake assessment to identify sources of water quality degradation and recommend remedial actions Implement specialist recommendations
		12	Trigger	Sediment basin discharge exceeds EPL criteria for pH, TSS and/or oil/grease	Long term trend outside the Water Quality Guidelines (2018) limits
			Response	Re-sampling will be undertaken during the next discharge event to confirm results exceed limits and investigate potential causes.	Review sediment basin maintenance and discharge procedures, and sediment basin capacity requirements. Undertake required corrective actions.



WHITEHAVEN GOC

Document Owner:	Env Supt
Document Approver:	Env & Rehab Mgr
Revision Period:	3 years
Issue:	1
Last Revision Date:	December 2023

WHC-PLN-OC-CHPP-REHABILITATION MANAGEMENT PLAN

			Response	Undertake a review of the landform design to assess risks to stability and free draining design.	Engage a specialist to assist with the management of settlement and slumping and provide recommendations to appropriately remediate. Consider rehandling material and/or regrading if required.
	Monitoring of final landform	14	Trigger	Survey or remote sensing of the rehabilitated landforms indicates settlement or slumping that could compromise stability.	Survey or remote sensing of the rehabilitated landforms indicates major settlement or slumping.
			Response	Undertake a review of the landform design to assess risks to stability and free draining design.	Engage a specialist to assist with the management of settlement and slumping and provide recommendations to appropriately remediate. Consider rehandling material and/or regrading if required.

Table 19B Triggers and Actions for rehabilitation completion criteria.

Final Land Use Domain	Mining Domain	Rehabilitation Objective (describe the desired feature and/or characteristics of the final land use domain)	Rehabilitation Completion Criteria (benchmark for the indicator, based on analogue data where appropriate)	Trigger on Criteria not achieved	Response
Agricultural – Grazing (Rehabilitation Area – Pasture)	Infrastructure	All surface infrastructure has been decommissioned and removed, unless approved otherwise by the Secretary	All utility infrastructure removed.	Post decommissioning audit or site staff finds remaining infrastructure	Asset register will be reviewed and infrastructure removed using demolition services as required.
			Infrastructure removed.	Post decommissioning audit or site staff finds remaining infrastructure	Asset register will be reviewed and infrastructure removed using demolition services as required.
			All concrete footings, foundations and pavements have been removed to avoid exposure pathways to subsequent final land use.	Post decommissioning audit or site staff finds remaining infrastructure0	Asset register will be reviewed and infrastructure removed using demolition services as required.
Infrastructure	Infrastructure	Retention of infrastructure (if applicable): All infrastructure that is to remain as part of the final land use is safe and does not pose any hazard to the community and is approved by the Secretary for retention.	Hazards isolated and secured, infrastructure meets building codes etc..	Statement provided by suitably qualified engineer indicates deficiencies in infrastructure.	Repairs will be carried out and signed off by engineer
			Access tracks in good condition.	Erosion or damage to access tracks is noted during monthly inspection or review of UAV aerial data.	Investigate the cause of damage, ensure damage does not reoccur and remediate.
			Approval in place	Approval from the Secretary not received	Infrastructure will be decommissioned and removed.



WHITEHAVEN GOC

Document Owner:	Env Supt
Document Approver:	Env & Rehab Mgr
Revision Period:	3 years
Issue:	1
Last Revision Date:	December 2023

WHC-PLN-OC-CHPP-REHABILITATION MANAGEMENT PLAN

Final Land Use Domain	Mining Domain	Rehabilitation Objective (describe the desired feature and/or characteristics of the final land use domain)	Rehabilitation Completion Criteria (benchmark for the indicator, based on analogue data where appropriate)	Trigger on Criteria not achieved	Response
Agricultural – Grazing (Rehabilitation Area – Pasture) And Industrial	Infrastructure	All hazardous and contaminated materials are appropriately removed or remediated in accordance with the recommendations of a contamination site assessment.	There are no visible signs of contamination following the removal of plant, equipment, and materials. All rubbish/ waste materials have been removed from site.	Waste or redundant equipment found to be on site post rehab	Site audit will be undertaken to determine extent of any waste or redundant equipment. Program of removal will be put in place.
			Contamination has been appropriately remediated, removed or managed so that appropriate guidelines for land use are met, e.g., Health Investigation Level (HIL) or Ecological Investigation Level (EIL) of the NEPM (1999).	Site Contamination Audit Report indicates remaining contamination	Additional contamination testing will be undertaken to determine extent and appropriate remediation undertaken. Follow up site contamination study and audit report will be commissioned.
			Any carbonaceous material has been removed from the footprint of the infrastructure areas transported off site to approved location.	Carbonaceous material found on site post rehabilitation by final site inspection or contamination audit inspection.	Depth and extent of carbonaceous material will be investigated and removed off site and area rehabilitated.
Water management	Water management	All water management infrastructure has been decommissioned and removed, unless approved otherwise by the Secretary	Infrastructure removed.	Post decommissioning audit or site staff finds remaining infrastructure	Asset register will be reviewed and infrastructure removed using demolition services as required.
Water management Agricultural – Grazing (Rehabilitation Area – Pasture)	Water management	Domain stable, limited groundwater seepage and non-polluting	Sediment accumulated in mine water and sediment dams is removed and taken off site if containing carbonaceous material, supported by records.	Site Contamination Audit Report indicates remaining contamination	Additional contamination testing will be undertaken to determine extent and appropriate remediation undertaken. Follow up Site Contamination study and audit report will be commissioned.
All domains	All domains	All surface infrastructure, plant and equipment has been decommissioned and removed, unless approved otherwise by the Secretary	Infrastructure and equipment (including mobile equipment) removed	Post decommissioning audit or site staff finds remaining infrastructure	Asset register will be reviewed and infrastructure removed using demolition services as required.
All domains	All domains	Stable and permanent landform established	Survey verifies final landform are free draining integrated into surrounding landscape.	Erosion or rilling noticed in post rehabilitation monthly inspection.	Cause of rilling/erosion will be investigated, and remediation undertaken.
			Survey or remote sensing of the rehabilitated landforms shows an absence of slumping that could compromise stability.	Slumping noticed in post rehabilitation monthly inspection.	Cause of slumping will be investigated, and remediation undertaken.



WHITEHAVEN GOC

Document Owner:	Env Supt
Document Approver:	Env & Rehab Mgr
Revision Period:	3 years
Issue:	1
Last Revision Date:	December 2023

WHC-PLN-OC-CHPP-REHABILITATION MANAGEMENT PLAN

Final Land Use Domain	Mining Domain	Rehabilitation Objective (describe the desired feature and/or characteristics of the final land use domain)	Rehabilitation Completion Criteria (benchmark for the indicator, based on analogue data where appropriate)	Trigger on Criteria not achieved	Response
		Final Landform non-polluting	Water quality measured at discharge points and downstream monitoring locations meets guidelines, no impact between received run-on and water leaving site.	Quarterly surface water sampling indicates potential degradation of water quality leaving site	Cause of deterioration water quality will be investigated, and remediation undertaken.
		Final landform blends with the surrounding topography	Visual assessments and as constructed survey verifies the regraded landform blends with the surrounding topography	As constructed survey indicates landform not in line with design.	Survey results and design will be reviewed and landform amended to be in line with final landform design.
Water Management Area	Water Management Area	Domain stable and non-polluting	No pooling of water over site following rainfall	Visual monthly inspection or aerial imaging indicates low areas where water is ponding.	Depressed areas will be filled with a suitable growth medium and made free draining.
			Monitoring indicated that surface water complies with the Water Quality Guidelines (2018) trigger value for livestock (cattle) or analogue monitoring site	Quarterly surface water sampling indicates potential degradation of water quality leaving site	Cause of deterioration water quality will be investigated, and remediation undertaken.
		Water Approvals Structures that take or divert water such as final voids (there is no final void), dams, levees etc. are appropriately licensed (e.g., under the Water Management Act 2000) and where required ensure sufficient licence shares are held in the water source(s) to account for water take.	Site water capture of runoff water is less than 10% of total runoff	Only the Fresh Water Dam will remain post closure and will be on Gunnedah Shire Council owned parcel of land. After final rehabilitation a review of site harvestable right will be undertaken to confirm compliance.	Water structures impacting harvestable rights will be removed and remediated.
Agricultural – Grazing (Rehabilitation Area – Pasture)	All domains	Growth media is appropriate to support the final land use	Rehabilitation records verify that rehabilitation areas topsoiled with a nominal depth of 150 mm, where available.	Test pitting and as constructed surveys indicate soil depth is less than 150mm.	Additional growth medium will be placed and resurveyed to assure compliance.
			Monitoring verifies soil characteristics such as pH, Electrical Conductivity, Exchangeable sodium percentage, nitrogen and phosphorous are in the range of analogue sites or do not appear to be limiting plant performance.	Soil sampling as part of annual monitoring indicates soil characteristics are deteriorating.	Cause of worsening quality will be investigated and additional ameliorants applied to rectify the situation. Use of soil specialist may be required.
			Soil ameliorants (e.g., gypsum, mulch, biosolids, composts) are applied where necessary (supported by records).	Audit of records indicate planned ameliorants were not applied.	Ameliorants will be applied as required.
		The rehabilitated area does not represent an erosion hazard	Monitoring of water discharged from the Mine complies with guideline levels No identifiable erosion or sedimentation	Quarterly surface water sampling indicates potential degradation of water quality leaving site	Cause of deterioration water quality will be investigated, and remediation undertaken.



WHITEHAVEN GOC

Document Owner:	Env Supt
Document Approver:	Env & Rehab Mgr
Revision Period:	3 years
Issue:	1
Last Revision Date:	December 2023

WHC-PLN-OC-CHPP-REHABILITATION MANAGEMENT PLAN

Final Land Use Domain	Mining Domain	Rehabilitation Objective (describe the desired feature and/or characteristics of the final land use domain)	Rehabilitation Completion Criteria (benchmark for the indicator, based on analogue data where appropriate)	Trigger on Criteria not achieved	Response
Agricultural – Grazing (Rehabilitation Area – Pasture)	All domains	Weeds and feral animals do not present a risk to rehabilitation.	Number of weed species and abundance average no greater than 20% more than that of analogue sites	Quarterly and annual ecological monitoring indicates high weed percentage.	Additional weed treatment will be implemented.
			Monitoring records indicate that feral and pest animal species abundance is no greater than surrounding lands.	Monthly inspection shows signs of feral animals accessing the site.	Pest control contractor will be used to undertake control activities on site.
		Grazing stock is excluded from rehabilitation areas and enrichment zones prior to relinquishment.	Rehabilitation areas and enrichment zones are fenced to exclude grazing stock (until stable and grazing will not impact upon its establishment).	Fences to be installed around the grazing areas after final rehabilitation and when area is ready for grazing	Fencing has been added to rehabilitation plan and will be implemented accordingly.
		Erosion does not present a safety hazard or compromise the post-mining land capability.	Visual monitoring indicates there is no significant erosion that compromises land capability or the intended final land use.	Erosion or rilling noticed in post rehabilitation monthly inspection.	Cause of rilling/erosion will be investigated, and remediation undertaken.
			Monitoring verifies there are no gully or tunnel erosion features, or rills >300 mm deep or wide.	Erosion or rilling noticed in post rehabilitation monthly inspection.	Cause of rilling/erosion will be investigated, and remediation undertaken.
Agricultural – Grazing (Rehabilitation Area – Pasture)	All domains	Bushfire: The risk of bushfire and impacts to the community, environment and infrastructure has been addressed as part of rehabilitation.	Bushfire controls implemented.	Quarterly weed and site inspection will include bushfire controls.	Remediation will be undertaken on inspection reports.
Water Management Area	Water Management Area	Domain stable and non-polluting	No identifiable erosion or sedimentation	Erosion or rilling noticed in post rehabilitation monthly inspection.	Cause of rilling/erosion will be investigated, and remediation undertaken.
			Monitoring of water discharged from the Mine complies with guideline limits	Quarterly surface water sampling indicates potential degradation of water quality leaving site	Cause of deterioration water quality will be investigated, and remediation undertaken.
Agricultural – Grazing (Rehabilitation Area – Pasture)	All domains	Re-establishing agricultural land over the areas disturbed by the mine. Pasture areas will be capable of sustaining grazing with land capability that reflects the pre-mining environment.	Rehabilitated pasture areas have been sown with a mixture of pasture species including fast growing, short-lived species and perennial grasses and legumes.	Pasture areas health will be assessed annually as part of ecological survey. If ecological progression trends are noted to be sub optimal.	Action plan from ecologist will be implemented
			Rehabilitation areas comprise a mixture of grasses representative of regionally occurring vegetation where possible. Grasses sown will be selected from appropriate analogue sites.	Seeds sourced from local supplier are found to contain undesirable non-native species.	Audit of supplier and seed undertaken and correct seeds will be sourced.
			Rehabilitation monitoring records verify that ground cover (vegetation, leaf litter, and mulch) is at least 85%. The first monitoring program will be completed within 12 to 18 months of rehabilitation to quantify pasture crop establishment.	Vegetation health will be assessed annually as part of ecological survey. If ecological progression trends are noted to be sub optimal.	Action plan from ecologist will be implemented



WHITEHAVEN GOC

Document Owner:	Env Supt
Document Approver:	Env & Rehab Mgr
Revision Period:	3 years
Issue:	1
Last Revision Date:	December 2023

WHC-PLN-OC-CHPP-REHABILITATION MANAGEMENT PLAN

Final Land Use Domain	Mining Domain	Rehabilitation Objective (describe the desired feature and/or characteristics of the final land use domain)	Rehabilitation Completion Criteria (benchmark for the indicator, based on analogue data where appropriate)	Trigger on Criteria not achieved	Response
			No bare surfaces >20 m ² in area or >10 m in length down slope as indicated by rehabilitation monitoring at Year 5 following establishment.	Vegetation health will be assessed annually as part of ecological survey. If ecological progression trends are noted to be sub optimal.	Action plan from ecologist will be implemented
			Rehabilitation monitoring shows that pasture health is comparable to analogue sites.	Vegetation health will be assessed annually as part of ecological survey. If ecological progression trends are noted to be sub optimal.	Action plan from ecologist will be implemented
All domains	All domains	Weeds are controlled.	Number of weed species and abundance average no greater than 20% more than that of analogue sites	Quarterly and annual ecological monitoring indicates high weed percentage.	Additional weed treatment will be implemented.
All domains	All domains	Feral animal pests are controlled	Monitoring records indicate that feral and pest animal species abundance is no greater than surrounding lands.	Monthly inspection shows signs of feral animals access the site.	Pest control contractor will be used to undertake control activities on site.
All domains	All domains	Erosion does not present a safety hazard or compromise the post-mining land capability.	There are no gully or tunnel erosion features and there is an absence of rilling (> 300 mm deep) within each domain.	Erosion or rilling noticed in post rehabilitation monthly inspection.	Cause of rilling/erosion will be investigated, and remediation undertaken.
		Monitoring demonstrates soil profile development in rehabilitated areas (e.g., development of organic layer, litter layer).	Soil testing indicates that topsoil soil characteristics (pH, EC [electrical conductivity], ESP) generally meet the following criteria: - pH – between 4.5 and 8.5, or is comparable to relevant analogue sites; - EC - < 1 dS/m, or is comparable to relevant analogue sites; and - ESP – that is comparable to the analogue sites. Where soil testing results indicate values outside the above criteria, rehabilitation monitoring at the relevant area verifies that the soil quality is not inhibiting plant growth.	Soil sampling as part of annual monitoring indicates soil characteristics are deteriorating.	Cause of worsening quality will be investigating and additional ameliorants applied to rectify the situation. Use of soil specialist may be required.
			Rehabilitation monitoring records verify that ground cover (vegetation, leaf litter, and mulch) is greater than 85 %.	Vegetation health will be assessed annually as part of ecological survey. If ecological progression trends are noted to be sub optimal.	Action plan from ecologist will be implemented
Water management areas	Water management areas	Final landform drainage will integrate with surrounding catchments, achieve long-term geomorphic stability and minimise erosion.	Discharge water quality meets EPL requirements.	Quarterly surface water sampling indicates potential degradation of water quality leaving site	Cause of deterioration water quality will be investigated, and remediation undertaken.
			Water management structures are assessed to be stable	Erosion or rilling noticed in post rehabilitation monthly inspection.	Cause of rilling/erosion will be investigated, and remediation undertaken.



WHITEHAVEN GOC

Document Owner: Env Supt

Document Approver: Env & Rehab Mgr

Revision Period: 3 years

Issue: 1

Last Revision Date: December 2023

WHC-PLN-OC-CHPP-REHABILITATION MANAGEMENT PLAN

Final Land Use Domain	Mining Domain	Rehabilitation Objective (describe the desired feature and/or characteristics of the final land use domain)	Rehabilitation Completion Criteria (benchmark for the indicator, based on analogue data where appropriate)	Trigger on Criteria not achieved	Response
Agricultural – Grazing (Rehabilitation Area – Pasture)	All domains	Pasture areas will be capable of sustaining grazing with land capability that reflects the pre-mining environment and to minimise visual impacts	Rehabilitation monitoring verifies that species in pasture rehabilitation areas comprise a mixture of grasses representative of pasture vegetation.	Seeds sourced from local supplier are found to contain undesirable non-native species.	Audit of supplier and seed undertaken and correct seeds will be sourced.
			Established species survive and/or regenerate after disturbance	Vegetation health will be assessed annually as part of ecological survey. If ecological progression trends are noted to be sub optimal.	Action plan from ecologist will be implemented
			Species are capable of setting viable seed, flowering or otherwise reproducing.	Vegetation health will be assessed annually as part of ecological survey. If ecological progression trends are noted to be sub optimal.	Action plan from ecologist will be implemented
			Rehabilitation monitoring verifies that vegetation health is comparable to reference sites.	Vegetation health will be assessed annually as part of ecological survey. If ecological progression trends are noted to be sub optimal.	Action plan from ecologist will be implemented
			Pasture areas are assessed to have a Rural Land Class VI or better (capable of sustaining grazing), consistent with the final landform.	Pasture areas health will be assessed annually as part of ecological survey. If ecological progression trends are noted to be sub optimal.	Action plan from ecologist will be implemented

	WHITEHAVEN GOC	Document Owner:	Env Advisor
		Document Approver:	Env Superintendent
		Revision Period:	3 years
		Issue:	1
		Last Revision Date:	December 2023
WHC-PLN-OC-CHPP-REHABILITATION MANAGEMENT PLAN			

11 **REVIEW, REVISION AND IMPLEMENTATION**

11.1 **REVIEW AND REVISION OF THE PLAN**

The Plan will be reviewed and if required revised in the event of the following:

- An amendment to the rehabilitation objectives, completion criteria or proposed final land use;
- Changes to risks, risk control measures or rehabilitation strategies being identified during the completion of rehabilitation risk assessment or additional investigations;
- When directed to by the DPE Secretary; and
- When triggered by consent conditions (Environmental Audits, Incident Reports, Modifications).

11.2 **IMPLEMENTATION**

The process for ensuring that mining and rehabilitation are conducted in accordance with the RMP is the preparation and implementation of an Annual Rehabilitation Plan. The Annual Rehabilitation Plan is prepared and managed by the site Environmental superintendents and approved by the Mine Manager.

	WHITEHAVEN GOC	Document Owner:	Env Advisor
		Document Approver:	Env Superintendent
		Revision Period:	3 years
		Issue:	1
		Last Revision Date:	December 2023
WHC-PLN-OC-CHPP-REHABILITATION MANAGEMENT PLAN			

ACCOUNTABILITIES

Role	Accountability
General Manager	<p>Ensure adequate resources are available to the Operations Manager to complete required rehabilitation activities according to the forward plan;</p> <p>Ensure adequate resources are available to enable the Environment Manager/Supt to complete the required monitoring and quality control activities in this plan.</p>
Manager	<p>Complete rehabilitation activities according to the schedule put forward in the Forward Plan.</p> <p>Ensure adequate resources are made available to monitor and assure the quality during the rehabilitation process.</p>
Technical Expert	<p>Monitor the progress of the rehabilitation completed against completion criteria and objectives.</p> <p>Monitor and report on any risks to rehabilitation success and communicate those risks effectively.</p> <p>Provide advice to the Operations Manager on all rehabilitation matters.</p>
All Workers	<p>Complete any rehabilitation activities according to procedures and protocols.</p> <p>Advise the Environmental Supt or delegate of any issues or risks encountered during rehabilitation activities.</p>

SUPPORTING DOCUMENTATION

The following supporting documentation which includes associated training materials may need to be consulted and, where appropriate, used when applying this Standard and/or any subordinate procedures:

- *WHC-PRO-GOC-Annual Rehabilitation Planning Process*



WHITEHAVEN GOC

Document Owner:	Env Advisor
Document Approver:	Env Superintendent
Revision Period:	3 years
Issue:	1
Last Revision Date:	December 2023

WHC-PLN-OC-CHPP-REHABILITATION MANAGEMENT PLAN

Revisions	Revision Description	Who Consulted	Date
1	Document Developed	Environmental Manager, Ops Mgr, Env Supt, Env Officer	29/7/23
2			