NSW GOVERNMENT

NSW Resources Regulator

FWP0001507

LUDDENHAM CLAY MINE FORWARD PROGRAM

Monday 14 October 2024 to Wednesday 13 October 2027

Summary

DETAIL	
Mine	Luddenham Clay Mine
Reference	FWP0001507
Forward program commencement date	Monday 14 October 2024
Forward program end date	Wednesday 13 October 2027
Forward program revision (if applicable)	
Contact	Sinead Kelly
Mining leases	ML 1816 (1992)
Project location	Luddenham Operations Pty Limited
Date of submission	Wednesday 4 December 2024

Important

The department may make the information in your program and any supporting information available for inspection by members of the public, including by publication on its website or by displaying the information at any of its offices. If you consider any part of your program to be confidential, please communicate this to the department via the message function on this submission within the NSW Resources Regulator Portal.

Three-year forecast – surface disturbance activities

Project description

The Luddenham Clay/Shale mine is located at 275 Adams Road, Luddenham, NSW (Lot 2 DP 623799) within the Liverpool City Council Municipality. CFT No 13 Pty Ltd, a member of Coombes Property Group (CPG), currently owns the property. Mining operations were originally approved under State Significant Development (SSD) consent DA No. 315-7-2003 issued by the Minister for Infrastructure, Planning and Natural Resources on 23 May 2004. The existing consent has been modified a number of times and the latest modification, MOD 5, was approved May 2021. The mine is currently approved to produce and transport up to 300,000 tonnes per annum (tpa) of clay and shale product up to 31 December 2024, when the consent expires. Rehabilitation will continue beyond the expiry of the extraction activities.

Description of surface disturbance activities

Exploration activities

No exploration is proposed on site for the next three years.

Construction activities

No construction activities are proposed on site for the next three years.

Mining schedule

Mining development method and sequencing and general mine features.

Mining will continue within the currently approved extraction footprint and will be completed by 31 December 2024. No topsoil material remains within the extraction area. Excavators and frontend loaders will load stockpiles directly onto highway haul trucks. Mining will be undertaken using D10 or smaller dozers to rip and push material into stockpiles. Extraction operations will occur in the exposed pit area. The existing batter slopes will be continued down to the floor level of 38 m AHD. For the years 2024-2026 no new disturbance is proposed however rehabilitation will commence in 2025.

Areas identified for emplacements, the sequencing of emplacements, construction, and management.

Overburden, if any, will be emplaced on perimeter bunds or within the void where possible.

Processing infrastructure activities and the location of tailings facilities and schedule for emplacement.

Not applicable.

Waste disposal and materials handling operations.

Raw natural burden materials like sandstone, siderite and laminite will be stored for rehabilitation purposes and back filling when required. Putrescible waste, such as nonrecyclables from the office and workshop will be collected by Council waste pickups. Hydrocarbons from potential fuel spills will be contained and collected using spill kits and will be taken to an appropriately licenced landfill and documented. Any contaminated soils will be assessed and will be treated as directed by appropriately qualified specialists.

Key production milestones

MATERIAL	UNIT	YEAR 1	YEAR 2	YEAR 3
Stripped topsoil (if applicable)	(m^3)	0	0	0
Rock/overburden	(m^3)	8,280	0	0
Ore	(Mt)	0.03	0	0
Reject material[1]	(Mt)	0	0	0
Product	(Mt)	0	0	0

[1] This includes coarse rejects, tailings and any other wastes resulting from beneficiation.

Three-year rehabilitation forecast

Rehabilitation planning schedule

Rehabilitation planning schedule

The site will be mined until 31 December 2024, there will be no rehabilitation undertaken on site prior to January 2024. The proponent consequently will provide a safe, stable, and non-polluting final landform in accordance with the approved Rehabilitation Management Plan. Infilling of the void will be proposed subject to a separate approval and is not assessed as part of this report. The placement of burden within the pit void has continued during the reporting period.

Stakeholder consultation

Consultation has been undertaken with a number of authorities during the EIS process. In addition, comments were provided from relevant authorities on the drafts of the Site Rehabilitation Plan, Biodiversity Management Plan, Soil and Water Management Plan and Final Landuse Management Plans required under the consent. The issues raised were incorporated into the final plans required by conditions of consent and approved by DPIE. No further consultation is planned due to the brief period of mining remaining.

Rehabilitation studies, risk assessments and/or design work

Not applicable.

NSW Resources Regulator

Rehabilitation research and trials

RRT NUMBER	PROJECT/TRIAL NAME	OBJECTIVE OF TRIAL/PROJECT	METHODOLOGY	EXPECTED DATE OF COMPLETION	STATUS
FWP0001507					

Rehabilitation maintenance and corrective actions

No maintenance activities or knowledge gaps have been identified in the ARR for 2023-2024.

Rehabilitation schedule

Rehabilitation will commence after 31/12/2024. It is expected to commence in 2025 as shown in Plan 2A attached. No 'new' areas of rehabilitation are proposed for years 2 and 3 of this FWP. As per the RMP: - Infrastructure such as roads and services not required in final landform unless being utilised for void filling activities subject to separate approval. - Overburden material will be utilised to assist in battering the in-pit slopes. Slopes will be lightly ripped where possible to key in the overburden material. - Topsoil material stored in bunds may be reused on final surfaces. - Seeding/planting of pasture species will be undertaken on finished surfaces. - Rehabilitation progress to be monitored, conduct repairs if required as well as weed and pest management.

Completion of rehabilitation

No areas are expected to be completed for sign-off in the next three years.

Subsidence remediation for underground operations

Not applicable.

Progressive mining and rehabilitation statistics

Three-yearly forecast cumulative disturbance and rehabilitation progression

	FORECAST	UNIT	YEAR 1	YEAR 2	YEAR 3
A	**Total surface disturbance footprint**	(ha)	9.91	9.91	9.91
B	**Total active disturbance**	(ha)	0.29	0.29	0.29
P	**Total new area of land proposed for active rehabilitation**	(ha)	8.72	8.72	8.72

Rehabilitation key performance indicators (KPIs)

	FORECAST	UNIT	YEAR 1	YEAR 2	YEAR 3
O	**Total new active disturbance area**	(ha)			
P	**Total new area of land proposed for active rehabilitation during the reporting period**	(ha)	8.72		
Q	**Annual rehabilitation to disturbance ratio**				

Attachment 1 – Reporting Definitions

REPORTING CATEGORY		DEFINITION
A	Total disturbance footprint – surface disturbance	All areas within a mining lease that either have at some point in time or continue to pose a rehabilitation liability due to surface disturbance activities. The total disturbance footprint is the sum of the total active disturbance, decommissioning, landform establishment, growth medium development, ecosystem and land use establishment, ecosystem and land use development and rehabilitation completion (see definitions below). Underground mining operations should not include the footprint of underground mining areas/subsidence management areas in the total disturbance footprint.
B	Total active disturbance	Includes on-lease exploration areas, stripped areas ahead of mining, infrastructure areas, water management infrastructure, sewage treatment facilities, topsoil stockpile areas, access tracks and haul roads, active mining areas, waste rock emplacements (active/unshaped/in or out-of-pit), tailings dams (active/unshaped/uncapped) and temporary stabilised areas (e.g. areas sown with temporary cover crops for dust mitigation and temporary rehabilitation).
C	Rehabilitation – land preparation	Includes the sum of all disturbed land within a mining lease that have commenced any, or all, of the following phases of rehabilitation – decommissioning, landform establishment and growth medium development. Refer to the glossary of terms in this document for the definition of these phases of rehabilitation.
D	Ecosystem and land use establishment	Includes the area which has been seeded/planted with the target vegetation species for the intended final land use. However, vegetation has not matured to a stage where it can be demonstrated that it will be sustainable for the long term and or require only a maintenance regime consistent with target reference/analogue sites. Typically, rehabilitation areas would be in this phase for at least two years (and usually more) before rehabilitation can be classified as being in the ecosystem and land use development phase. This phase does not apply to infrastructure areas that are being retained as part of final land use for the site.

REPORTING CATEGORY	DEFINITION
O	The area of any new active disturbance that will be created during the next three years, as defined under definition A1 (definition A1 Table 5).
P	The sum of any new rehabilitation to be commenced in the next three years. These areas may be in the phases "Rehabilitation - Land Preparation" or the "Ecosystem & Land Use Establishment" (definitions C & D in Table 5).
Q	The rehabilitation to disturbance ratio (S / R) indicates how many hectares of new rehabilitation are undertaken for each hectare of land disturbed during the three years. A ratio of 1/1 indicates that the area of new rehabilitation and disturbance in that period are the same.

Attachment 2 – Definitions

WORD	DEFINITION
Active	In the context of rehabilitation, land associated with mining domains is considered 'active' for the period following disturbance until the commencement of rehabilitation.
Active mining phase of rehabilitation	In the context of rehabilitation, the active mining phase of rehabilitation constitutes the rehabilitation activities undertaken during mining operations such as salvaging and managing soil resources, salvaging habitat resources, and native seed collection. This phase also includes management actions taken during operations to manage risks to rehabilitation and enhance rehabilitation outcomes such as selective handling of waste rock and management of tailings emplacements.
Analogue site	In the context of rehabilitation, an analogue site is a 'reference site' that represents an example of the defining characteristics (such as vegetation composition and structure or agricultural productivity) of the final land use. Characteristics of analogue sites can be assessed to develop the rehabilitation objectives and completion criteria for final land use domains.
Annual rehabilitation report and forward program	As described in the Mining Regulation 2016.
Annual reporting period	As defined in the Mining Regulation 2016.
Closure	A whole-of-mine-life process, which typically culminates in the relinquishment of the mining lease. It includes decommissioning and rehabilitation to achieve the approved final land use(s).
Decommissioning	The process of removing mining infrastructure and removing contaminants and hazardous materials.
Decommissioning Phase of Rehabilitation	Activities associated with the removal of mining infrastructure and removal and/or remediation of contaminants and hazardous materials. In the context of the rehabilitation management plan this phase of rehabilitation may also include studies and assessments associated with decommissioning and demolition of infrastructure or works carried out to make safe or 'fit for purpose' built infrastructure to be retained for future use(s) following lease relinquishment.

WORD	DEFINITION
Department	The Department of Regional NSW.
Disturbance	See Surface Disturbance.
Disturbance area	An area that has been disturbed and that requires rehabilitation. This may include areas such as on-licence exploration areas, stripped areas ahead of mining, infrastructure areas, water management infrastructure, sewage treatment facilities, topsoil stockpile areas, access tracks and haul roads, active mining areas, waste emplacements (active/unshaped/in or out-of-pit), tailings dams (active/unshaped/uncapped), and areas requiring rehabilitation that are temporarily stabilised (i.e. managed to minimise dust generation and/or erosion).
Domain	An area (or areas) of the land that has been disturbed by mining and has a specific operational use (mining domain) or specific final land use (final land use domain). Land within a domain typically has similar geochemical and/or geophysical characteristics and therefore requires specific rehabilitation activities to achieve the associated final land use.
Ecosystem and Land Use Development	This phase of rehabilitation consists of the activities to manage maturing rehabilitation areas on a trajectory to achieving the approved rehabilitation objectives and completion criteria. 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. This phase of rehabilitation may include specific vegetation management strategies and maintenance such as tree thinning, supplementary plantings and weed management.
Ecosystem and Land Use Establishment	This phase of rehabilitation consists of the processes to establish the approved final land use following construction of the final landform. For vegetated land uses this rehabilitation phase includes establishing the desired vegetation community and implementing land management activities such as weed control. This phase of rehabilitation may also include habitat augmentation such as installation of nest boxes.
Exploration	Has the same meaning as that term under the State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007.

WORD	DEFINITION
Final landform and rehabilitation plan	As defined in the Mining Regulation 2016.
Final land use	As defined in the Mining Regulation 2016.
Form and way	Means the form and way approved by the Secretary. Approved form and way documents are available on the Department's website.
Growth Medium Development	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. 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.
Habitat	Has the same meaning as that term under the *Biodiversity Conservation Act 2016* and the *Fisheries Management Act 1994* (as relevant).
Indicator	An attribute of the biophysical environment (e.g. pH, topsoil depth, biomass) that can be used to approximate the progression of a biophysical process. It can be measured and audited to demonstrate (and track) the progress of an aspect of rehabilitation towards a desired completion criterion (i.e. defined end point). It may be aligned to an established protocol and used to evaluate changes in a system.
Land	As defined in the *Mining Act 1992.*
Landform Establishment	This phase of rehabilitation consists of the processes and activities required to construct the final landform. 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, encapsulate problematic materials such as tailings, and prepare a substrate with the desired physical and chemical characteristics (e.g. rock raking or ameliorating sodic materials).
Large mine	As defined in the Mining Regulation 2016.
Lease holder	The holder of a mining lease.

WORD	DEFINITION
Life of mine	The timeframe of how long a mine is approved to mine, from commencement to closure.
Mine rehabilitation portal	Means the NSW Resources Regulator's online portal that lease holders must use (via a registered account) to: ■ upload rehabilitation geographical information system (GIS) spatial data ■ develop rehabilitation GIS spatial data (using online tracing functions) ■ generate rehabilitation plans and rehabilitation statistics using the map viewer and Rehabilitation Key Performance Indicator functionalities. Data submitted to the mine rehabilitation portal is collated in a centralised geodatabase for use by the NSW Resources Regulator to regulate rehabilitation performance of lease holders.
Mining area	As defined in the *Mining Act 1992*.
Mining domain	A land management unit with a discrete operational function (e.g. overburden emplacement), and therefore similar geophysical characteristics, that will require specific rehabilitation treatments to achieve the final land use(s).
Mining land	As defined in the *Mining Act 1992.*
Native vegetation	Has the same meaning as that term under section 60B of the *Local Land Services Act 2013.*
Overburden	Material overlying coal or a mineral deposit.
Performance indicator	An attribute of the biophysical environment (for example pH, slope, topsoil depth, biomass) that can be used to demonstrate achievement of a rehabilitation objective. It can be measured and audited to demonstrate (and track) the progress of an aspect of rehabilitation towards a desired completion criterion, that is, a defined end point. It may be aligned to an established protocol and used to evaluate changes in a system.

WORD	DEFINITION
Phases of rehabilitation	The stages and sequences of actions required to rehabilitate disturbed land to achieve the final land use. The phases of rehabilitation are: ■ active mining ■ decommissioning ■ landform Establishment ■ growth medium development ■ ecosystem and land use establishment ■ ecosystem and land use development.
Progressive rehabilitation	The progress of rehabilitation towards achieving the approved rehabilitation completion criteria. This may be described in terms of domains, phases, performance indicators and rehabilitation completion criteria.
Rehabilitation Completion	The final phase of rehabilitation when a rehabilitation area has achieved the approved rehabilitation objectives and rehabilitation completion criteria for the final land use. Rehabilitation areas may be classified as complete when the NSW Resources Regulator has determined in writing that the relevant rehabilitation obligations have been fulfilled following submission of *Form ESF2 Rehabilitation completion and/or review of rehabilitation cost estimate* application by the lease holder.
Rehabilitation Completion criteria	As defined in the Mining Regulation 2016.
Rehabilitation cost estimate	As defined in the Mining Regulation 2016.
Rehabilitation management plan	As defined in the Mining Regulation 2016.
Rehabilitation objectives	As defined in the Mining Regulation 2016.
Rehabilitation risk assessment	As defined in the Mining Regulation 2016.
Rehabilitation schedule	The defined timeframes for progressive rehabilitation set out in the forward program.

WORD	DEFINITION
Relevant stakeholders	Means any persons or bodies who may be affected by the mining operations, including rehabilitation, carried out on the lease land, and includes: ■ the relevant development consent authority ■ the local council ■ the relevant landholder(s) ■ community consultative committee (if required under the development consent) or equivalent consultative group ■ affected land holder(s) ■ government agencies relevant to the final land use ■ affected infrastructure authorities (electricity, telecommunications, water, pipeline, road, rail authorities) ■ local Aboriginal communities, and ■ any other person or body determined by the Minister to be a relevant stakeholder in relation to a mining lease.
Risk	The effect of uncertainty on objectives. It is measured in terms of consequences and likelihood (AS/NZS ISO 31000:2009).
Secretary	The Secretary of the Department.
Security deposit	An amount that a mining lease holder is required to provide and maintain under a mining lease condition, to secure funding for the fulfilment of obligations under the lease (including obligations that may arise in the future).
Surface disturbance	Includes activities that disturb the surface of the mining area, including mining operations, ancillary mining activities and exploration.
Tailings	A combination of the fine-grained solid material remaining after the recoverable metals and minerals have been extracted from the mined ore, and any process water[2].
Waste	Has the same meaning as that term under the *Protection of the Environment Operations Act 1997*.

[2] Commonwealth of Australia (DITR), 2007. *Tailings Management*.

Attachment 3 – Plans

Plan 2A V0.pdf

Plan 2B V0.pdf

Plan 2C V0.pdf

Luddenham Clay Mine, Plan 2A, FWP Year 1 (2024-2025)

Legend

- Forecast Data Year1
  - Forecast Disturbance
  - Forecast Land Prepared for Rehabi
  - Ecosystem and Land Use Establish
- Project Approval Boundary
- Mine Operations Area
- World Imagery
- Low Resolution 15m Imagery
- High Resolution 60cm Imagery
- High Resolution 30cm Imagery
- Citations

206.7 0 103.33 206.7 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

THIS MAP IS NOT TO BE USED FOR NAVIGATION

Notes

Date 02/12/2024
Submission IDs:
2112, 8809

Luddenham Clay Mine, Plan 2B, FWP Year 2 (2025-2026)

Legend

Forecast Data Year2

- Forecast Disturbance
- Forecast Land Prepared for Rehabi
- Ecosystem and Land Use Establish

Project Approval Boundary

Mine Operations Area

World Imagery

Low Resolution 15m Imagery

High Resolution 60cm Imagery

High Resolution 30cm Imagery

Citations

Notes

Date 02/12/2024
Submission IDs:
2112

206.7 0 103.33 206.7 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

THIS MAP IS NOT TO BE USED FOR NAVIGATION

Luddenham Clay Mine, Plan 2C, FWP Year 3 (2026-2027)

Legend

Forecast Data Year2

- Forecast Disturbance
- Forecast Land Prepared for Rehabi
- Ecosystem and Land Use Establish

Project Approval Boundary

Mine Operations Area

World Imagery

Low Resolution 15m Imagery

High Resolution 60cm Imagery

High Resolution 30cm Imagery

Citations

206.7 0 103.33 206.7 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere

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THIS MAP IS NOT TO BE USED FOR NAVIGATION

Notes

Date 02/12/2024

Submission IDs:
2112

Site Registration

Date November 2024

Complete the following fields prior to calculating the Security Deposit.

Mine Name:	Luddenham Clay Mine
Lease(s):	ML 1816
Title Holder:	Luddenham Operations Pty Ltd
Term of RCE:	2024-2027
Current Security:	$468,000
Date of last Security Deposit review	30/11/2023
Mine Contact:	Harry Scarlis
List key changes since previous submission:	Commencement of rehabilitation in accordance with the approved Rehabilitation Management Plan

Open Cut Summary Rehabilitation Cost Estimation

Note: Sections of this page are automatically filled in from the registration page

Mine Name: Luddenham Clay Mine

Lease(s): ML 1816

Authorisation Owner: Luddenham Operations Pty Ltd

Term of RCE: 2024-2027

Current Security: $468,000 **Date of Last Security Deposit Review:** 30/11/2023

Mine Contact: Harry Scarlis

Domain		Security Deposit
Domain 1: Infrastructure		$144,765
Domain 2: Tailings & Rejects		
Domain 3: Overburden & Waste		$4,162
Domain 4: Active Mine & Voids		$77,627
Domain 5: Management Activities		$113,375
Subtotal (Domains and Sundry Items)		**$339,929**
Contingency	**10%**	$33,993
Post Closure Environmental Monitoring	**10%**	$33,993
Project Management and Surveying	**10%**	$33,993
Total Security Deposit for the Mining Project (excl. of GST)		**$441,907**

Note: GST is not included in the above calculation or as part of rehabilitation security deposits required by the Department.

☐ Alterations have been made to unit prices within this spreadsheet. (Attach a separate sheet providing details of changes).

☑ The proposed rehabilitation design is generally consistent with the development consent for the project.

This mine security calculation has been estimated using the best available information at the time.
It is a true and accurate reflection of the total rehabilitation liability held by this mine.

Company Respresentative's Name **Date**

Company Representative's Role / Responsibility **Signature**

Open Cut Operations

Domain 1a: Infrastructure

Total Cost for Infrastructure Domain $144,765

Additional Assumptions: *Record any relevant assumptions to this domain below:*

	Key Rehabilitation Area Data for Domain	**Enter data below manually**
	Total Landform Establishment:	
	Total Growth Media Development:	
	Total Ecosystem Establishment:	

Management Precinct	Activity / Description	Applicable (Y or N)	Quantity	Unit	Default Unit Rate	Alternative Unit Rate	Total Cost	Basis for Costs Estimation and Additional Relevant Information	Description / Notes:
Termination of Services and Demolition Works	Demolish and remove demountable structures on concrete stumps. Assumes not being re-used	**Y**	100	m2	**$40.00**		**$4,000**		Crib huts, temporary offices and other 'non permanent' structures. Does not include transport to regional disposal facility or equivalent.
	Remove concrete pads & footings (<300 mm thickness) and disposal on-site/locally	**Y**	100	m2	**$36.00**		**$3,600**		Breaking up slab and disposal or for conversion to aggregate. Generally haulage rates will be $0.60 - $1.20 / km, depending on truck fleet, loaders etc. For off-site disposal use alternate rate option and add $0.90 / km for transport.
						Termination of Services and Demolition Works Subtotal	**$7,600**		
						Rail Infrastructure Subtotal	**$0**		
Contaminated Materials	Undertake a preliminary site investigation (Phase 1). This accounts for current and historical locations where areas of disturbance are clustered. If there are multiple cluster areas on site, multiple studies may be required.	**Y**	1	Cluster	**$15,000**		**$15,000**		The preliminary investigation would include at minimum a desktop assessment of the area and site history, incidents, etc. as per the National Environmental Protection (Site Contamination) Measure (NEPM) Phase 1 assessment (EP Act Section 389 (2) (iv)) or similar approved and recognised assessment method. A cluster may include: - Mine infrastructure (i.e., fuel / chemical store, workshop, vehicle wash-down, sewage treatment etc.) - Processing plants (i.e., ore and product storage, mine waste storage and disposal, rail load-out etc.) - Remote pit-top facilities (i.e., vehicle re-fuel, sewage treatment, secondary workshop, chemical storage etc.)
	Load, cart and disposal of Low Level contaminated material off site to a licensed landfill. Add $50/m3 for cartage to regional landfill	**Y**	500	m3	**$220.00**		**$110,000**		Includes load, haul and dump fees to a licensed facility.
						Contaminated Materials Subtotal	**$125,000**		
						Vents, Shafts and Boreholes Subtotal	**$0**		
Roads and Tracks	Unsealed roads / vehicle park-up areas – Minor earthworks, final trim and deep rip and seed (pasture grass)	**Y**	1	ha	**$3,700**		**$3,700**		D10 Dozer @ $400 per hour and 16 H grader @ $230 per hour (50% utilisation) - pasture grass seed
						Roads and Tracks Subtotal	**$3,700**		
Earthworks / Structural Works (Landform Establishment)	Minor reshaping and pushing	**Y**	0.8	ha	**$3,900**		**$3,120**		D10 Dozer @ $400 per hour and 16 H grader @ $230 per hour (50% utilisation).
	Trim, rock rake & deep rip (includes levelling / landscaping and rip in 1 direction)	**Y**	0.8	ha	**$1,130.00**		**$904**		Undertaken using D10 dozer and 16M grader.
						Earthworks / Structural Works (Landform Establishment) Subtotal	**$4,024**		
Land Preparation and Revegetation (Growth Media Development and Ecosystem Establishment)	Source, cart and spread growth media - haul distance <1 km	**Y**	800	m3	**$3.26**		**$2,605**	**< =1km**	Undertaken with 623 scraper and 14 M grader.
	Direct seeding / fertiliser (pasture grass species)	**Y**	0.8	ha	**$1,875**		**$1,500**		Includes treating, weighing, mixing with fertiliser + spreading by tractor or helicopter (aerial seeding).
	Single application of fertiliser (pasture)	**Y**	0.8	ha	**$420.00**		**$336**		Assumes 250 kg / ha. These rates have fluctuated over the last few years however in light of current conditions (lower fuel prices, reduced demand etc) this is a suitable standard rate.
						Land Preparation and Revegetation (Growth Media Development and Ecosystem Establishment) Subtotal	**$4,441**		
						Water Management Subtotal	**$0**		
						Maintenance of Rehabilitated Areas Subtotal	**$0**		
						Additional Items Subtotal	**$0**		
						Total Cost for Infrastructure Domain	**$144,765**		

Open Cut Operations

Domain 2a: Tailings & Rejects

Total Cost for Tailings & Rejects Domain $0

Additional Assumptions: *Record any relevant assumptions to this domain below:*

	Key Rehabilitation Area Data for Domain	Enter data below manually
	Total Landform Establishment:	
	Total Growth Media Development:	
	Total Ecosystem Establishment:	

Management Precinct	Activity / Description	Applicable (Y or N)	Quantity	Unit	Default Unit Rate	Alternative Unit Rate	Total Cost	Basis for Costs Estimation and Additional Relevant Information	Description / Notes:
						Contaminated Materials Subtotal	$0		
						Earthworks / Structural Works (Landform Establishment) Subtotal	$0		
						Earthworks / Structural Works (Landform Establishment) Subtotal	$0		
						Mine Waste Subtotal	$0		
						Land Preparation and Revegetation (Growth Media Development and Ecosystem Establishment) Subtotal	$0		
						Water Management Subtotal	$0		
						Maintenance of Rehabilitated Areas Subtotal	$0		
						Additional Items Subtotal	$0		
						Total Cost for Tailings & Rejects Domain	**$0**		

Open Cut Operations

Domain 3a: Overburden & Waste

Total Cost for Overburden & Waste Domain $4,162

Additional Assumptions: *Record any relevant assumptions to this domain below:*

	Key Rehabilitation Area Data for Domain	**Enter data below manually**
	Total Landform Establishment:	
	Total Growth Media Development:	
	Total Ecosystem Establishment:	

Management Precinct	Activity / Description	Applicable (Y or N)	Quantity	Unit	Default Unit Rate	Alternative Unit Rate	Total Cost	Basis for Costs Estimation and Additional Relevant Information	Description / Notes:
						Contaminated Materials Subtotal	**$0**		
						Roads and Tracks Subtotal	**$0**		
Earthworks / Structural Works (Landform Establishment)	Minor reshaping and pushing	**Y**	0.4	ha	**$3,900**		**$1,560**		D10 Dozer @ $400 per hour and 16 H grader @ $230 per hour (50% utilisation).
	Trim, rock rake & deep rip (includes levelling / landscaping and rip in 1 direction)	**Y**	0.4	ha	**$1,130.00**		**$452**		Undertaken using D10 dozer and 16M grader.
						Earthworks / Structural Works (Landform Establishment) Subtotal	**$2,012**		
						Mine Waste Subtotal	**$0**		
Land Preparation and Revegetation (Growth Media Development and Ecosystem Establishment)	Source, cart and spread growth media - haul distance <1 km	**Y**	430	m3	**$3.26**		**$1,400**	**< =1km**	Undertaken with 623 scraper and 14 M grader.
	Direct seeding / fertiliser (pasture grass species)	**Y**	0.4	ha	**$1,875**		**$750**		Includes treating, weighing, mixing with fertiliser + spreading by tractor or helicopter (aerial seeding).
						Land Preparation and Revegetation (Growth Media Development and Ecosystem Establishment) Subtotal	**$2,150**		
						Water Management Subtotal	**$0**		
						Maintenance of Rehabilitated Areas Subtotal	**$0**		
						Additional Items Subtotal	**$0**		
						Total Cost for Overburden & Waste Domain	**$4,162**		

Open Cut Operations

Domain 4a: Active Mine & Voids

Total Cost for Active Mine & Voids Domain $77,627

Additional Assumptions: *Record any relevant assumptions to this domain below:*

	Key Rehabilitation Area Data for Domain	**Enter data below manually**
	Total Landform Establishment:	
	Total Growth Media Development:	
	Total Ecosystem Establishment:	

Management Precinct	Activity / Description	Applicable (Y or N)	Quantity	Unit	Default Unit Rate	Alternative Unit Rate	Total Cost	Basis for Costs Estimation and Additional Relevant Information	Description / Notes:
						Open Cut Subtotal	**$0**		
Earthworks / Structural Works (Landform Establishment)	Minor reshaping and pushing	**Y**	7.1	ha	**$3,900**		**$27,690**		D10 Dozer @ $400 per hour and 16 H grader @ $230 per hour (50% utilisation).
	Trim, rock rake & deep rip (includes levelling / landscaping and rip in 1 direction)	**Y**	7.1	ha	**$1,130.00**		**$8,023**		Undertaken using D10 dozer and 16M grader.
						Earthworks / Structural Works (Landform Establishment) Subtotal	**$35,713**		
Land Preparation and Revegetation (Growth Media Development and Ecosystem Establishment)	Source, cart and spread growth media - haul distance <1 km	**Y**	7100	m3	**$3.26**		**$23,119**	**< =1km**	Undertaken with 623 scraper and 14 M grader.
	Direct seeding / fertiliser (pasture grass species)	**Y**	7.1	ha	**$1,875**		**$13,313**		Includes treating, weighing, mixing with fertiliser + spreading by tractor or helicopter (aerial seeding).
	Single application of fertiliser (pasture)	**Y**	7.1	ha	**$420.00**		**$2,982**		Assumes 250 kg / ha. These rates have fluctuated over the last few years however in light of current conditions (lower fuel prices, reduced demand etc) this is a suitable standard rate.
						Land Preparation and Revegetation (Growth Media Development and Ecosystem Establishment) Subtotal	**$39,414**		
Water Management	Clean water dams to be retained after decommissioning – make safe and minor earthworks	**Y**	1	allow	**$2,500**		**$2,500**		Provisional sum for earthworks and revegetation required to rehabilitate dam batters etc suitable for re-use by an alternate land-user - D6 Dozer (or similar) @ ~$200 per hour and pasture grass.
						Water Management Subtotal	**$2,500**		
						Maintenance of Rehabilitated Areas Subtotal	**$0**		
						Additional Items Subtotal	**$0**		
Total Cost for Active Mine & Voids Domain							**$77,627**		

Open Cut Operations

Domain 5a: Management Activities

Total Cost for Management Activities $113,375

Additional Assumptions: *Record any relevant assumptions to this domain below:*

	Key Rehabilitation Area Data for Domain	**Enter data below manually**
	Total Landform Establishment:	
	Total Growth Media Development:	
	Total Ecosystem Establishment:	

Management Precinct	Activity / Description	Applicable (Y or N)	Quantity	Unit	Default Unit Rate	Alternative Unit Rate	Total Cost	Basis for Costs Estimation and Additional Relevant Information	Description / Notes:
Water Management	On-site treatment of contaminated water due to high salt (includes removal of metals etc, brine disposal and cost of mobile water treatment unit)	**N**		ML	**$3,600**				Rate can fluctuate depending on treatment type however this is a suitable standard rate for current programs at mining operations.
	On-site treatment of contaminated water due to low pH (incudes removal of metals etc, neutralisation treatments and cost of mobile water treatment unit	**N**		ML	**$1,500**				Rate can fluctuate depending on treatment type however this is a suitable standard rate for current programs at mining operations.
						Water Management Subtotal	**$0**		
Creek Diversions	Repairs and/or stabilisation of new or compromised water course diversion	**N**		m	**$2,500**				Assumes material is suitable for revegetating and has a reasonable chance of stabilising.
	Long term maintenance of water course diversion – Channel constructed through backfilled material	**N**		m	**$1,500**				Assumes maintenance has been kept up and significant works are not required.
	Long term maintenance of water course diversion – Channel constructed through competent material	**N**		m	**$750.00**				Assumes maintenance has been kept up and significant works are not required.
	Installation of rock armouring	**N**		m2	**$6.00**				Assumes competent material is locally available - multiply costs by 2 for sourcing and transporting from offsite location.
						Creek Diversions Subtotal	**$0**		
Maintenance of Rehabilitated Areas	Pest management on buffer lands, non-disturbed, and rehabilitated areas	**Y**	2.5	ha	**$150.00**		**$375**		Feral animal baiting programs if required and waste materials required to be removed.
	Land management of undisturbed areas (rehabilitation, weeds, ferals, erosion and sediment control works)	**Y**	2.5	ha	**$400.00**		**$1,000**		Undisturbed areas within the lease boundary that require land management activities.
						Maintenance of Rehabilitated Areas Subtotal	**$1,375**		
Heritage Items	The restoration and care and maintenance of items that have heritage significance	**N**		allow	**Use alternate rate cell**				Item for the redistribution of Aboriginal artefacts, preservation of European heritage items or a combination of activities.
						Heritage Items Subtotal	**$0**		
Sundry Items	Development of an 'Unplanned' Project Closure Plan - State Significant Development with closure planning well progressed i.e. preferred cover design, closure environment modelled e.g. groundwater /subsidence / pit lakes, preliminary seal designs, etc. and only finalisation of detailed engineering deigns required	**Y**	1	allow	**$100,000**		**$100,000**		Provisional sum to be used to refine the conceptual closure plan into a detailed closure plan with execution strategies for rehabilitation activities. Assumes outcomes of studies readily available including modelling, landform design, geochemistry, demolition, etc. Costs to finalise options by domain and finalise designs for construction. Assume a simple site e.g. single open cut, no legacy operations historic in the area, little social dependence, etc. Depending on site size, complexity, final land use requirements and knowledge base investigations can range from ~$75k to >$1 M. Sites with more than 1 pit to add $50,000 to rate.
	Development of an 'Unplanned' Project Closure Plan - Non State Significant Development with at least ≥2 of the following aspects requiring closure planning, but no significant issues realised at this time: previous subsidence, medium or higher geochemistry risk and/or spontaneous combustion propensity, known/ likely contamination, tailings / rejects, final void	**N**		allow	**$90,000**				Provisional sum to be used to refine the conceptual closure plan into a detailed closure plan with execution strategies for rehabilitation activities. Estimated cost for developing closure plan including studies - basic to satisfy risks and decisions - includes risk assessment, options analysis, Closure Plan. Sites with more than 1 pit to add $50,000 to rate.
	Development of an 'Unplanned' Project Closure Plan - Non State Significant Development with no EPL and/or only one of the following relevant aspects: previous subsidence, low to medium geochemistry risk and/or spontaneous combustion propensity, known limited contamination, small approved final void	**N**		allow	**$15,000**				Assumes sediment control is the key concern for rehabilitation e.g. small mines, exploration operations. Includes risk assessment, sampling and analyses on <5 samples, one study and Closure Plan.

	Development of an 'Unplanned' Project Closure Plan - State Significant Development with only preliminary to conceptual closure planning in place	**N**		allow	**$300,000**				Includes costs for key investigations and studies including designs e.g. geochemistry, Contamination Remediation Action Plan, subsidence risk, cover/capping and final landform, site wide surface water, etc. Provisional sum to be used to refine the conceptual closure plan into a detailed closure plan with execution strategies for rehabilitation activities. Assume at least 15 types of studies required ranging from geotechnical to ecology and social, development of a closure plan including address of obligations. Assume a simple site e.g. single open cut, no legacy operations historic in the area, little social dependence, etc. Depending on site size, complexity, final land use requirements and knowledge base investigations can range to >$3 M. Sites with more than 1 pit to add $50,000 to rate.
	Development of an 'Unplanned' Project Closure Plan - Non State Significant Development with at least ≥2 of the following aspects resulting in significant issues requiring remediation: previous subsidence, medium or higher geochemistry risk and/or spontaneous combustion propensity, known/ likely contamination, tailings / rejects, final void	**N**		allow	**$125,000**				Includes costs for key investigations and studies including economic treatments and designs e.g. geochemistry, Contamination Remediation Action Plan, subsidence risk, cover/capping and final landform, site wide surface water, etc. Provisional sum to be used to refine the conceptual closure plan into a detailed closure plan with execution strategies for rehabilitation activities.
	Develop a Review of Environmental Factors (REF) to facilitate rehabilitation including contamination works.	**N**		allow	**$27,950**				Based on experience for a REF after completion of a detailed closure study (e.g. contamination investigation) costs could range from $10,000 to $100,000 ex GST. Note this does not apply to a Statement of Environmental Effects or Environmental Impact Statement.
	Site security during closure	**N**		yr.	**$75,000**				Provisional sum for site security measures required during closure. This includes nightly patrols and first response in the event of an out of hours incident.
	Choose type of HAZMAT Clean-up required - cleaning and decontaminating plant and equipment, chemical storage locations, oil and grease traps, tanks, vessels, and pipe work etc	**N**		allow	**$0**			**Select type of HAZMAT Clean-up Required**	Type of HAZMAT Clean-up required - cleaning and decontaminating plant and equipment, chemical storage locations, oil and grease traps, tanks, vessels, and pipe work etc
	Removal and disposal of radiation devices	**N**		each	**$31,630**				Provisional sum for removal and disposal of monitoring devices on conveyors using a radiation source (i.e., Americium – 241, Plutonium – 238, Caesium - 137 etc). Source Isotope type, quantity, strength, weight, source holder type, source holder weight, pick-up location (among others) will directly affect pricing.
	Additional fees for accessing State, Crown or other public lands for rehabilitation/remediation activities	**N**		allow	**Use alternate rate cell**				Provisional sum.
							Sundry Items Subtotal	**$100,000**	
Mobilisation and Demobilisation	Mobilisation & Demobilisation for small mine or quarry - small fleet	**Y**	1	Item	**$12,000**		**$12,000**		May include specialist demolition equipment and/or suitable plant to execute bulk earthworks as required.
	Mobilisation & Demobilisation for small mine or quarry - medium to large fleet	**N**		Item	**$35,000**				May include specialist demolition equipment and/or suitable plant to execute bulk earthworks as required.
	Mobilisation & Demobilisation (Distance to site <150 km)	**N**		item	**$100,000**				May include specialist demolition equipment and/or suitable plant to execute bulk earthworks as required.
	Mobilisation & Demobilisation (Distance to site >150 km but <500 km)	**N**		item	**$150,000**				May include specialist demolition equipment and/or suitable plant to execute bulk earthworks as required.
	Mobilisation & Demobilisation (Distance to site >500 km but <1000 km)	**N**		item	**$300,000**				May include specialist demolition equipment and/or suitable plant to execute bulk earthworks as required.
	Mobilisation & Demobilisation (Distance to site >1000 km)	**N**		item	**$500,000**				May include specialist demolition equipment and/or suitable plant to execute bulk earthworks as required.
							Mobilisation and Demobilisation Subtotal	**$12,000**	
Additional Items	Other 1 <insert>	**N**			**This is**				This item includes **<<to be added by the operator>>**
	Other 2 <insert>	**N**			**deliberately**				This item includes **<<to be added by the operator>>**
	Other 3 <insert>	**N**			**left blank**				This item includes **<<to be added by the operator>>**
							Additional Items Subtotal	**$0**	
Total Cost for Management Activities								**$113,375**	

Assumptions and rehabilitation requirements

List or record any assumptions made when completing this tool: