TRANSITIONAL PROGRESSIVE REHABILITATION AND CLOSURE PLAN

ELIMATTA COAL MINE

PREPARED FOR
NEW HOPE GROUP
on behalf of TAROOM COAL PROPRIETARY LIMITED

31 MARCH 2023

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Cover Page

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ARD	Acid Rock Drainage
AWL	Associated Water License
BoM	Bureau of Meteorology
CEC	Cation Exchange Capacity
CHPP	Coal Handling and Processing Plant
EA	Environmental Authority
EIS	Environmental Impact Statement
EP Act	*Environmental Protection Act 1994*
ERA	Environmentally relevant activity
ESP	Exchangeable Sodium Potential
EV	Environmental Dam
DES	Department of Environment and Science
FOS	Factor of safety
GAB	Great Artesian Basin
GQAL	Good Quality Agricultural Land
IA	Improvement Area
LOD	Land outcome document
LOM	Life of Mine
MDL	Mineral Development Licence
MIA	Mine Infrastructure Area
ML / MLs	Mining Lease / Mining Leases
MSES	Matter of State Environmental Significance
NUMA	Non-use management area
OEL	Occupational Exposure Level
OII	Occupational Injury/ Illness
PI	Permanent Impairment
PL	Petroleum Lease
PMLU	Post-mining land use
PoO	Plan of Operations
PRCP	Progressive Rehabilitation and Closure Plan
PRCP Guideline	Progressive Rehabilitation and Closure Plan Guideline
RA	Rehabilitation Area
RE	Regional Ecosystems
ROM	Run-of-Mine
RUSLE	Revised Universal Soil Loss Equation
RW	Raw Water Dam
SD	Sediment Dam
SILO	Scientific Information for Landowners
SEP	Stakeholder Engagement Plan
SMUs	Soil Management Units
Taroom Coal	Taroom Coal Proprietary Limited
TDN / TDNA	Surface TSFs
TDP	In-pit TSF
The Planning Guideline	Planning Guideline –The Identification of Good Quality Agricultural Land
The Project	Elimatta Project
TSF	Tailings Storage Facilities
VM Act	*Vegetation Management Act 1999*
WSL	West Surat Link
WICET	Wiggins Island Coal Export Terminal

1 Introduction

The proponent for the Elimatta Project (the Project) is Taroom Coal Proprietary Limited (Taroom Coal) which is a wholly owned subsidiary of New Hope Corporation Limited (New Hope).

AARC Environmental Solutions Pty Ltd (AARC) has been commissioned by New Hope to develop a Progressive Rehabilitation and Closure Plan (PRCP) for the Project in accordance with the requirements of the *Environmental Protection Act 1994* (EP Act).

The Project is a proposed open cut coal mine located approximately 45 km southwest of the township of Taroom in southern Queensland and approximately 380 km northwest of Brisbane (Figure 1). The Project is planned to mine up to 8.2 million tonnes per annum (Mtpa) of ROM coal to produce on average 5 Mtpa of product coal for export.

Based on an assessment of the available resource for the Environmental Impact Statement (EIS) (AARC 2014), the expected production life of the Project is in excess of 32 years. Including construction through to decommissioning, the whole-of-project life is expected to be approximately 40 years.

This PRCP is applicable to mining lease (ML) 50254, ML 50270, and ML 50271. The current version of the Environmental Authority EPML00443913 (EA) for the Project was issued on 12 May 2020 to Taroom Coal Propriety Limited.

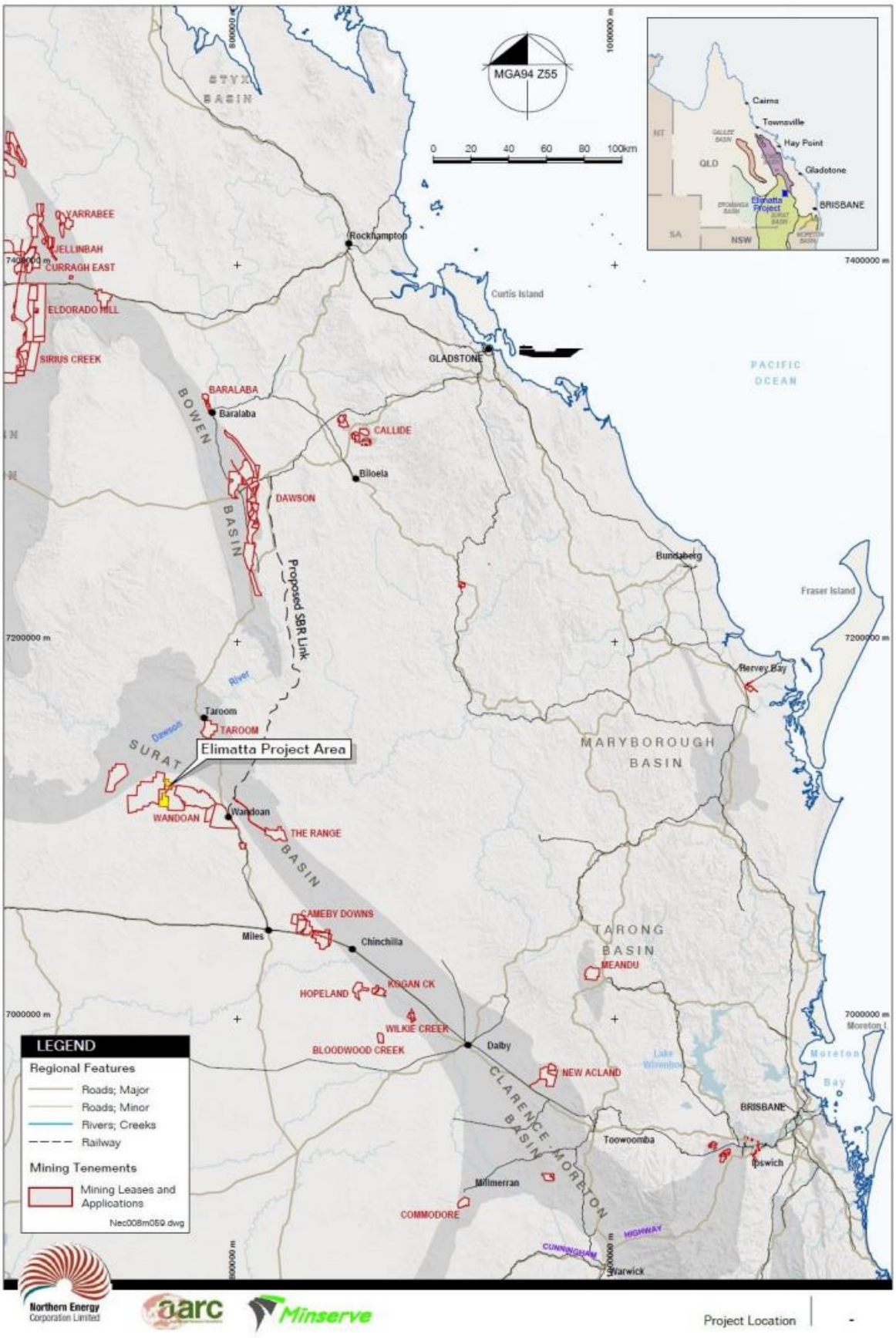

Figure 1: Project locality

2 Scope and objective

The purpose of this PRCP is to describe how progressive rehabilitation will be carried out at the Project. As the EA application for the Project was made prior to the commencement of the Progressive Rehabilitation and Closure (PRCP) provisions of the EP Act, neither the EA application, nor the EIS, is required to be accompanied by a draft PRCP. Instead, the proponent is required to separately prepare a PRCP for the Project in accordance with the timeframes stated in a notice issued by the Department of Environment and Science (DES) after the grant of the EA.

This PRCP has been prepared to align with the requirements of the EP Act, PRCP and other relevant guidelines to demonstrate that the relevant performance outcomes for land rehabilitation will be met. The PRCP has been developed in accordance with the requirements of the 'Progressive Rehabilitation and Closure Plan Guideline' (the Guideline; DES 2021), which states that the PRCP must include the following parts:

1) Rehabilitation Planning part:

The purpose of the rehabilitation planning part of the PRCP is to support and justify the development of the proposed PRCP schedule. This part must detail how progressive rehabilitation and closure will be carried out over the entire Project site and on both a rehabilitation area basis and improvement area basis. The key components of the rehabilitation planning part for the Project are:

- community consultation information (refer section 3.2);
- post-mining land use (PMLU) and/or non-use management area (NUMA) determination (refer section 3.3);
- rehabilitation and management methodology (refer section 3.5);
- risk assessment (refer section 3.6); and
- a monitoring and maintenance program (refer section 3.7).

2) Rehabilitation Schedule part:

The Rehabilitation schedule is a required element of a PRCP. Once approved, the schedule becomes a legally binding and enforceable instrument with which the Project must comply. The schedule must include:

- nomination of either a PMLU or NUMA for all land within the relevant resource tenures, including land uses for undisturbed land;
- identification of when land becomes available for rehabilitation or improvement;
- rehabilitation or management milestones to achieve the PMLU or NUMA outcomes;
- milestone criteria that demonstrate when each milestone has been completed;
- completion dates for each milestone to be achieved; and
- any conditions considered necessary or desirable.

The administering authority may impose a condition on a draft PRCP schedule or a PRCP schedule if it considers the condition is necessary or desirable (section 4.2 of the PRCP Guideline). Two deemed conditions are to be included in all PRCP schedules in accordance with section 206A of the EP Act. The first condition states that when carrying out a relevant activity under the PRCP schedule, the holder must comply with a requirement stated in the EA relevant to carrying out the activity.

The second condition states that the holder must comply with the following matters stated in the schedule:

- each rehabilitation milestone and management milestone, and
- when each rehabilitation milestone and management milestone is to be achieved.

3 Project planning part

3.1 Project planning

3.1.1 Project description

The Project activities will be undertaken across three MLs including ML 50254, ML 50270, and ML 50271; shown in Figure 3. ML 50254 will contain the proposed open-cut pit areas and stockpiles, encompassing a total area of 2,774 ha. ML 50270 will consist of the Coal Handling and Processing Plant (CHPP), rail load-out facility and other associated mine infrastructure including tailings storages and an accommodation village. ML 50270 encompasses a total area of 1,073 ha. Linking these two areas, ML 50271 will serve as a transport and services corridor for the transportation of Run-of-Mine (ROM) coal from the pit to the CHPP and has a total area of 128 ha. The maximum area proposed to be disturbed across all MLs is 3,313 ha.

Two out-of-pit dumps are planned for the Project. Overburden and interburden will be transported and disposed of in these dumps during the initial box cut and early years of mining. Thereafter, the open cut pit behind the advancing operations will be progressively backfilled and rehabilitated to minimise the total disturbance at any point in time and consequent risks to the environment. A conventional CHPP will be constructed at the Project site for coal washing. Tailings is proposed to be piped to one of two ex-pit tailings storage facilities or to an in-pit tailings dam while coarse rejects will be trucked to the waste rock emplacements. Processed wastewater will be recovered for recycling through the CHPP. Other associated infrastructure will include offices, crib rooms, warehouses, workshops, wash down bay, refuelling facility and laboratory.

A rail and services corridor is also included as part of the Project. This corridor will be a common user corridor and encompass the development of the West Surat Link (WSL) railway, as well as service infrastructure to support the Project. Product coal is to be transported via the WSL to join the Surat Basin Rail northeast of the Wandoan township. Product coal will be railed to the planned Wiggins Island Coal Export Terminal (WICET) at Gladstone for export. The development of the rail and services corridor will extend approximately 36 km, with an assumed width of 100 m, covering a total area of approximately 360 ha (Figure 2).

The principal disturbance footprints for the Project are:

- open-cut mining pits covering approximately 2,287 ha (ML 50254);
- development of an out-of-pit spoil dump over approximately 183 ha (ML 50254);
- the diversion of Horse Creek and relocation of Perretts Road from within the mining area (ML 50254);
- the development of a common user rail and services corridor to service the Project;
- construction and operation of a CHPP and associated mine infrastructure, including tailings storages and an accommodation village requiring approximately 340 ha (ML 50270);
- transportation of ROM coal from the pit to the CHPP via a dedicated haul road (ML 50271); and
- rail loading of coal at the Project site and transportation of product coal to the WICET in Gladstone.

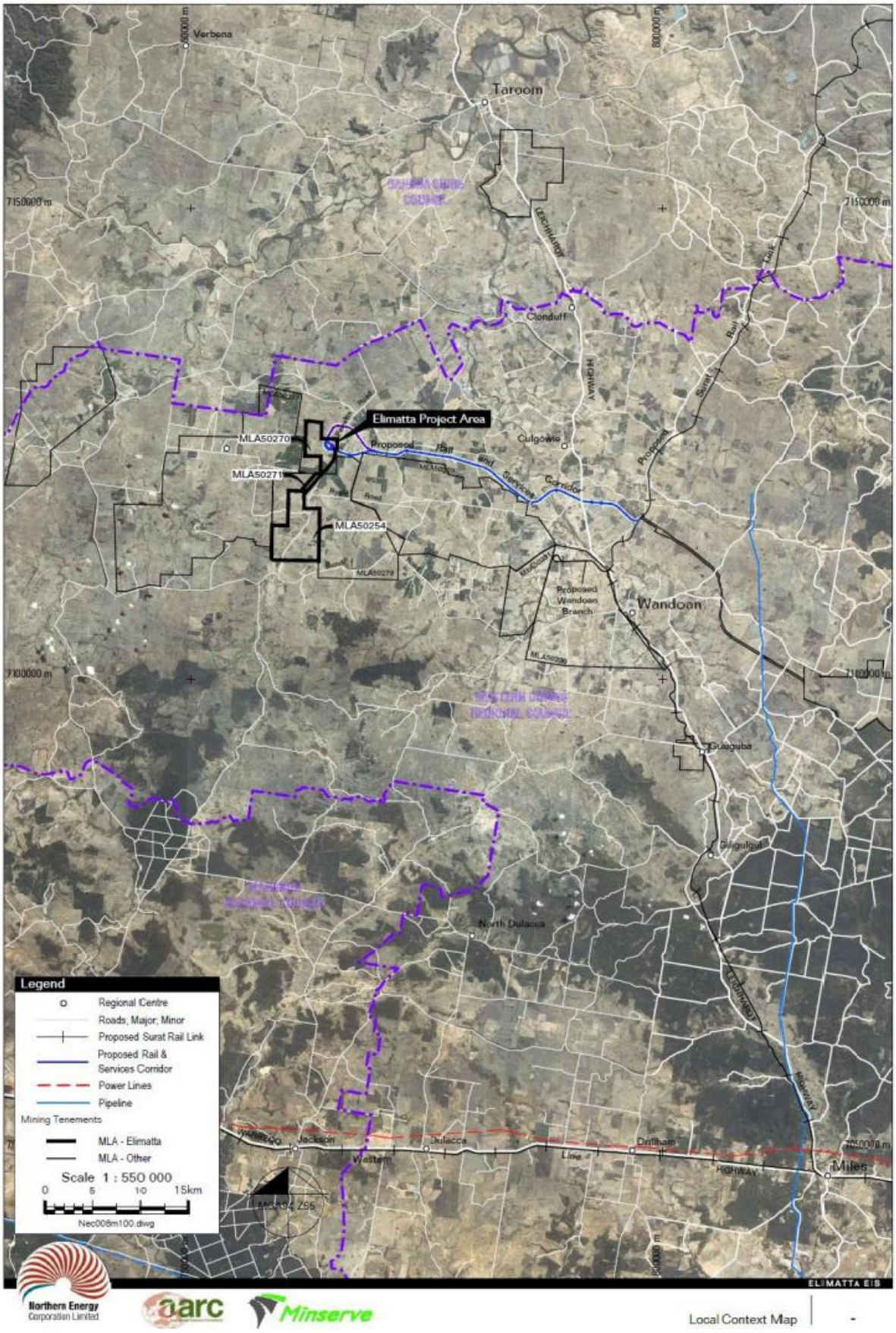

Figure 2: Regional context of the Project

3.1.1.1 Resource tenements

Taroom Coal Pty Ltd (Taroom Coal) holds the underlying exploration permit for coal (EPC) 1171. The coal and petroleum resource tenements that overlap, or are adjacent to the Project are listed in Table 1 and shown in Figure 3 and Figure 4.

Table 1: Regional coal and petroleum tenements

Authorised holder name	Tenement number	Location description
QGC Pty Limited	Petroleum Lease (PL) 277	South of ML boundaries
QGC Upstream Holdings Pty Ltd	PL 299	Within ML 50254
	PL 397	Encompassing ML 50270
	PL 1008	Northeast of MLs
	PL 498	South of ML 50270 and encompassing ML 50254 and ML 50271
	PL 507	Northwest of MLs
	PL 506	North of MLs and bordering boundary of ML 50270
	PL 505	West of ML boundaries
	PL 467	Southeast of ML boundaries
	PL 401	East of ML boundaries
	PL 464	Southern boundary of ML 50270
Australia Pacific LNG Pty Ltd	PL 408	Southwest of ML boundaries
Wandoan Holdings Pty Limited	ML 50229	West of MLs
	Mineral Development Licence (MDL) 222	West of ML 50254
	MDL 411	Bordering the eastern side of MLs
	MDL 449	Bordering the western side of MLs
	EPC 1615	West and bordering ML 50270
	EPC 1699	Northwest of MLs
	EPC 27204	Northeast of MLs
Taroom Coal Proprietary Limited	ML 50254, ML 50270, ML 50271	Project MLs
	EPC 1171	Encompassing ML 50270
Stanmore Surat Coal Pty Ltd	EPC 1274	West of MLs
	EPC 1276	North of MLs
New Acland Coal Pty Ltd	EPC 1603	Southwest border of ML 50270

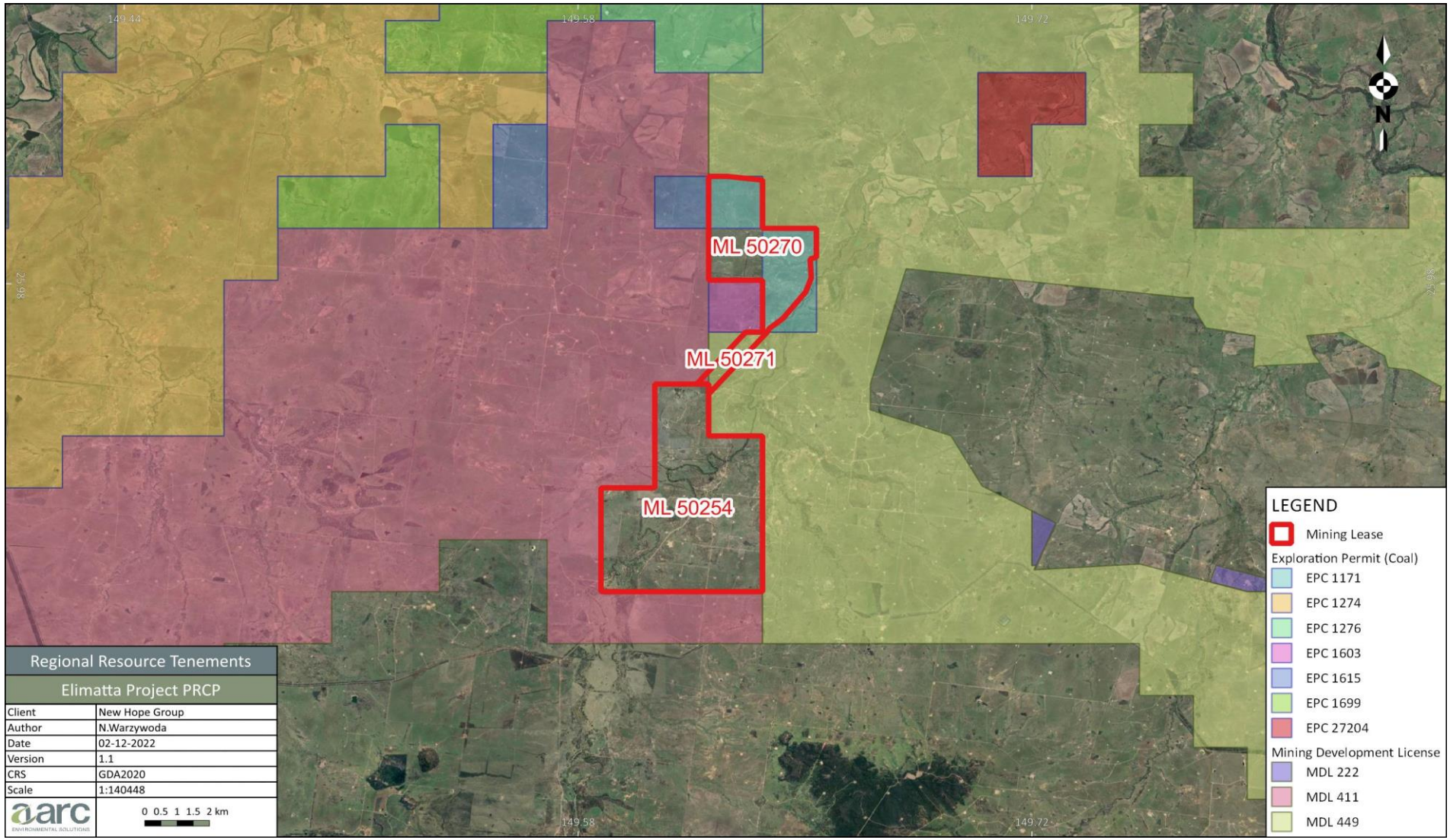

Figure 3: Adjacent and overlapping resource tenements

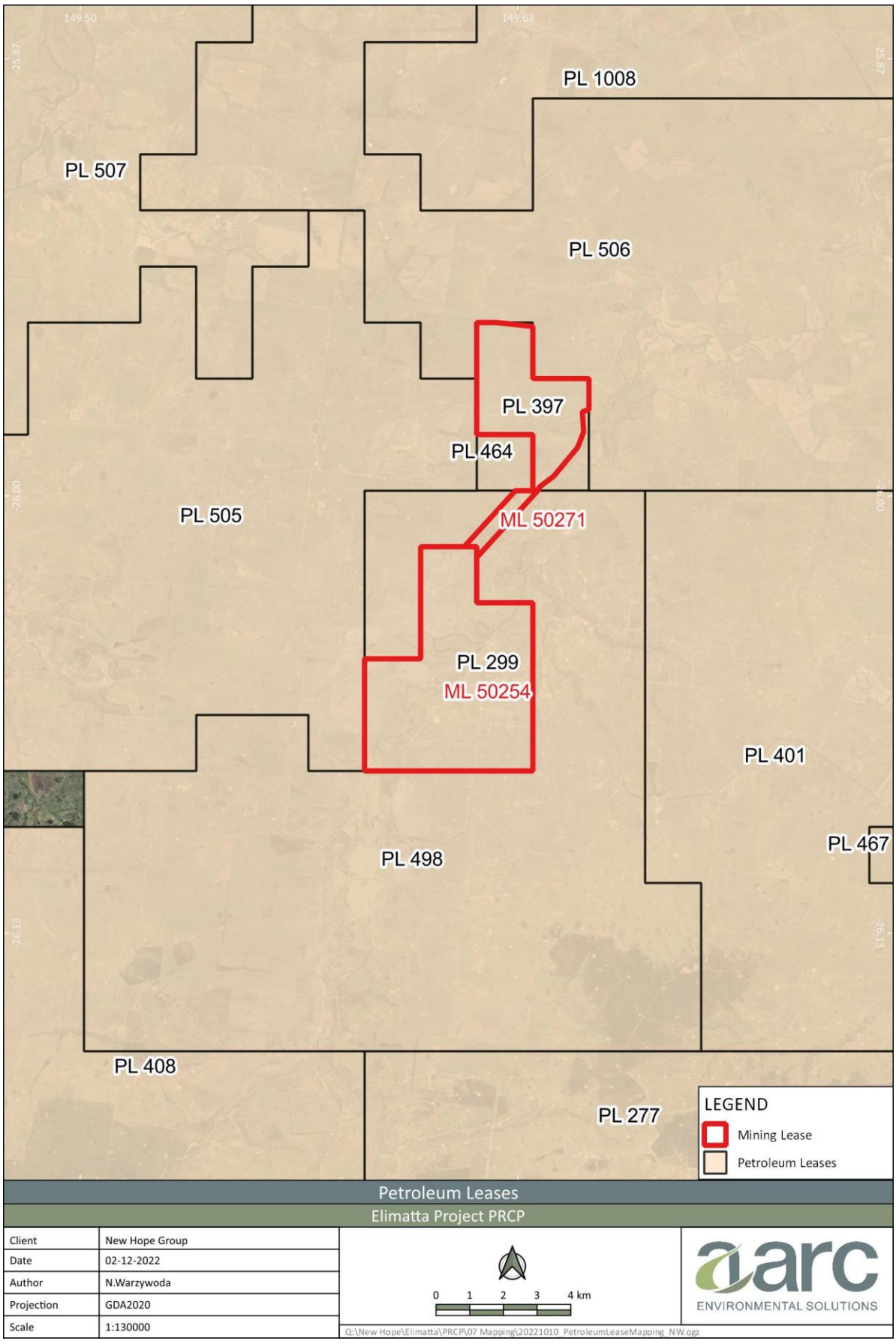

Figure 4: Adjacent petroleum tenements

3.1.1.2 Mining operations

The construction period for the Project is anticipated to span approximately 22–24 months, with operations employees on site after 13 months. The initial construction stage requires earthworks to create a platform suitable for infrastructure development and the staged installation of the accommodation village. Following the preliminary clearing of the site, earthmoving equipment will excavate areas for the initial open cut pit, spoil dumps and tailings storage facilities (TSFs), as well as clearing the mine infrastructure area (MIA) and internal transport corridors. Topsoil stripped prior to mining will be stockpiled for later use in rehabilitation. Subsequent phases of the construction program will involve the development of remaining infrastructure including the WSL, water infrastructure, CHPP, accommodation village, roads and other associated infrastructure.

The operational phase of the Project will involve open-cut mining using truck and excavator methods. Overburden and interburden will be disposed of in both in-pit and in out-of-pit waste rock emplacements located on site and contiguous with the pit excavation. ROM coal will be hauled from the pit area to the CHPP for processing via a dedicated private haul road within ML 50271. Processing will involve crushing, screening and washing to separate coal from waste materials. Fine waste rejects will be partially dewatered, with water recycled to the processing plant, and pumped thickener underflow to the dedicated TSFs. Coarse rejects will be dried and disposed of within spoil dumps.

As space becomes available, waste will be returned to in-pit dumps within the mined-out void. The in-pit dumps will similarly be connected to the sidewall access road and will contain a network of ramps constructed as required. Progressive rehabilitation will be carried out when waste rock placement has been finalised for a given area and that area is no longer required for mining operations. At this point, the area will be classified as available for rehabilitation and a sequence of rehabilitation activities will commence (refer to section 3.5).

The development of the proposed mine will result in a number of temporary public road closures, realignments and upgrades within and adjacent to the ML areas and along the rail and services corridor. The purpose of these public road works is to allow for mine operations to occur with minimum disruption to existing transport patterns and to ensure community safety.

Mining operations will commence following the construction period. The resource supports an optimal mine life in excess of 32 years, although various factors, including engineering optimisation, market conditions and environmental factors, may result in a total operational life of between 30–40 years. Including construction through to decommissioning, the estimated whole-of-project life is approximately 40 years.

3.1.2 Climate

To describe the climatic conditions of the Project area, long-term meteorological data has been obtained from weather stations proximal to the Project as per Table 2. A summary of long-term average rainfall, temperature and humidity for the region is provided in Table 3.

Table 2: Meteorological weather stations proximal to the Project

Database	Weather station	Latitude	Longitude	Approximate distance to Project
Bureau of Meteorology (BoM)	Taroom Post Office	25.64	149.79	37 km northeast
	Miles Constance Street	26.66	150.18	82 km southeast
Scientific Information for Landowners (SILO)	The Canal	25.93	149.42	24 km west

3.1.2.1 Rainfall and evaporation

The climate of the Project region is subtropical with a distinctly dry winter. The wet season generally aligns with the November to March period which accounts for over 65% of the region's average rainfall (Figure 5). Annual rainfall records for between the period of 1889-2022 are as follows.

- Taroom Post Office recorded 668 mm;
- SILO (The Canal) recorded 598 mm; and
- Miles Constance Street recorded 545 mm.

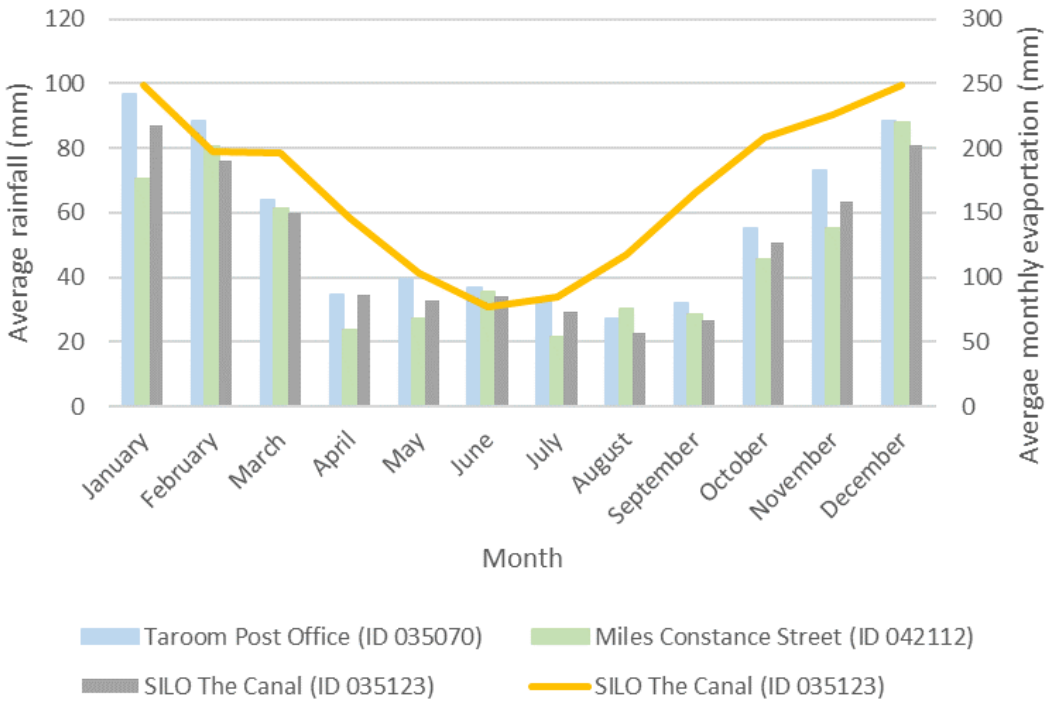

Figure 5: Regional average monthly rainfall and evaporation

Table 3: Meteorological long-term summary

Period of record	Average monthly rainfall (mm)			Average monthly temperature (°C) (minimum – maximum)			Average monthly humidity (%) (9 am – 3 pm)		Average Monthly Evaporation (mm)
	Taroom Post Office (ID 035070)	Miles Constance Street (ID 042112)	SILO The Canal (ID 035123)	Taroom Post Office (ID 035070)	Miles Constance Street (ID 042112)	SILO The Canal (ID 035123)	Taroom Post Office (ID 035070)	Miles Constance Street (ID 042112)	SILO The Canal (ID 035123)
	1952 – 2022	1997 - 2022	1889 - 2022	1952 – 2022	1997 - 2022	1889 - 2022	1952 – 2022	1997 - 2022	1889 - 2022
January	96.7	70.3	87.0	20.8 - 33.9	20.5 - 33.9	20.4 – 34.2	64 – 41	56 – 34	249.2
February	88.5	80.5	75.9	20.4 - 33.0	19.9 - 32.8	19.9 – 33.1	67 – 46	61 – 39	197.4
March	63.7	61.4	60.0	18.4 - 31.8	18.0 - 31.3	17.7 – 31.7	66 – 42	59 – 35	195.9
April	34.5	23.5	34.5	14.1 - 28.9	13.3 - 27.9	13.2 – 28.5	67 – 40	60 – 35	145.8
May	39.3	27.0	33.0	9.8 - 24.7	8.3 – 23.8	8.8 – 24.4	72 – 43	64 – 35	103.8
June	36.6	35.6	34.4	6.4 - 21.6	5.9 – 20.5	5.7 – 21.0	76 – 45	73 – 42	77.7
July	33.1	21.6	29.3	5.3 - 21.2	4.4 – 20.2	4.3 – 20.6	74 – 42	69 – 37	85.1
August	27.4	30.3	22.8	6.6 - 23.3	5.3 – 22.8	5.6 – 22.9	67 – 38	58 – 30	117.5
September	32.1	28.6	26.6	10.5 - 27.0	10.0 – 26.7	9.5 – 26.6	59 – 34	52 – 29	165.3
October	55.0	45.7	50.6	14.7 - 30.1	13.9 – 29.7	13.9 – 30.0	56 – 34	48 – 28	208.6
November	73.2	55.1	63.4	17.6 - 32.1	17.1 – 31.5	17.1 – 32.4	57 – 37	52 – 33	226.1
December	88.5	88.0	80.9	19.7 - 33.6	19.2 – 33.1	19.2 – 33.9	60 – 38	53 – 34	248.7
Annual Average	668.0	545.0	598.4	13.7 - 28.5	13.0 – 27.8	12.9 – 28.3	65 - 40	59 - 34	2021.2

Evaporation records are available from SILO (The Canal ID 035123) which recorded a potential annual average evaporation (Class A pan) of approximately 2,021 mm, approximately three times the average rainfall (Figure 5). Based on the available datasets, measured, monthly average potential evaporation is approximately three times higher than the average rainfall.

3.1.2.2 Temperature and humidity

Annual temperature records available from the Taroom Post Office (ID 035070), Miles Constance Street (ID 042112) and SILO (The Canal ID 035123) between 1889–2019 recorded average temperatures of approximately (Table 3):

- 13.7 °C (min.) to 28.5 °C (max.);
- 12.9 °C (min.) to 28.3 °C (max.); and
- 13.0 °C (min.) to 27.8 °C (max.) respectively.

Average monthly minimum and maximum relative humidity has been measured at 9:00 am and 3:00 pm at the Taroom Post Office (ID 035070) and SILO (The Canal ID 035123) with a range of 65%–40% and 59%–34% respectively (Table 3).

3.1.2.3 Long-term climate projections

In Australia, climate change is generally expected to result in a shift towards more arid conditions, warmer temperatures, and reduced rainfall. According to the Queensland Government (2019), rainfall in central Queensland is predicted to decrease due to climate change. By 2050, median annual rainfall is projected to decrease by:

- 2% under a lower emissions scenario (with emissions reduced from 'business as usual'); and
- 8% under a high emission, or 'business as usual' scenario.

Long-term climate projections predict that conditions will become warmer, with hotter and more frequent hot days. Rainfall events are predicted to become more intense, and tropical cyclones are predicted to become less frequent but more intense.

3.1.3 Geological setting

The geological setting of the Project indicates the chemical and structural integrity of the material that will be used in the construction of the final landform. The Project is located within the northern Surat basin, near the axis of the Mimosa Syncline, a major north-south trending regional feature. The Surat Basin is one of the major sedimentary sub-basins of the Great Artesian Basin. Surficial geology of the Project site corresponds to Jurassic sedimentary formations of the Injune Creeks Group with the unconsolidated Quaternary alluvium of Horse Creek dissecting the Project area.

The coal seams that make up the resource are restricted to the Juandah coal measures. The Juandah measures, along with the underlying Tangalooma Sandstone, Taroom Coal Measures and Durabilla Formation make up the Walloon sub-group. Stratigraphic bedding within the Juandah Coal Measures dips gently towards the axis of the Mimosa syncline. Seam dips are generally less than 3° but steepen locally due to seam splits.

Previous geotechnical assessments conducted for the Project EIS revealed five main groups of rock types within the overburden, coal seams, interburden and floor, as follows.

- Sandstone, quartzo-feldspathic and lithic, fine to coarse grained, pale grey to grey;
- Siltstone, variably sandy, dark grey;

- Sandstone/Siltstone, variably interbedded to interlaminated, fine to medium grained sandstone, grey/dark grey;
- Carbonaceous Mudstone/Siltstone, with thin lenses of stony coal, dark brown/black; and
- Coal, dull with bright bands, black.

Geotechnical drilling programs have identified some faulting on the Project site. Predicted faults are described as being aligned predominantly northeast-southwest in the southern part of mining areas and northwest-southeast in the northern part (Insite Geology 2010). If the fault locations, orientations and extents prove accurate, then some of the mining strip highwalls and endwalls may require special stabilisation measures when reached, as may the southern end of 'boxcut south'.

3.1.4 Topography and surface hydrology

The topography of the area consists of very gently to moderately inclined undulating hills which are dissected by Horse Creek and its tributaries. Horse Creek and its tributaries comprise creek beds, associated banks and some small alluvial plains. Horse Creek runs across and around the Project area in a north-easterly direction, while many of its tributaries move across the landscape in an east-west direction. Horse Creek flows in a general northerly direction entering Juandah Creek and, ultimately, the Dawson then Fitzroy Rivers. The alignment of Horse Creek and the Horse Creek catchment within the Project MLs is shown in Figure 6.

The catchment area of Horse Creek at the upstream boundary of the mine site is 539 km^2 increasing in size to 746 km^2 at the downstream boundary of the mine site. The headwaters of the catchment run along the Great Dividing Range at the southern boundary of the catchment, with elevations ranging between 350 m and 400 m. The eastern and western catchment boundaries are defined by a lower divide, with elevations also ranging between RL 350 m and RL 400 m. The ground levels in the vicinity of the mine site are typically around RL 250 m, with the Horse Creek invert bed levels being approximately 5 m lower than the surrounding general ground levels.

The Project site has an average elevation of approximately 250 mAHD. There are multiple hillcrests throughout the Project area with the highest elevation of 292 mAHD in the far northwest of the Project area and the lowest point at 228 mAHD occurring on a small alluvial plain at the north-eastern boundary. The topography on the site reflects much of the surrounding region.

3.1.5 Groundwater

The Project area is on the eastern edge of the Surat Basin and is underlain by over 1,000 m of shallow-dipping sediments. The Surat Basin is a structural subdivision of the Great Artesian Basin (GAB).

The waterways of the Project area fall within the southern tributaries of the Upper Dawson River Sub-basin, which is within the broader Fitzroy Basin. The Environmental Protection (Water and Wetland Biodiversity) Policy 2019 nominates the *Environmental Protection (Water) Policy 2009 Dawson River Sub-basin Environmental Values and Water Quality Objectives Basin No. 130 (part), including all waters of the Dawson River Sub-basin except the Callide Creek Catchment* (State of Queensland 2011) as setting out the environmental values for this catchment.

The Water Resource (Fitzroy Basin) Plan 2011 sets out the allocation and sustainable management of water resources in the Fitzroy Basin. The Water Resource (Fitzroy Basin) Plan 2011 identifies outcomes for sustainable management of water, including outcomes for the water plan area, general outcomes, specific surface and groundwater outcomes, as well as general and specific ecological outcomes. Also included in the Water Resources (Fitzroy Basin) Plan 2011 are performance indicators and objectives.

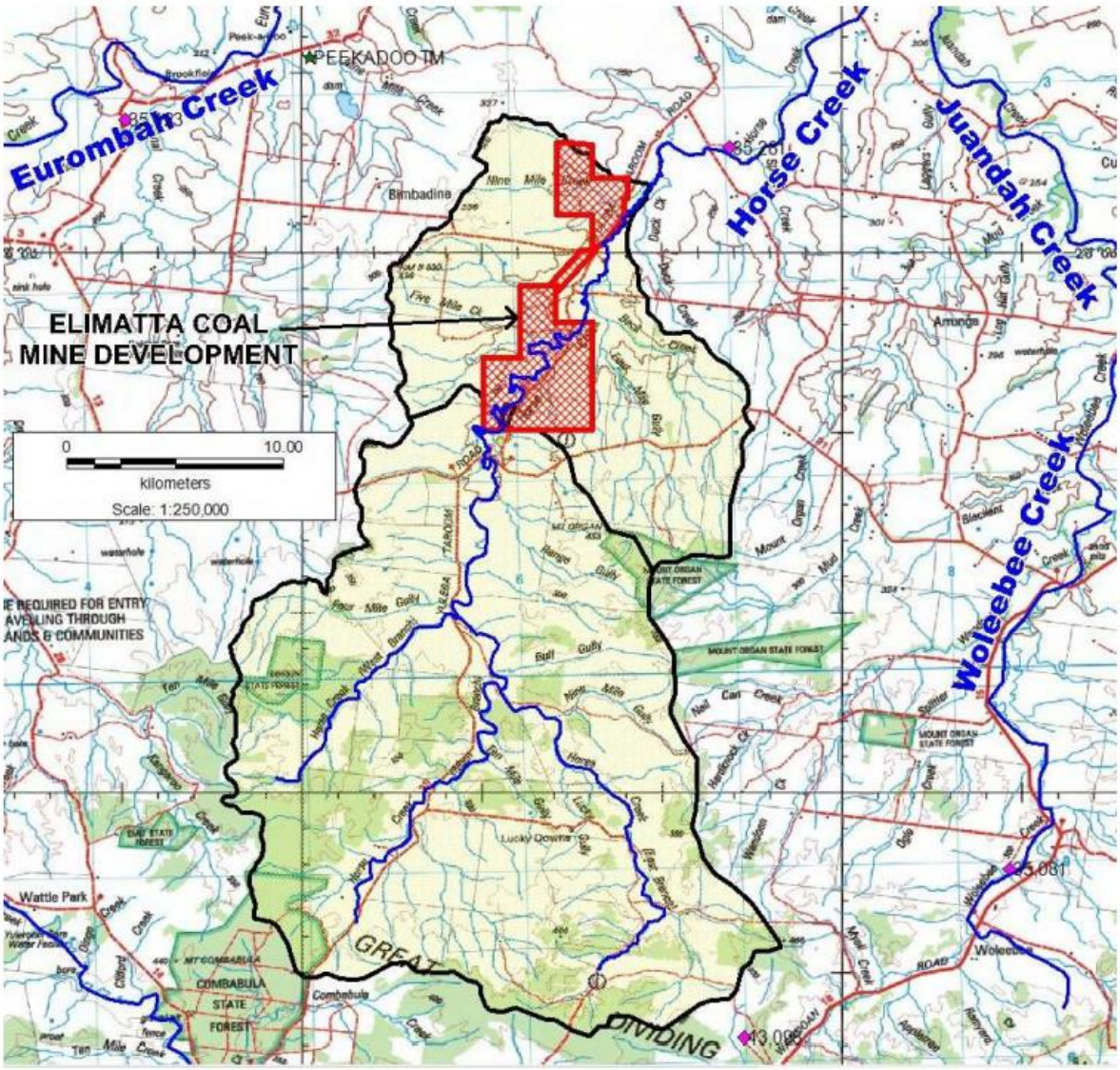

Figure 6: Horse Creek catchment showing the Project MLs

The GAB is a hydrogeological basin comprising various parts of other geologic basins. Within the Project area, the GAB includes the Surat Basin and the upper sedimentary sequences of the Bowen Basin. The main aquifer systems in the GAB in the Project area are the Gubberamunda Sandstone, Springbok Sandstone, Hutton Sandstone and Precipice Sandstone.

The Gubberamunda Sandstone is remote from the Project site, and the Hutton and Precipice Sandstones are located at significant depth below the proposed mining sequence. While the Springbok Sandstone is shown on geological maps as being present in the Project area, exploration drilling within the MLs did not detect an upper sandstone unit that could be classified as an aquifer.

The Precipice Sandstone forms a significant aquifer of the GAB, providing high yields of good quality water. In the Project area it occurs at a depth of about 825 m. It is a confined aquifer, that is, it is separated and hydraulically isolated from the overlying formations, and the potential impact from mining, by substantial thicknesses of fine grained, essentially impermeable sedimentary rocks that include the Evergreen Formation, mudstone and siltstone units within the Hutton Sandstone and lower sections of the Walloon Coal Measures.

The Hutton Sandstone is also a major confined aquifer system which provides reasonable to high yields and good quality water. In the Project area it occurs at a depth of about 400 m; however, it is also hydraulically

isolated from overlying aquifers and the potential for impact from the proposed mine sites by large thicknesses of intervening mudstones and siltstones.

The Gubberamunda Sandstone can form a productive aquifer. It outcrops about 5 km to the south of the Project in a long east-west trending ridge line and is not present in the proposed mining area. It provides supplies of low salinity water for both stock and domestic purposes.

The Walloon Coal Measures form a moderate to poor aquifer system. The main water bearing strata are the coal seams with individual seams being confined by overlying siltstone and mudstone beds. As discussed they sub-crop to the north and become deeper to the south-west.

3.1.5.1 Groundwater bores

A current search of the registered groundwater bores surrounding the Project site showed 85 registered bores within approximately 15 km of the Project MLs, of which 36 are abandoned and destroyed and three are abandoned but still useable (Table 4 and Figure 7).

Table 4: Registered groundwater bores

Registered bore number	Coordinates		Description
	Latitude	Longitude	
11590	-26.08	149.53	Existing
14618	-25.96	149.54	Existing
14632	-26.05	149.61	Existing
14648	-25.99	149.50	Existing
14743	-26.11	149.59	Existing
15838	-25.99	149.72	Existing
16598	-25.89	149.57	Existing
17753	-25.99	149.70	Existing
33821	-26.12	149.58	Existing
34709	-26.11	149.66	Existing
34718	-26.09	149.73	Existing
34929	-26.09	149.70	Existing
43380	-25.99	149.69	Existing
44246	-26.04	149.64	Existing
58022	-25.92	149.55	Existing
58079	-26.05	149.68	Existing
58242	-25.94	149.53	Existing
58282	-26.08	149.72	Existing
58301	-25.97	149.72	Existing
58302	-25.96	149.68	Existing

Registered bore number	Coordinates		Description
	Latitude	Longitude	
58306	-25.92	149.59	Existing
58600	-26.05	149.53	Existing
58850	-26.04	149.71	Existing
58968	-25.98	149.57	Existing
123300	-26.13	149.53	Existing
123504	-26.09	149.63	Existing
123533	-26.00	149.54	Existing
123653	-26.03	149.62	Existing
123654	-26.03	149.63	Existing
123655	-26.03	149.63	Existing
123656	-26.03	149.63	Existing
123674	-26.03	149.66	Existing
160508	-25.91	149.54	Existing
160509	-25.91	149.54	Existing
160510	-26.11	149.73	Existing
160511	-26.11	149.72	Existing
160512	-26.12	149.70	Existing
160576	-26.12	149.73	Existing
160577	-26.12	149.69	Existing
160579	-26.11	149.71	Existing
160714	-26.02	149.65	Existing
160722	-26.09	149.63	Existing
160863	-26.03	149.66	Existing
160883	-25.91	149.54	Existing
168270	-26.14	149.58	Existing
180018	-26.09	149.62	Existing
180062	-26.03	149.62	Existing
180066	-25.95	149.69	Existing
180068	-26.07	149.52	Existing
58537	-26.04	149.65	Abandoned but Still Usable
192518	-26.06	149.60	Abandoned but Still Usable

Registered bore number	Coordinates		Description
	Latitude	Longitude	
192541	-26.10	149.54	Abandoned but Still Usable
11714	-25.94	149.51	Abandoned and Destroyed
14595	-25.98	149.65	Abandoned and Destroyed
14596	-26.00	149.64	Abandoned and Destroyed
14631	-26.03	149.64	Abandoned and Destroyed
14633	-26.03	149.60	Abandoned and Destroyed
14744	-26.08	149.59	Abandoned and Destroyed
14745	-26.13	149.58	Abandoned and Destroyed
14889	-25.95	149.67	Abandoned and Destroyed
15856	-26.10	149.70	Abandoned and Destroyed
15898	-25.99	149.51	Abandoned and Destroyed
15989	-26.09	149.59	Abandoned and Destroyed
16119	-26.00	149.53	Abandoned and Destroyed
16298	-26.10	149.67	Abandoned and Destroyed
16789	-26.12	149.69	Abandoned and Destroyed
26300	-26.14	149.70	Abandoned and Destroyed
32259	-26.14	149.57	Abandoned and Destroyed
33435	-26.15	149.61	Abandoned and Destroyed
34708	-26.10	149.66	Abandoned and Destroyed
34951	-25.99	149.66	Abandoned and Destroyed
37949	-25.99	149.55	Abandoned and Destroyed
44605	-26.08	149.66	Abandoned and Destroyed
48810	-26.01	149.54	Abandoned and Destroyed
48965	-26.15	149.64	Abandoned and Destroyed
58064	-25.99	149.66	Abandoned and Destroyed
58077	-26.00	149.58	Abandoned and Destroyed
58297	-26.07	149.69	Abandoned and Destroyed
58320	-26.04	149.50	Abandoned and Destroyed
58462	-25.98	149.65	Abandoned and Destroyed
58541	-25.99	149.59	Abandoned and Destroyed
58612	-25.99	149.55	Abandoned and Destroyed

Registered bore number	Coordinates		Description
	Latitude	Longitude	
58768	-26.09	149.63	Abandoned and Destroyed
58967	-26.15	149.63	Abandoned and Destroyed
192520	-26.04	149.64	Abandoned and Destroyed
192521	-25.93	149.71	Abandoned and Destroyed

3.1.5.2 Water levels and flow

Groundwater levels within the constructed bores were measured during four baseline monitoring events that were undertaken between October 2009 and July 2011. The measured levels generally indicate the potentiometric surface is a subdued reflection of the surface topography with groundwater flow generally from south to north.

Regional scale studies in the Surat Basin support baseline monitoring results and generally report groundwater flow occurs from the recharge areas (that outcrop in an arc from Warwick to Roma) to the south, south-west and west (QWC 2012). The exception to this is the northern portion of the Surat Basin which is located within the Fitzroy River catchment and north of the Great Dividing Range. In the Wandoan region (north of the Great Dividing Range), available data indicates groundwater generally flows towards the north-northeast. Hodgkinson et al. (2009), noted that topography controls hydraulic gradients in shallow systems with groundwater flow from recharge areas towards the south, south-west and west, but with a minor northern flow component in some aquifers. Water level measurements in the monitoring bore network installed in the Walloon Coal Measures for the Project confirm this northerly groundwater flow direction. Asia Pacific LNG (2012) assessed flow directions in the deeper underlying Hutton Sandstone and reported a northerly flow direction in the region north of the Great Dividing Range.

Along the alignment of Horse Creek, groundwater levels in the coal measures fall from about 240 mAHD to 223 m AHD, a gentle gradient of 13 m over 6.3 km (1 m in 484 m).

Paired bores are present at several sites constructed in the alluvium and coal measures. Several of these sites indicate the water head in the alluvium is higher than in the coal measures, indicating that the Horse Creek alluvium likely recharges the underlying coal measures during periods of sustained rainfall.

3.1.5.3 Aquifer properties

Falling head permeability tests were conducted in each of the monitoring bores. The tests evaluated the hydraulic conductivity of aquifer material surrounding the bore screen. The data suggests that the coal seam has a permeability of around 0.05 m/day to 1.4 m/day, which is relatively permeable for coal.

Topography to the north has the most obvious influence on the groundwater levels and flow directions, not the dip of the coal seams which is generally to the south.

Insite Geology (2009) assessed the geotechnical conditions at the Project site and identified five main faults interpreted from various exploration programmes. All faults were inferred to be sub-vertical normal faults with the distance of throw from 1 m to 35 m.

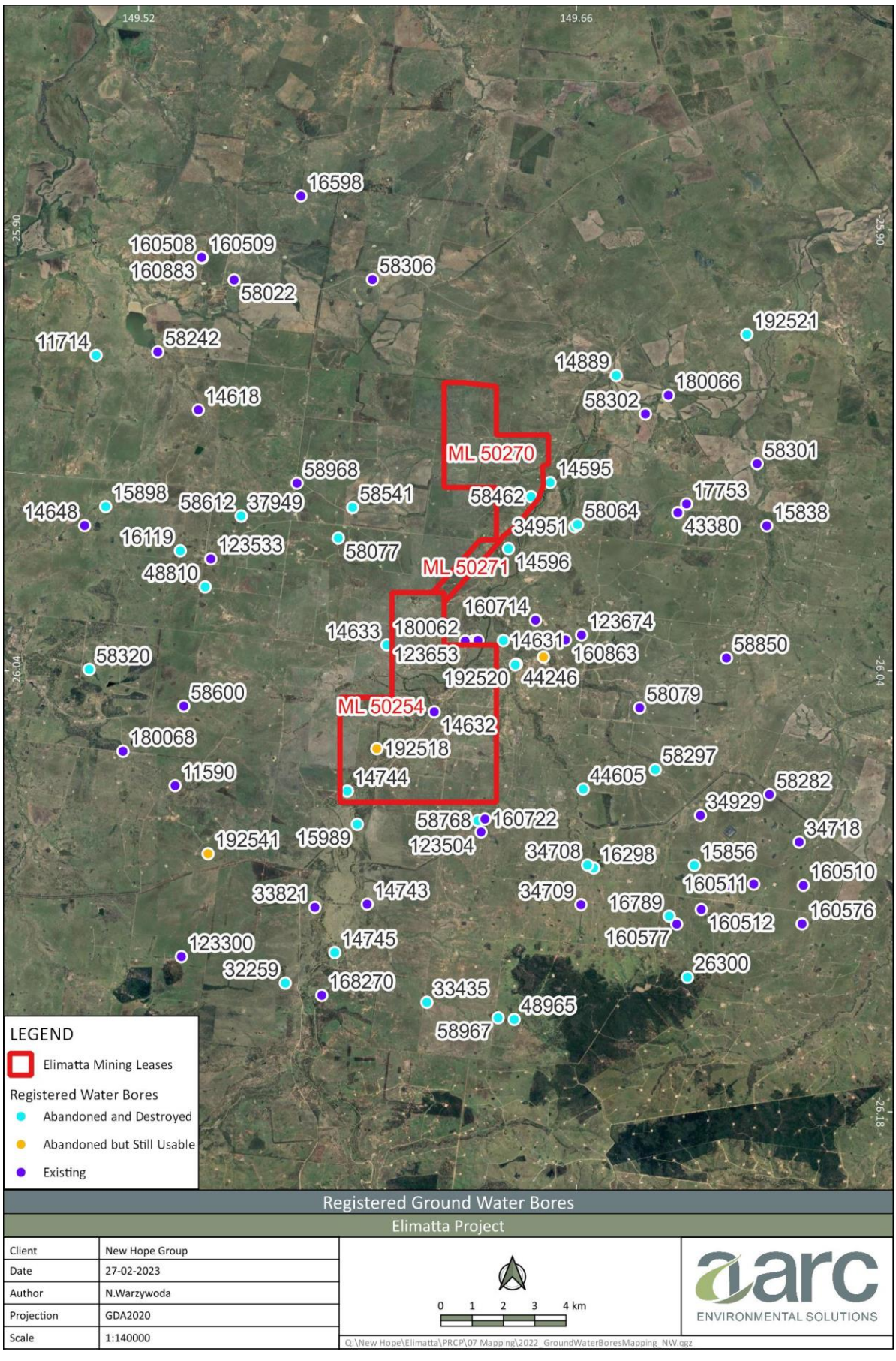

Figure 7: Registered groundwater bores

The faults generally trend down-dip and will be gradually removed by mining. During the mining process, the faults will be exposed in the highwall and are likely to drain and depressurise along the fault plane. Features of such fault zones include the undamaged rock, the damaged (fractured) zone and the core (gouge) zone. The hydraulic properties of these zones will control the magnitude of the drainage and depressurisation. The water pressures and the cross-sectional area of the fractured material around the fault plane control the volume and rate of water transferred through the fault. The cross-sectional area of a fault plane is typically much less than the cross-sectional area of other strata exposed by mining (including the coal seams). This implies then that faults typically only contribute in a minor way to the depressurisation and drainage induced by mining.

However, it is only when mining commences and depressurisation of the coal seams and overlying strata occurs that the influence of structure or hydraulic conductivity variability may become apparent.

3.1.5.4 Groundwater recharge

Groundwater recharge to coal seam aquifers is derived from two sources:

- infiltration of incident rainfall; and
- via intersection of the coal seam outcrops or shallow overburden with surface water sources.

The actual volume of rainfall that recharges is a function of rainfall intensity, evaporation rates, topography and the permeability of the surficial soils. Limited data is available on the annual recharge volume of the shallow alluvial aquifers or sandstone beds of the GAB.

The calibrated recharge rates used in the groundwater model for the Project were based on the percentage of incident rainfall that infiltrates as deep drainage, using a long-term average annual rainfall of 653.8 mm per year (AGE, 2012). On this basis, calibrated recharge rates from the model were 0.00131 mm/year for the Walloon Coal Measures, and 1.08116 mm/year for the Gubberamunda sandstone.

While the increased coarse fraction of sediments from the proposed spoil dumps are expected to increase recharge rates at 10% of the average annual rainfall, it is unlikely that this increase will result in adverse impacts on groundwater recharge within the Project region (AGE, 2012).

3.1.5.5 Groundwater quality

Groundwater quality varies across the Project area from fresh to saline. Salinity is generally lower within the alluvial deposits than within the Walloon Coal Measures which are typically more saline in nature. This higher salinity is most likely a result of lower recharge rates to the coal measures and greater groundwater residence times increasing water/rock interaction and mineral dissolution.

3.1.5.6 Groundwater resource use

The Hutton and Precipice Sandstone aquifers are both aquifers in the GAB. These deep aquifers provide the main source of water for the area including the Wandoan town bores and other community bores (Juandah, Bimbadeen and Grosmont bores). The pastoral landowners and the grazing industry throughout the district maintain a high level of dependence on these deep aquifers, which are therefore of high environmental value.

The groundwater is generally suitable for stock, which is the most common use of groundwater in the region surrounding the Project. Typically, the groundwater within the Walloon Coal Measures and alluvium is suitable for horses, pigs, sheep and beef cattle. However, in some instances the salinity of the water could cause a loss of production. The water is generally unsuitable for watering of poultry and dairy cattle.

There are no known users of groundwater for industrial or recreational purposes within the Project area.

3.1.6 Land and soil

3.1.6.1 Native title

Native Title claimants over the wider region are the Iman People #2 (claim number QC97/55). This claim is for an area covering approximately 14,025 km^2 in central and southwest Queensland. The approximate extent of this area is from Wandoan in the south-east, to Pony Hills in the west, to Glenhaughton in the north. The Project is situated in the central southern part of this claim.

Iman People #2 are also Native Title claimants over the area encompassing the rail and services corridor (Claim Number QC97/55).

3.1.6.2 Underlying landholders

A cadastral map of the Project site is shown in Figure 8. Details of the properties underlying the ML areas (excluding the rail corridor) are provided in Table 5.

Table 5: Land and landholders underlying the Project

Mining Lease	Lot plan	Plan	Tenure
ML 50254	3	SP291123	Freehold
	33	SP277380	Freehold
	3	SP317347*	Freehold**
	37	AB180	Freehold
	43	AB222	Reserve**
	2	SP317347	Freehold
	1	SP317347*	Freehold
	A	AB840860	Easement
	043	AB222	Lands Lease**
	1	SP103977	Freehold
ML 50271	3	SP317347*	Freehold
	1	SP317347*	Freehold
ML 20270	132	SP316822	Freehold
	1	SP317347*	Freehold
	60	FT900	Freehold
	46	FT64	Freehold

* denotes a property underlies more than one tenement
** denotes tenures that are within the same area

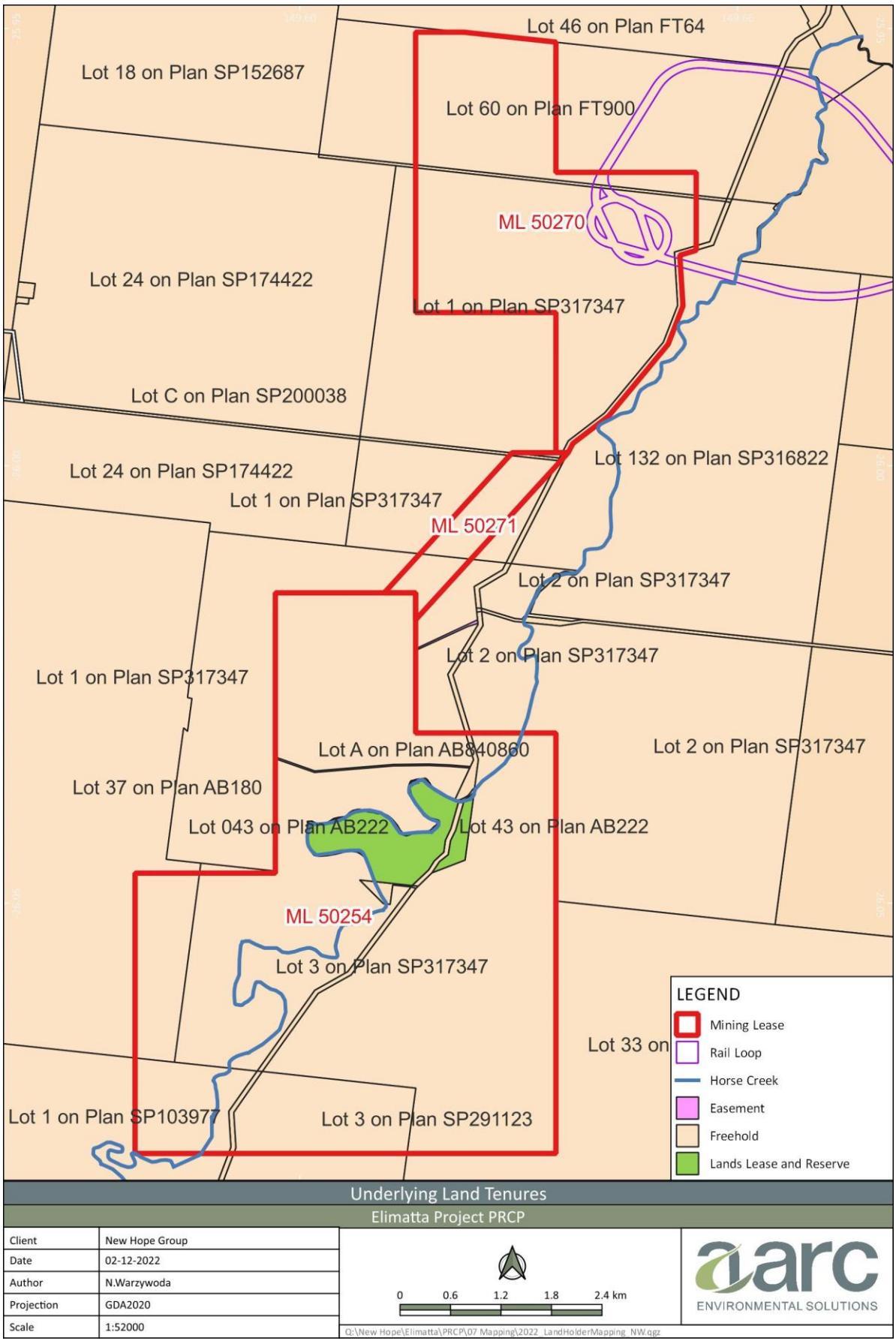

Figure 8: Land tenure associated with the Project MLs

3.1.6.3 Sensitive receptors

The noise impact assessment (ASK Consulting Engineers 2014) developed for the Project EIS identified 12 sensitive receivers within 5 km of the southern lease boundary; albeit buffered by various degrees of vegetation. Sensitive receivers south of ML 50254 are subject to significant visual impacts associated with mining operations and stockpiles.

The northern lease (ML 50270) consists of the MIA, two surface TSFs, and the anticipated mining village. There are three sensitive receivers surrounding this ML.

3.1.6.4 Land use

The dominant current land use within the ML areas is low to medium intensity cattle grazing on native and improved pastures, along with the less common dryland forage cropping. Other land uses common in the region surrounding the Project area include dryland cereal cropping.

The current land use within the rail and services corridor is predominantly grazing. Approximately 40% of the corridor length has been cropped several times in the last 15 years, however, there are no areas where cropping has occurred every year.

The Queensland Land Use Mapping (ALUM) provides classifications for the various land uses that occur within the Project area (ABARES 2016), and are presented in Table 6.

Table 6: Australian land use and management classification (ABARES 2016)

Current land use	ALUM classification	Description
Cattle grazing on native pastures	Grazing native vegetation	Land uses based on grazing by domestic stock on native vegetation where there has been limited or no deliberate attempt at pasture modification.
Cattle grazing on improved pastures	Grazing modified pastures	Pasture and forage production, both annual and perennial, based on significant active modification or replacement of the initial vegetation.
Dryland forage cropping	Cropping	Land that is under cropping and in a rotation system such that different areas will be cropped while others are left available. These are classified by the primary use (i.e. pasture).
Dryland cereal cropping		

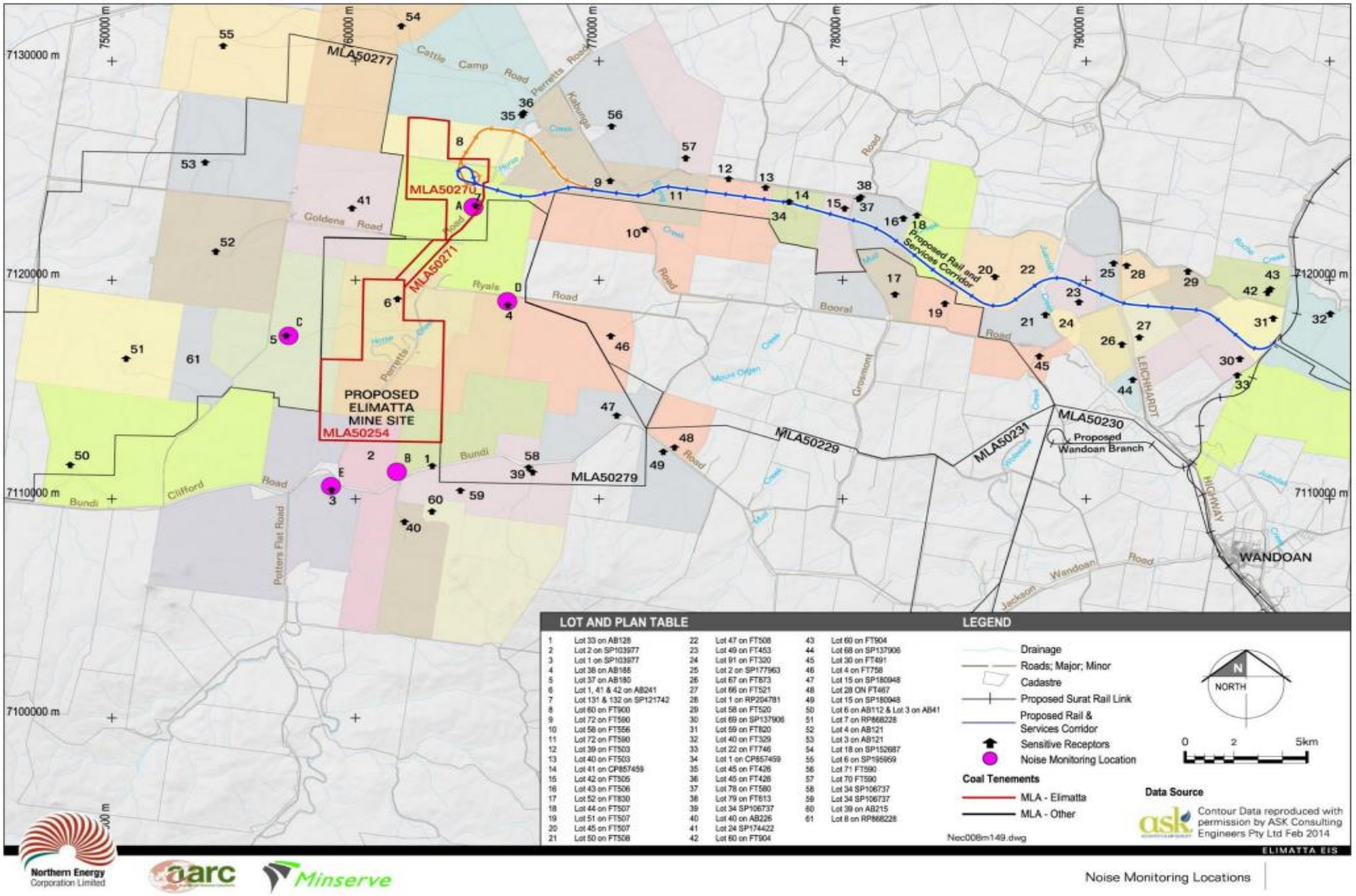

Figure 9: Baseline noise monitoring locations and sensitive receptors

3.1.6.5 Soil types and properties

Baseline condition soil resources at the Project site were assessed for the EIS (AARC 2014) through the classification, testing and mapping of soils and description of the terrain.

Based on field and laboratory assessments, six Soil Management Units (SMUs) were identified within the Elimatta ML areas. These were classified as the Downfall, Kinnoul, Cheshire, Rolleston, Juandah and Horse Creek Alluvium SMUs, consistent with descriptions provided in the *Land Management Field Manual – Wandoan District* (Gray and Macnish 1985). Table 7 provides a description of the six SMUs identified on the Project site. The distribution of each SMU within the Project ML areas is shown in Figure 10.

Table 7: Soil Management Units associated with the Project area

Soil management unit (SMU)	Australian soil classification	Description
Downfall	Grey Vertosol	The Downfall SMU consists of a brownish grey medium to heavy clay with self-mulching characteristics. The soil is generally alkaline, decreasing to acid with depth, and sodic and saline below 600 mm. Soil chemistry indicates low to moderate levels of major soil nutrients at the surface and a relatively good physical stability. The depth of useable soil resources extends to approximately 200 mm before sodicity and salinity potentially constrains usability. Landscapes of the Downfall SMU consist primarily of gently broad ridge crest and upper slopes. Soils of the Downfall SMU are distributed over approximately 405 ha of the Project site.
Kinnoul	Brown Dermosol	The Kinnoul SMU consists of primarily shallow light to medium non-cracking clay to 600 mm. pH generally increases slightly with depth from moderately to strongly alkaline. Surface soils are considered non-sodic at shallow depths of less than 100 mm. However, sodicity increases rapidly throughout the profile to levels considered sodic by 100 mm. This soil has moderate fertility, although decreasing with depth. Due to high levels of sodicity, the depth of the useable soil resource is limited to the surficial 100 mm. The distribution of the Kinnoul SMU is typically to areas within the hillcrest and upper slopes within the Project ML. These areas have been mostly cleared for grazing and have moderate slopes. Soils of the Kinnoul SMU are distributed over approximately 862 ha of the Project site.
Cheshire	Brown Dermosol	The Cheshire SMU comprises of brown to black noncracking clay with a profile similar to Kinnoul, but with depths exceeding 600 mm. Soil chemistry indicates a soil which is mildly to moderately alkaline in pH. At the surface the soil has mostly low levels of major soil nutrients and organic carbon but has a high to very high cation exchange capacity (CEC) and is well structured and stable. Surface soils are non-saline and non-sodic before becoming sodic at 300 mm. The depth of useable soil resources extends to approximately 300 mm before sodicity and salinity potentially constrains usability. Landscapes of the Cheshire SMU consist of the upper to mid slopes of gently undulating plains which have been extensively cleared for agriculture. Soils of the Cheshire SMU are distributed over approximately 966 ha of the Project site

Soil management unit (SMU)	Australian soil classification	Description
Rolleston	Grey Vertosol	The Rolleston SMU consists primarily of a cracking brownish black to brownish grey clayey medium to heavy textured upper horizon with an abrupt change at approximately 600 mm to a saline and sodic B horizon. The soil's chemical properties demonstrate increasing sodicity, salinity and decreasing organic carbon throughout the profile. Surface soils exhibit moderate fertility with low levels of major soil nutrients, particularly nitrate nitrogen and phosphorous. Due to increasing levels of sodicity, the depth of the useable soil resource is limited to the surficial 200 mm. These soils are restricted in distribution across the upper to lower slopes of the area. These areas have been mostly cleared for grazing and exhibit signs of erosion. Soils of the Rolleston SMU are distributed over approximately 137 ha of the Project site.
Juandah	Grey Vertosol	The Juandah SMU consists of strongly coloured, often black, silty heavy alluvial clay. Generally soils of this management unit have depths exceeding 1,000 mm with noticeably higher clay/silt content than the soils found in adjacent areas. A high CEC and exchangeable sodium potential (ESP) are common characteristics of this soil type. The soil resource is not considered useable due to physiochemical variability and high levels of sodicity. These soils are restricted in their distribution to the narrow valley floors of the Elimatta ML and often only occur in small localised areas. These areas are often sparsely vegetated with Eucalypt vegetation. Soils of the Juandah SMU are distributed over approximately 778 ha of the Project site.
Horse Creek Alluvium	Brown Tenosol	The Horse Creek Alluvium SMU comprises of a light, brown coloured sandy clay loam material of varying depth. This soil type presents no limitation to useability throughout the profile. Soils tend to be non-sodic throughout the profile and have poor fertility and very low levels of major soil nutrients. These soils are most commonly restricted to the immediate alluvia areas close to active waterways and older sandy alluvial areas. Soils of the Horse Creek Alluvium SMU are distributed over approximately 837 ha of the Project site.

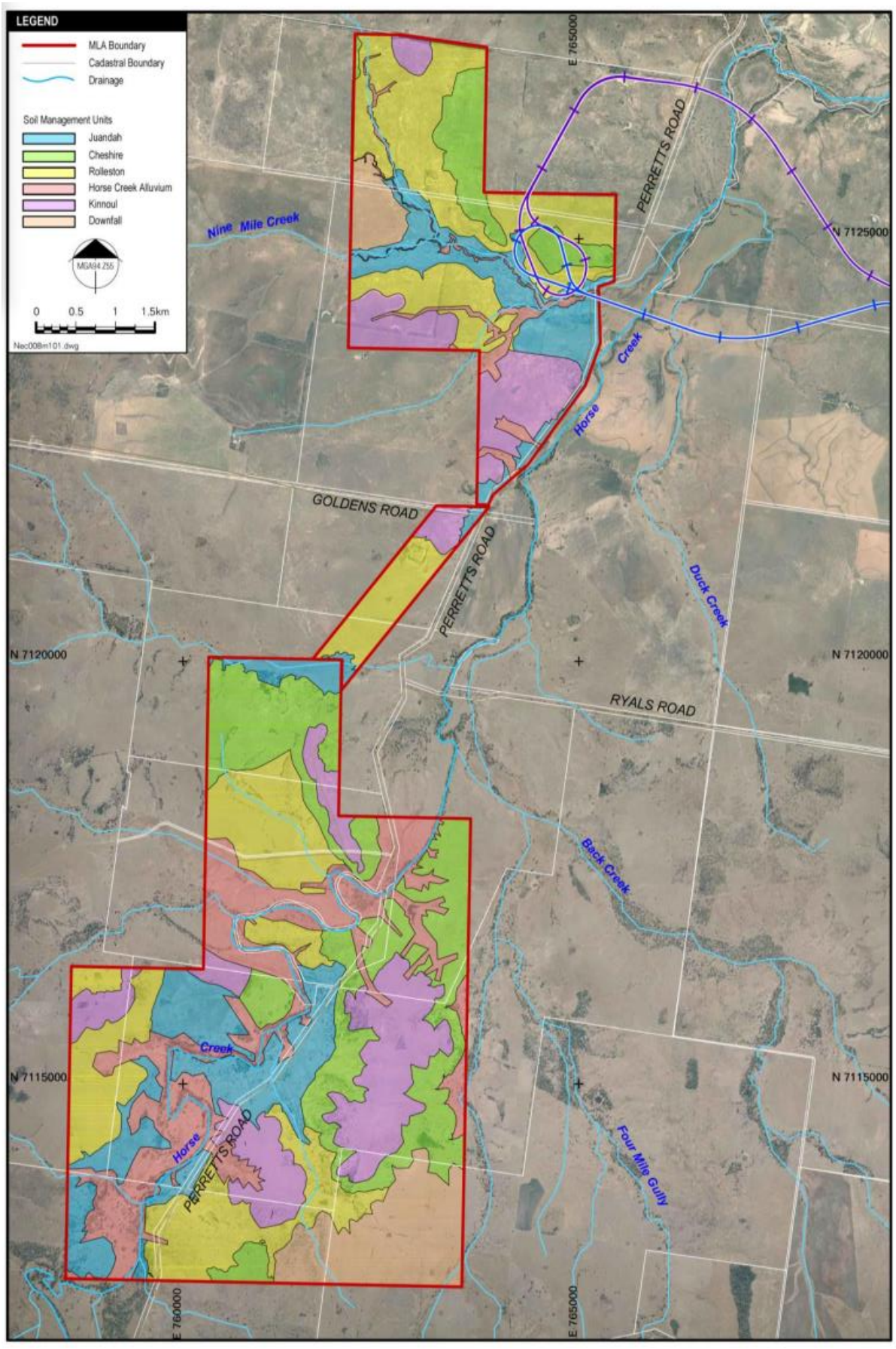

Figure 10: Distribution of Soil Management Units within the Project MLs

3.1.7 Flora and fauna

3.1.7.1 Field surveys

Five terrestrial ecology surveys were undertaken across the three ML areas between 2007 and 2013 for the Project EIS. The findings of these surveys are detailed in the following sub-sections. No recent field surveys of the Project site have been undertaken, however a desktop study was conducted and is also presented throughout the following sub-sections.

3.1.7.2 Wetland habitats

Previous database searches conducted for the EIS (AARC 2014) revealed that no mapped palustrine or lacustrine wetlands occurred within the Project area. However, a palustrine wetland was identified to the east of the southern Project site boundary. Palustrine wetlands can provide nesting sites for birds, roosting sites for bats, food sources for migratory species, and filtration of the water moving through them by removing contaminants and nutrients. These wetlands were targeted for assessment of conservation values during the field surveys. Due to the location of this wetland in relation to the Project, it was targeted in the flora and fauna assessment.

A riverine wetland was identified on the Project site, fringing Horse Creek. The Wetland*Maps* (2019) database describes the wetland area as encompassing the natural channel of the river and the immediate riparian vegetation. This riparian wetland was also targeted as part of the flora and fauna assessment for the Project.

3.1.7.3 Flora

Remnant vegetation

Previous surveys identified eight vegetation communities within the Project Site with a total of 187 flora species identified. At that time, no flora species identified were listed as being of conservation significance and 34 species were introduced. Six of the eight vegetation communities were classed as Remnant Vegetation as defined in the *Queensland Vegetation Management Act 1999*.

The eight vegetation communities include:

- Community 1 – Blue Gum Riparian Woodland (RE 11.3.25);
- Community 2 – Blue Gum Riparian Woodland (with Interspersed Poplar Box) (RE 11.3.25 / 11.3.2);
- Community 3 – Brigalow Open Forest (RE 11.9.5);
- Community 4 – Brigalow Open Forest with Associated Poplar Box (RE 11.9.10);
- Community 5 – Poplar Box and Cypress Pine Open Forest (RE 11.10.11);
- Community 6 – Blue Gum Palustrine Wetland / Poplar Box Woodland in Drainage Depressions (RE 11.3.2 / 11.3.2b);
- Community 7 – Non-Remnant Grassland; and
- Community 8 – Regrowth Vegetation.

As part of PRCP development, a desktop search of version 12.0 Queensland Government Vegetation management regional ecosystem mapping (DES 2022) was conducted to determine current vegetation mapping, listings, and occurrence within the Project site. This search identified six (6) regional ecosystems (REs) within the Project site; as listed in Table 8. One remnant RE has been listed as 'least endangered', two are listed as 'of concern', and three are listed as 'least concern' under the Vegetation Management Regulation and *Vegetation Management Act 1999* (VM Act). The distribution of REs in the vicinity of the Project are shown in Figure 11.

Table 8: Remnant regional ecosystems

Regional ecosystem	Short description	VM class	Biodiversity status
11.9.5	*Acacia harpophylla* and/or *Casuarina cristata* open forest to woodland on fine-grained sedimentary rocks	Endangered	Endangered
11.3.25 / 11.3.2	*Eucalyptus tereticornis* or *E. camaldulensis* woodland fringing drainage lines / *Eucalyptus populnea* woodland on alluvial plains	Least concern / Of concern	Of concern / Of concern
11.10.11	Eucalyptus populnea, E. melanophloia +/- Callitris glaucophylla woodland on coarse-grained sedimentary rocks	Least concern	No concern at present
11.9.10	*Eucalyptus populnea* open forest with a secondary tree layer of *Acacia harpophylla* and sometimes *Casuarina cristata* on fine-grained sedimentary rocks	Of concern	Endangered
11.3.25 / 11.9.7 / 11.9.10	*Eucalyptus tereticornis* or *E. camaldulensis* woodland fringing drainage lines / *Eucalyptus populnea, Eremophila mitchellii* shrubby woodland on fine-grained sedimentary rocks / *Eucalyptus populnea* open forest with a secondary tree layer of *Acacia harpophylla* and sometimes *Casuarina cristata* on fine-grained sedimentary rocks	Least concern / Of concern / Of concern	Of concern / Of concern / Endangered

Given that the watercourse that runs through the southern ML (ML 50254) of the Project area (Horse Creek) is a relevant watercourse or drainage feature as identified on the vegetation management watercourse and drainage feature map, an RE within the defined distance of a defining bank of these watercourses is a Matter of State Environmental Significance (MSES) (regulated vegetation defined watercourse)(Figure 12).

The mapped vegetation across ML 50254 includes REs with a VM Act class of 'endangered' and 'of-concern'. These REs are an MSES and as such, the vegetation within ML 50254 could be an MSES (further vegetation mapping at an appropriate spatial resolution would be required to confirm this).

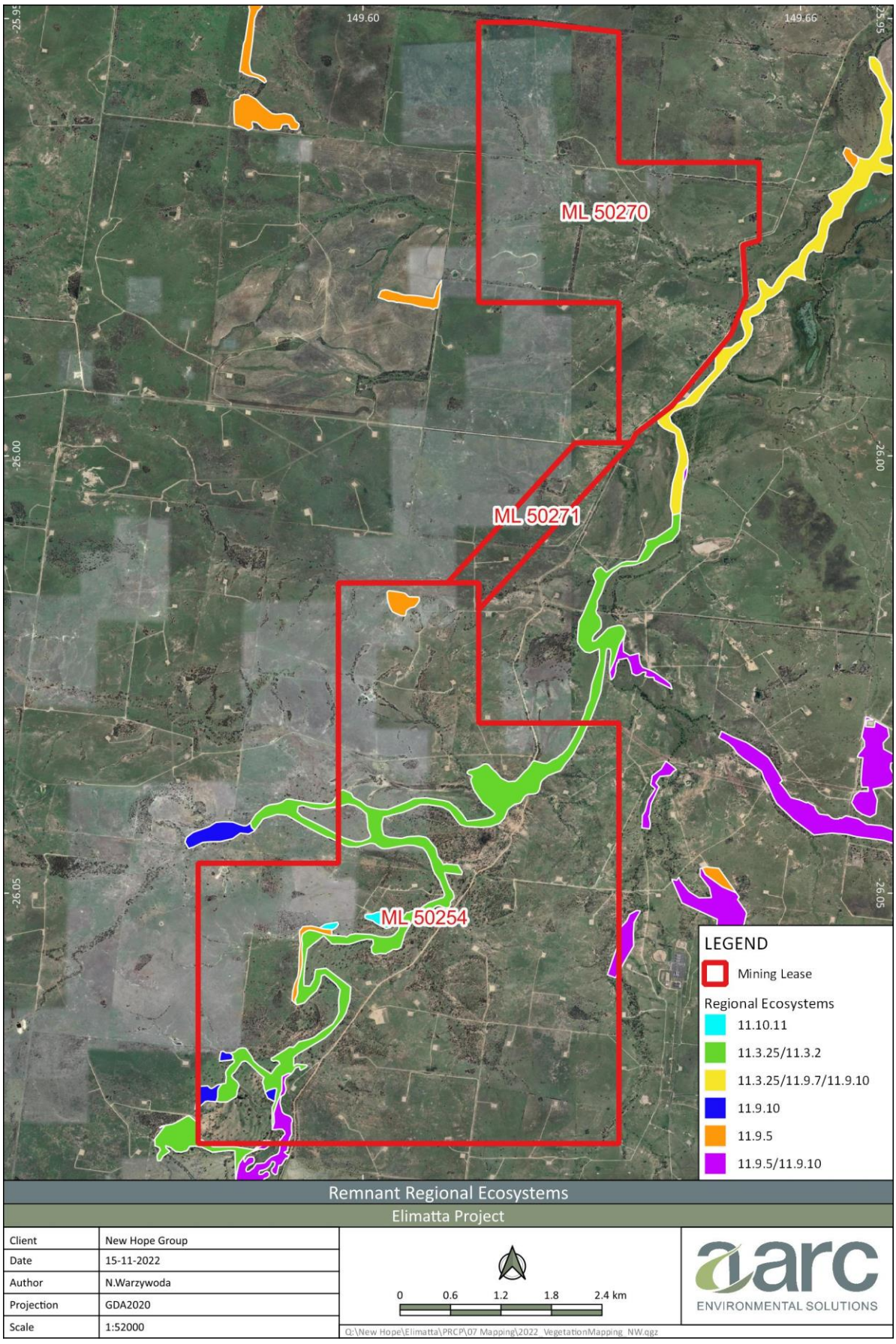

Figure 11: Remnant Regional Ecosystem communities at the Project site (DES 2022)

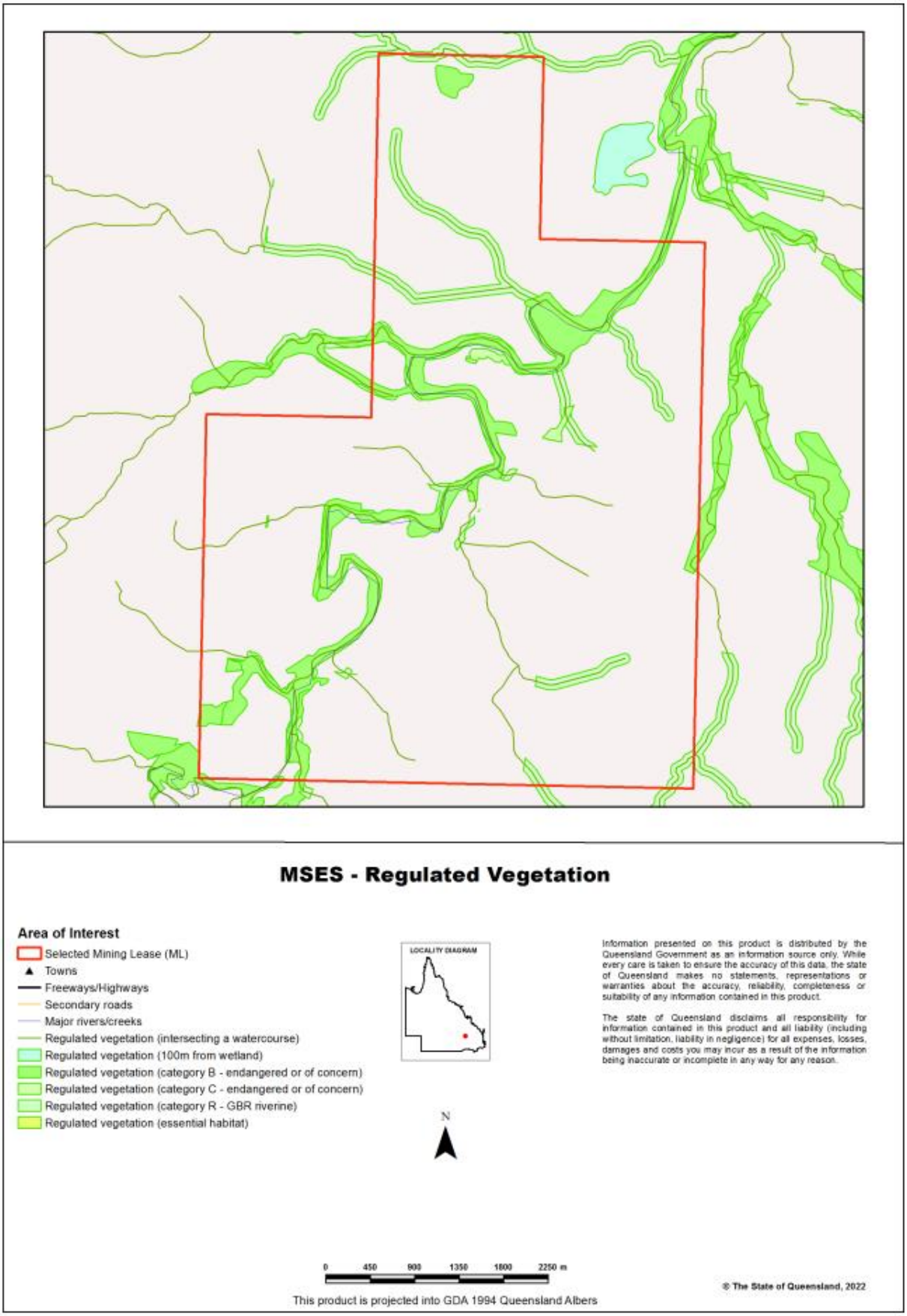

Figure 12: Regulated vegetation mapping

Threatened ecological communities

A number of flora species of conservation significance were identified in the desktop searches for the Project EIS (AARC 2014) as having a moderate potential to occur on the Project site. Targeted searches did not detect any flora species of conservation significance on site. Despite the survey effort employed, there is the potential that threatened flora species could occur in parts of the Project site. As the Project site has been extensively cleared and grazed, it is considered unlikely to provide suitable habitat for most threatened species.

The field surveys undertaken for the EIS (AARC 2014) identified three communities with the potential to be Threatened Ecological Communities (TECs).

- Community 3 (Brigalow open forest) - RE 11.9.5, Brigalow and/or Belah Open Forest is listed as 'Endangered' under the VM Act and the EHP Biodiversity status due to <10% of the community's pre-clearing area remaining in Queensland. This RE is also included within the 'Brigalow (Acacia harpophylla dominant and co-dominant) woodlands' Threatened Ecological Community listed under the EPBC Act.
- Community 4 (Brigalow Open Forest with Associated Poplar Box) - RE 11.9.10, Brigalow Open Forest with associated Poplar Box is 'Of Concern' under the VM Act and 'Endangered' under the EHP Biodiversity status with only 10-30% of the community's pre-clearing area remaining in Queensland. This RE is also included within the 'Brigalow (*Acacia harpophylla* dominant and co-dominant) woodlands' Threatened Ecological Community listed under the EPBC Act.
- Community 8 (regrowth vegetation) - is mapped as High Value Regrowth containing Endangered REs. However, the majority of this community is RE 11.10.11 regrowth, which is 'Least Concern' under the VM Act. Only the two small Brigalow patches are High Value Regrowth containing Endangered REs. Brigalow is also listed as a Threatened Ecological Community under the EPBC Act. The majority of the community is High Value Regrowth that is a Least Concern RE and is not listed under the EPBC Act.

A current desktop search of the Protected Matters Search Tool (with a 10 km buffer applied) identified five ecological communities as occurring or potentially occurring on the Project site. These are listed as Matters of National Environmental Significance (MNES) and include:

- Brigalow (Acacia harpophylla dominant and co-dominant);
- Coolibah - Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions;
- Poplar Box Grassy Woodland on Alluvial Plains;
- Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions; and
- Weeping Myall Woodlands.

3.1.7.4 Fauna

Terrestrial fauna

Previous field surveys identified a combined total of 120 vertebrate fauna species on the ML areas during the dry and wet season surveys, comprising nine amphibians (including one exotic species), 13 reptiles, 26 mammals (including 10 exotic species), and 72 birds.

One mammal species, the Little Pied Bat (*Chalinolobus picatus*), was identified on site during field surveys and was previously listed as Near Threatened under the NC Act. Its listing has now been updated to Least Concern.

Two bird species listed as Marine under the EPBC Act were observed on the Project Site, the Whistling Kite (*Haliastur sphenurus*) and Sacred Kingfisher (*Todiramphus sanctus*). Although common throughout their respective ranges within Australia, they are protected under international agreements incorporated by the EPBC Act.

Eleven introduced fauna species were recorded within the Project site. Of these, seven are declared pest animals under the *Land Protection (Pest and Stock Route Management) Act 2002*. These include the Cane Toad (*Bufo marinus*), House Mouse (*Mus musculus*), Feral Cat (*Felis catus*), Feral Pig (*Sus scrofa*), European Rabbit (*Oryctolagus cuniculus*), European Fox (*Vulpes vulpes*) and Dingo (*Canis familiaris dingo*).

Based on an assessment of the likelihood of species occurring on the site, a further 17 fauna species of conservation significance have the potential to utilise the Project site or surrounding area. Although the species were not identified on the Project site during the seasonal surveys, database searches indicate moderate to high potential that these species could inhabit or utilise the Project in the future.

A current desktop search of the Protected Matters Search Tool (with a 10 km buffer applied) identified 30 listed threatened species, 10 listed migratory species, and 15 listed marine species as occurring or potentially occurring on the Project site.

Aquatic Fauna

The fish species identified during the aquatic study for the Project EIS (AARC 2014) included Spangled Perch (*Leiopotherapon unicolour*), Glass Perch (*Ambassis agassizi*), and Rainbowfish (*Melanotaenia splendida*). No aquatic species of conservation significance were identified within the ML areas.

Stygofauna

Four stygofauna surveys were conducted for the Project EIS. Phase 1 (2009) and phase 2 (2011) surveys identified stygofauna occurring within the ML areas. Additional sampling (Phases 3 and 4) was undertaken in 2012 to investigate the presence of *Bathynellidae sp*. ELIM, *Parastenocaris sp*. ELIM and *Dussartcyclops sp.* ELIM outside the Project's area of influence.

The survey results suggest that the Quaternary alluvial sediments (where saturated) are the primary habitat for stygofauna, although occupation of the sandstone/coal seam aquifer (or bores tapping this aquifer) cannot be precluded.

Following the four rounds of sampling, four obligate groundwater species (stygobites) were identified:

- *Bathynellidae sp*. ELIM (order Syncarida);
- *Dussartcyclops sp*. ELIM (subclass Copepoda);
- *Parastenocaris sp*. ELIM (subclass Copepoda); and
- *Dussartstenocaris sp*. ELIM (subclass Copepoda).

3.2 Community consultation

3.2.1 Previous stakeholder and community engagement activities

Community consultation activities were undertaken for the Project to inform the preparation of the EIS, Social Impact Assessment (SIA) and the development of Stakeholder Management Plans (Appendix D). These consultation activities have provided the opportunity to discuss post mining land use and mine closure activities. Local community members and landholders have indicated they would prefer to see the land rehabilitated to an agricultural land use post-mining.

Although community consultation has not been undertaken since the EIS approvals process completed, a consultation plan has been developed and will be updated and implemented prior to the commencement of the Project and updated thereafter as needed.

The main methods of community engagement undertaken have included:

- conducting face-to-face meetings with directly affected landholders;
- conducting face-to-face meetings with key community leaders and organisations;
- conducting face-to-face meetings with key council and government representatives in Wandoan, Taroom, Dalby and Toowoomba;
- conducting community information sessions;
- preparing and distributing a Project fact sheet;
- distributing a survey to elicit feedback on community issues; and
- producing a 'questions and answers' document to ensure consistency when communicating with stakeholders.

3.2.2 Stakeholder management plan

To meet the requirements of Section 126C(1)(c)(iv) of the EP Act, and the PRCP Guideline, New Hope has developed a stakeholder engagement plan (SEP) that aims to build upon previous engagement activities conducted as part of the EIS (Appendix D). The SEP is intended to act as a framework to guide consultation and ensure stakeholders are provided the opportunity to engage on, among other things, rehabilitation and closure matters relating to the Project.

The SEP will be reviewed prior to the commencement of mining and any Project changes and community consultation will be undertaken where practicable to inform Project changes.

3.2.3 Ongoing consultation

Ongoing consultation will occur at key stages of the Project life and where any significant milestones are reached or changes in Project activities proposed. The following methods will be used to maintain contact with the local community throughout the life of the Project.

- Creating a contact telephone number for inquiries and complaints.
- Communicating with stakeholders throughout the life of the Project via site visits, mine open days, regular meetings of the community discussion group and newsletters.
- Annual sustainability reporting undertaken by independent consultants to gauge the mine's reputation amongst the community and community satisfaction with consultation methods.
- Consulting with the community closer to the closure and decommissioning of the mine concerning requirements for mine closure, potential land uses and post mining monitoring.

Feedback from the consultation process will continue to be entered into the consultation register. The relevant Project team member will review the feedback that has been entered into the consultation register for action and implementation of appropriate mitigation strategies where required. This process will ensure that mitigation strategies are developed for the potential adverse environmental and socioeconomic impacts that have been identified through consultation.

Ongoing monitoring of the local environment is a requirement in the EA conditions for the Project. Results of regular monitoring events will be made available to interested and affected persons if requested.

3.2.4 Community consultation register

A community consultation register was developed for the Project EIS to inform post mining land use outcomes including rehabilitation strategies and will be updated during ongoing consultation with stakeholders (see Appendix E). The consultation register will be used to record ongoing consultation date(s), engaged community member(s), consultation type, information provided, key issues raised, response actions

and/or outcomes and any commitments made by New Hope. All complaints received will also be included in the community consultation register. The community consultation register will also inform ongoing development of the mining activities and will continue to be maintained to document each stakeholder consultation event, including meetings, presentations, feedback, phone calls and written submissions.

3.3 Post-mining land uses

This section of the PRCP describes and discusses the PMLUs proposed for the Project in accordance with section 126C(1)(d) of the EP Act. In accordance with the objectives of the Queensland Government as defined in the *Mined land rehabilitation policy* (Queensland Government 2018), the general rehabilitation goals for the Project are to leave the area safe, stable, not causing environmental harm and able to sustain an agreed PMLU.

The further site-specific goals for the Project include:

- minimising the loss of pre-existing agricultural land value by reinstating, where possible, grazing lands at a similar suitability to that existing prior to mining;
- where this cannot be achieved, identifying alternative uses that provide a similar value to the value able to be generated from the land prior to mining or an alternative land use, or uses, able to provide long-term ecological value to the region; and
- minimising or avoiding the potential for post-mining lands having no or little value to the area or region.

Rehabilitation of disturbed areas will aim to reinstate land to a condition as similar as possible to the pre-mining landscape. For a majority of the Project area, the proposed post-mining land use and condition will be consistent with the current primary land use of low intensity cattle grazing. Riparian habitats will be established along the length of the Horse Creek Diversion consistent with the rehabilitation outcomes proposed for the diversion.

3.3.1 Planning scheme conformance

The Western Downs Regional Council Planning Scheme (2019) identifies the Project area as being within the Rural Zone with a defined purpose to:

a) provide for rural uses and activities;

b) provide for other uses and activities that are compatible with:

   i) existing and future rural uses and activities, and

   ii) the character and environmental features of the zone; and

c) maintain the capacity of the land for rural uses and activities by protecting and managing significant natural resources and processes.

The Rural Zone accommodates a range of rural uses, including agriculture, and the Scheme encourages the retention and enhancement of natural features and protection of scenic landscape values.

3.3.2 Land suitability

The Soil and Land Suitability Assessment (AARC 2013) (Appendix G) conducted for the EIS evaluated the suitability of the Project area, prior to mine development, for the land uses of beef cattle grazing and rainfed broadacre cropping. An interpretation of the data collected on the physical, chemical and nutritional characteristics of the soils was made to rank the land according to the five-class land suitability system provided in the *Technical Guidelines for the Environmental Management of Exploration and Mining in Queensland – Land Suitability Assessment Techniques* (DME 1995). The classes are described as follows.

Class 1 Suitable land with negligible limitations which is well suited to a proposed use.

Class 2 Suitable land with minor limitations which is suited to a proposed use but which may require minor changes in management to sustain use.

Class 3 Suitable land with moderate limitations which is moderately suited to a proposed use but which requires significant inputs to ensure sustainable use.

Class 4 Marginal land with severe limitations which is marginally suited for a proposed use and would require major inputs to ensure sustainability. These inputs may not be justified by the benefits to be obtained in using the land for a particular purpose and is hence considered presently unsuitable.

Class 5 Unsuitable land with extreme limitations which preclude its sustainable use for the proposed purpose.

A summary of the outcomes of the land suitability assessment is provided in Table 9. Pre-mining land suitability mapping is provided in the Soil and Land Suitability Assessment (AARC 2013); refer Appendix G.

The outcomes of the Land Suitability Assessment were also compared with the distribution of land classified as 'Good Quality Agricultural Land' (GQAL) in the DERM (2010) Land Classification System, in accordance with the Planning Guideline –The Identification of Good Quality Agricultural Land (the Planning Guideline) (DHLGP 1993). The classification of GQAL provides an indication of the quality of the land resource to maintain a sustainable level of productivity for a given land use. The Planning Guideline defines GQAL as follows.

Class A Crop land: Land that is most suitable for current and potential crops with limitations to production which range from none to moderate levels.

Class B Limited crop land: Land that is marginal for current and potential crops due to severe limitations; and suitable for pastures. Engineering and/or agronomic improvements may be required before the land is considered suitable for cropping.

Class C Pasture land: Land that is suitable only for improved (Class C1) or native pastures (Class C2) due to limitations which preclude continuous cultivation for crop production; but some areas may tolerate a short period of ground disturbance for pasture establishment. This also includes land suitable for light grazing of native pastures in inaccessible areas (Class C3)

Class D Non-agricultural land: Land not suitable for agricultural uses due to extreme limitations. This may be undisturbed land with significant habitat, conservation and/or catchment values or land that may be unsuitable because of very steep slopes, shallow soils, rock outcrop or poor drainage.

A summary of the outcomes of the GQAL assessment is provided in Table 9. GQAL mapping for the Project is provided in the Soil and Land Suitability Assessment (AARC 2013); refer Appendix G.

Table 9: Land suitability and good quality agricultural land assessment outcomes

Soil management unit	**Important limitations**	**Land suitability assessment outcomes**		**Agricultural land quality assessment outcomes**
		Beef cattle grazing	Broadacre cropping	
Downfall	Temporal flooding of gilgai, nutrient deficiency and PAWC deficiencies.	3	4	C1

Soil management unit	Important limitations	Land suitability assessment outcomes		Agricultural land quality assessment outcomes
		Beef cattle grazing	Broadacre cropping	
Kinnoul	Erosion potential and PAWC deficiencies.	3	4	C1
Cheshire	PAWC deficiencies, nutrient deficiency and Erosion potential.	3	4	A1
Rolleston	Erosion potential and nutrient deficiency.	3	4	A1
Juandah	PAWC deficiencies, nutrient deficiency Flooding potential and Wetness issues.	4	5	B2
Horse Creek alluvium	PAWC deficiencies, Flooding potential, poor topography and Wetness issues.	3	5	B2

3.3.3 Land outcome documents

In 2014, the Project EIS was submitted to DES for the application and approval of mining activities across MLs 50270, 50271 and 50254. The EIS Volume 3 (Chapter 3 – Environmental values, impacts, control strategies and proposed EA conditions) details proposed EA conditions for the final land use and rehabilitation approval schedule which has been detailed in Table 10. The subsequent EIS assessment report (EHP 2014) replicated the proposed EA conditions presented in the Project EIS. However, the PMLU for the 'Waste Disposal' domain was presented as 'to be advised' or 'TBA'. The Landform Design (Schedule H – Table H2) of the EIS assessment report was also partially filled with 'TBA' in the Slope (Ratio) column for both the TSFs (Walls) and Spoil Dumps.

Following this, the approved EA detailed PMLUs in Schedule H -Table 1 (Rehabilitation Requirements) and listed all rehabilitation requirements as 'TBA'. Table H2 (Landform Design) was not incorporated into the EA. The current EA requires that Table H1 (Rehabilitation Requirements) be populated and submitted to the administering authority 'prior to commencement of mine construction activities'. For this PRCP, Table 10 has been populated with information from all three LODs in accordance with the order as outlined in Part 27, Schedule 750 of the EP Act.

In accordance with Schedule H – Condition H1 of the EA, Table 5.67 (Final Land Use and Rehabilitation Approval Schedule) of the EIS, and the EIS Assessment Report (EHP 2014), all areas disturbed by mining activities must be rehabilitated in accordance with:

- Schedule H – Table 1 of the EA which has been populated with information from the EIS Assessment report and the waste disposal PMLUs determined from the Project EIS (Table 10); and
- Schedule H – Table 2 of the EIS Assessment report which nominates maximum slopes for both the TSFs (walls) and spoil dumps determined from the Project EIS (Table 11).

It should be noted that the while the WSL rail and services corridor is to be developed as part of the Project, it was accepted by the EIS Assessment Report that this should not be considered as infrastructure subject to decommissioning and rehabilitation. Therefore, the WSL is not considered to be a component of this PRCP.

Table 10: Final land use and rehabilitation approval schedule

Domain	Mine areas included	Total area (ha)	Location	Pre-mining		Post-mining	
				Land use	Suitability class	Land use	Suitability class
Residual void	Residual voids	230	ML 50254	Low intensity cattle grazing	3 – 4	Unsuitable	5
	In-pit TSF (TDP)	150	ML 50254	Low intensity cattle grazing	3 – 4	Unsuitable	5
Exploration	Exploration areas	50	ML 50254	Low intensity cattle grazing	3 – 4	Low intensity cattle grazing	3 – 4
Dams	Environmental dam – EV1	2	ML 50254	Low intensity cattle grazing	4	Low intensity cattle grazing	4
	Environmental dam – EV2	10	ML 50254	Low intensity cattle grazing	3	Low intensity cattle grazing	3 – 4
	Environmental dam – EV3	4	ML 50254	Low intensity cattle grazing	3 – 4	Low intensity cattle grazing	3 – 4
	Environmental dam – EV4	15	ML 50270	Low intensity cattle grazing	3 – 4	Low intensity cattle grazing	3 – 4
	Sediment dam – SD1	5	ML 50254	Low intensity cattle grazing	3	Low intensity cattle grazing	3
	Sediment dam – SD2	5	ML 50254	Low intensity cattle grazing	3 – 4	Low intensity cattle grazing	3 – 4
	Sediment dam – SD3	6	ML 50254	Low intensity cattle grazing	3 – 4	Low intensity cattle grazing	3 – 4
	Raw water dam – RW1	10	ML 50270	Low intensity cattle grazing	3 – 4	Low intensity cattle grazing	3 – 4
Diversion	Horse Creek diversion	160	ML 50254	Low intensity cattle grazing	3 – 4	Low intensity cattle grazing	3 – 4
Infrastructure	Workshop and offices	35	ML 50254	Low intensity cattle grazing	3 – 4	Low intensity cattle grazing	3 – 4
	Chemical / fuel storages						
	Sewage treatment						
	Plant						
	CHPP						

Domain	Mine areas included	Total area (ha)	Location	Pre-mining		Post-mining	
				Land use	Suitability class	Land use	Suitability class
	Light vehicle access roads	15	ML 50254, ML 50270, ML 50271	Low intensity cattle grazing	3 – 4	Low intensity cattle grazing	3 – 4
	Rail loadout facility	2	ML 50270	Low intensity cattle grazing	3 – 4	Low intensity cattle grazing	3 – 4
	Haul roads	40	ML 50254, ML 50270, ML 50271	Low intensity cattle grazing	3 – 4	Low intensity cattle grazing	3 – 4
	Mining village	10	ML 50270	Low intensity cattle grazing	3 – 4	Low intensity cattle grazing	3 – 4
	Rail and services corridor and rail balloon loop*	216	ML 50270	Low intensity cattle grazing	3	N/A**	N/A**
	Conveyor trace	1	ML 50270	Low intensity cattle grazing	3 – 4	Low intensity cattle grazing	3 – 4
	Topsoil stockpiles	20	ML 50254	Low intensity cattle grazing	3 – 4	Low intensity cattle grazing	3 – 4
Waste disposal	In-pit spoil dumps	1820	ML 50254	Low intensity cattle grazing	3 – 4	Low intensity cattle grazing	3 – 4
	Out-of-pit spoil dumps	200	ML 50254	Low intensity cattle grazing	3 – 4	Low intensity cattle grazing	3 – 4
	Surface tailings Storage facility (TDN and TDNA)	317	ML 50270	Low intensity cattle grazing	3 – 4	Low intensity cattle grazing	3 – 4

* Assumed maximum disturbance width of 60m within 100m corridor

** Assumed that the rail and services corridor infrastructure will be retained post decommissioning of the Project as it will continue to offer a significant benefit to resource developers, other land users and the general public.

Table 11: Landform design parameters (Schedule H – Table H2)

Disturbance type		Slope (Ratio)
Residual voids	Void wall Competent rock Maximum slope	1V : 0.5H
	Void wall Incompetent rock Maximum slope	1V : 1H
Surface tailings Storage facilities (TDN and TDNA)	Top	1V : 100H
	Walls	1V : 3H
Spoil dumps		1V : 6H

3.4 Non-use management areas

A NUMA is an area of land that cannot be rehabilitated to a stable condition after all rehabilitation activities have been carried out (DES 2021).

3.4.1 Land outcome documents

The residual voids on the western and eastern side of ML 50254 are described as NUMAs within both the Project EIS and the EIS assessment report. This is reflected in condition H6 of the EA which states:

> ***Condition H6 Residual void Outcome***
>
> *Residual voids must not cause any serious environmental harm to land, surface waters or any recognised groundwater aquifer, other than the environmental harm constituted by the existence of the residual void itself and subject to any other condition within this environmental authority.*

While condition H1 specifies that all landforms significantly disturbed by mining be rehabilitated, condition H6 identifies residual voids as having a separate post mining outcome. The outcome determined for the residual voids within the EA is '*must not cause any serious environmental harm*'. Given the voids have been determined as unsuitable for a PMLU within the Project EIS and EIS assessment report (Table 10), the residual voids have been determined to be NUMAs.

The relevant land outcome documents applicable to this PRCP are:

- the Project EA;
- the EIS assessment report (EHP 2014).

The existence of LODs outlining the location of NUMAs for the Project results in objective assessments not being required to be undertaken for the PRCP in accordance with section 213, Schedule 8A, Part 3, Table 1 (Final site design assessment) and Table 3 (Non-use management area assessment) of the EP Regulation. This outcome is also in accordance with section 754(3) of the EP Act, where the designation of the residual voids as NUMAs has been identified within LODs and is therefore not required to comply with section 126C(1)(g) or (h) or 126D(2) or (3) for the proposed PRCP schedule.

In relation to the *Progressive Improvement* component of Table 3, this PRCP will:

- describe how non-use areas will undergo improvement to a safe and stable condition post-closure;
- illustrate how improvement will commence at the Project;
- identify risks and discuss their incorporation within the improvement schedule; and
- detail the timeframe for Improvement Areas (IAs) to progress through management milestones.

The combination of the EA, EIS assessment report and EIS provide for a transition of pre-approved NUMAs into this PRCP. The EIS and EIS assessment reports are key documents that identify the location of all the Project's NUMAs. In accordance with Table 5.67 (Final Land Use and Rehabilitation Approval Schedule) of the Project EIS and the EIS Assessment Report, all areas disturbed by mining activities must be rehabilitated in accordance with:

- Schedule H – Table 1 of the EIS Assessment report with the Waste Disposal PMLUs determined from the EIS (Table 10); and
- Schedule H – Table 2 of the EIS Assessment report with the Slope (Ratio) for both the TSFs (Walls) and Spoil Dumps determined from the EIS (Table 11).

3.4.2 Proposed non-use management areas

As per the EIS Assessment Report (EHP 2014), the residual voids have been nominated as NUMAs (Table 10 and Figure 18).

Modelling suggests that the TDP will become almost completely filled with tailings by the end of the mine life and could be covered with a soil cover for rehabilitation. This is the preferred outcome for the TDP. However, if the tailings fill occurs to a level lower than the surrounding ground level, it is possible that TDP will subsequently become a residual void in which case it will be managed as a NUMA.

Both the location and size of the residual voids as described in the land outcome documents are consistent with the NUMAs proposed for this PRCP (refer Figure 17 and Figure 18). Design parameters for the NUMAs are presented in Table 12.

Table 12: Residual void design

Void name	**Coordinates (GDA 2020 MGA zone 55)**		**Void wall – competent rock max slope**	**Void wall – incompetent rock max slope**	**Approximate depth (AHD)**	**Void maximum surface area (ha)**
	Easting	Northing				
Eastern void	149.63	-26.08	1V : 0.5H	1V : 1H	190	230
Western void	149.59	-26.07	1V : 0.5H	1V : 1H	185	

3.5 Rehabilitation management methodology

3.5.1 Rehabilitation objectives

In Queensland, mine rehabilitation is required under the EP Act. Amendments to the EP Act in late 2018 implemented key elements of the State Government's Mined Land Rehabilitation Policy (Queensland Government 2018) which intends to ensure that, for land disturbed by mining activities:

- the land is safe and structurally stable;

- there is no environmental harm being caused by anything on or in the land; and
- the land can sustain a post-mining land use (section 111A of the EP Act).

These three objectives are the general rehabilitation goals for all areas disturbed by mining in Queensland. For the Project, the rehabilitation goals and objectives can be summarised as follows:

- Long term safety:
  - the site is safe for humans and animals now and in the foreseeable future.
- Stable:
  - Landform design and vegetation cover to minimise erosion; and
  - landforms certified as geotechnically stable.
- Sustainable land use:
  - soil properties that support and will continue to support the nominated PMLUs; and
  - establishment of the specified PMLUs.
- Non-polluting:
  - any hazardous materials appropriately managed.

3.5.2 Rehabilitation areas and improvement areas

To allow the development of a PRCP schedule that satisfies the requirements of the PRCP Guideline, discrete rehabilitation areas (RAs) and IAs have been defined for the Project. As defined within the EP Regulation 2019:

- an RA is an area of land in the PMLU to which a rehabilitation milestone for the post-mining use relates; and
- an IA is an area of land in the non-use management area to which a management milestone relates.

RAs and IAs have been nominated for the various areas of disturbance associated with the Project considering both the type of disturbance type and the proposed PMLUs as per Table 13 and shown in Figure 13 and Figure 14.

Table 13: Nominated rehabilitation and improvement areas

Rehabilitation Area reference	Mining domain	Description	PMLU
RA1	Creek diversion	Horse Creek diversion (permanent)	Low intensity cattle grazing (native riparian vegetation)
RA2a	Water management infrastructure	• Environmental dams • Sediment dams • Raw water dams	Low intensity cattle grazing (modified pasture)
RA2b		• Retained flood levee	

Rehabilitation Area reference	Mining domain	Description	PMLU
RA3	Mine infrastructure areas	• Buildings, including foundations • Roads • Chemical/fuel storages • CHPP • Laydown yard • Access/coal haul road and infrastructure corridor • infrastructure corridor linking the MIA to the electrical substation • Pit access road	
RA4	Waste disposal	• Surface TSFs (TDN and TDNA) • In-pit TSF	
RA5	In-pit and out-of-pit spoil dumps	• Out-of-pit waste rock emplacements • In-pit waste rock emplacements	
RA6	Rail and services corridor	• Rail and services corridor and rail balloon loop	Retained infrastructure
IA1	Residual voids	• Residual voids (eastern and western voids)	Unsuitable

3.5.2.1 Changes to total surface area disturbance

The EIS assessment report identified the maximum area proposed to be disturbed across all MLs as 3,313 ha. A review of the disturbance areas (ha) listed for the mining domains allocated for the Project (Table 10) results in a relevant total disturbance of 3,057 ha when the disturbance associated with the rail and services corridor (not included within this PRCP), exploration areas (overlapped by mining disturbance) and the retained flood levee (already included within the water management domain) are excluded (refer Table 14).

The designation of RAs and re-creation of a spatial data set for the development of this PRCP has resulted in some differences to the equivalent areas nominated in the EIS Assessment report. The re-assessment has resulted in the disturbance areas (in ha) listed for the mining domains within Table 10, now being a total of 2,912 ha; a difference of 142 ha to the relevant disturbance area stated in the EIS Assessment report.

It was identified that several water management structures (i.e. dams) that are within the EIS assessment report, and not considered to be within other disturbance areas or RAs as shown in Figure 14, were not included within Table 10 (Section 3.3.3). Several dams have been added to the total disturbance area to include a total of two raw waters dams, four environmental dams, and seven sediment dams. The total disturbance area for the dams has been determined as 46 ha, which was calculated to be 11 ha less than previously determined.

The areas shown in Table 14 will be used for the PRCP schedule for the RAs shown.

Table 14: Total rehabilitation areas

Rehabilitation Area reference	Mining domain	EIS Assessment report total areas (ha)	Current mapping total areas (ha)	Difference (ha)
RA1	Creek diversion	160	143	-17

Rehabilitation Area reference	Mining domain	EIS Assessment report total areas (ha)	Current mapping total areas (ha)	Difference (ha)
RA2a	Water management infrastructure	57	46	-11
RA2b[1]		N/A	7	7
RA3	Mine infrastructure areas	123	132	9
RA4	Waste disposal	467	416	-51
RA5	In-pit and out-of-pit spoil dumps	2,020	1,925	-95
RA6[2]	Rail and services corridor	216	28	-188
IA1	Residual voids	230	218	-12
Exploration[3]	Exploration areas	50	N/A	-
	TOTAL	**3,057[4]**	**2,912[5]**	**-142**

1 Retained flood levee is not included within the original Table 10 outlining the areas for each mine domain. It has been included within the total disturbance for Water Management Structures and compared with previous areas.

2 The total area encompassed in the EIS assessment report includes the total rail corridor. For the Purposes of the PRCP only the section overlapping the ML is included as an RA.

3 Not included within the PRCP as these areas are all incorporated within the total disturbance of the other RAs, therefore has not been included within the calculated total disturbance.

4 The total area calculated from the EIS assessment has not included the Rail and Services Corridor as this domain is to be retained post closure. The Exploration areas have also not been included as they are incorporated into other rehabilitation areas.

5 The total area calculated based on mapping for the site excluding Exploration areas but including the Rail and services corridor areas overlapping the northern ML.

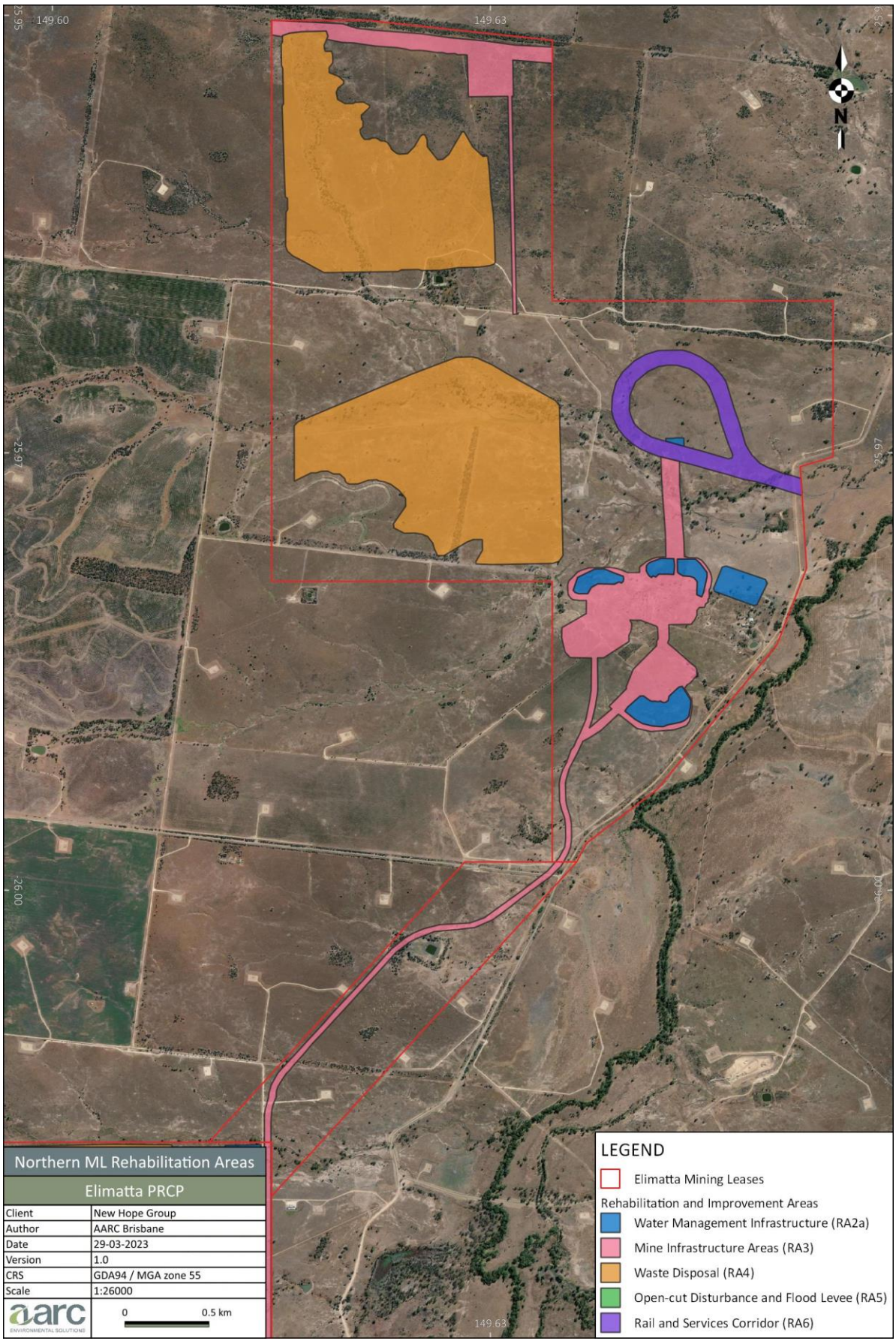

Figure 13: Northern MLs rehabilitation areas – MLs 50270 & 50271

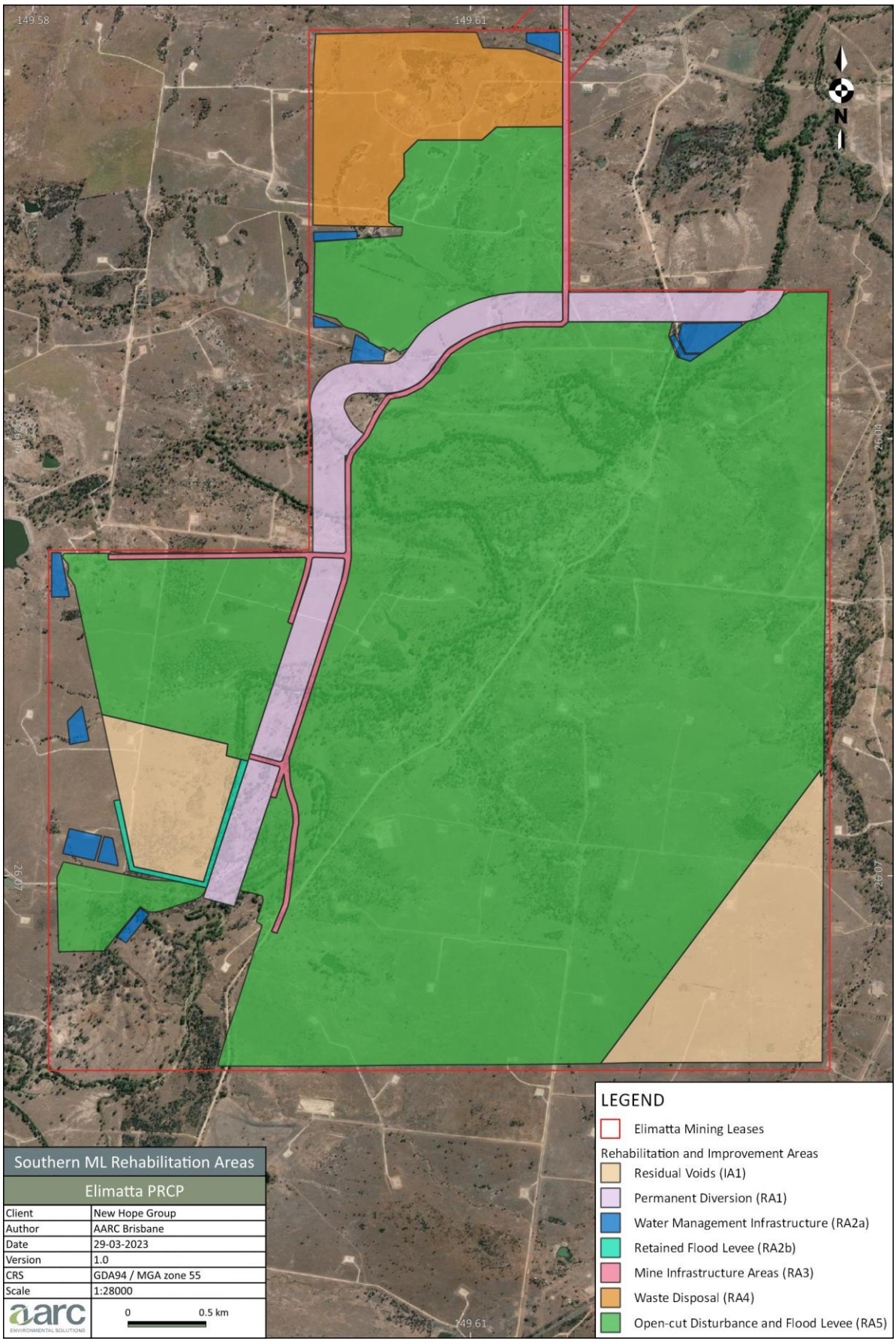

Figure 14: Southern ML rehabilitation areas – ML 50254

3.5.3 Rehabilitation milestones, indicators and milestone criteria

Rehabilitation milestones are defined as each significant event or step necessary to rehabilitate an area of land to a stable condition (Section 112, EP Act). They generally constitute the completion of a discrete activity, being one of a sequence of activities, required to complete rehabilitation of an RA.

Key to assessing the success of rehabilitation is the definition of milestone criteria. Milestone criteria must be consistent with the SMART (specific, measurable, achievable, realistic and timely) principles. They should:

- be outcome-based (i.e. linked to the end land use);
- be flexible to adapt to changing circumstances;
- be able to evolve as the mine life progresses;
- include metrics (rehabilitation indicators) suitable to demonstrate that rehabilitation is trending positively;
- undergo periodic review; and
- include a measurement approach that details how the criterion will have been met (CoA 2016, ANZMEC and MCA 2000).

Rehabilitation indicators and final completion criteria were originally nominated as part of the development of the Project EIS to provide measures and standards of achievement to be able to assess and determine rehabilitation success and completion. The rehabilitation indicators and completion criteria proposed as part of the Project EIS were not included within the EIS assessment report (EHP 2014) or the current EA; but provide a useful basis for development of milestone criteria. The EA does include an applicable table (Table H1 – Rehabilitation Requirements) but with all content marked as ‘to be advised’.

The original EIS completion criteria have been reviewed and, where applicable, proposed as milestone criteria for this PRCP to provide a clear definition of milestone completion and successful rehabilitation for each rehabilitation area. The nominated rehabilitation milestones considered relevant to the Project are outlined Table 15. It should be noted that not all rehabilitation milestones are applicable to all RAs; the applicability of rehabilitation milestones to the various RAs is also indicated in Table 15.

Data relevant to assessing performance against the completion criteria will be collected as part of the rehabilitation monitoring program (see section 3.7). The individual RAs of the Project will be deemed to be successfully rehabilitated when all of the milestone criteria have been met for each milestone.

Table 15: Rehabilitation milestone criteria

Milestone reference	Rehabilitation milestone	Applicable RAs	Milestone criteria
RM1	Infrastructure decommissioning and removal	All RAs	• All non-required services disconnected and removed • All concrete, bitumen and gravel roads removed (where not to be retained) • All non-required operational pipelines drained and removed • All fencing that is not part of PMLU requirements removed • All non-required buildings and footings demolished and/or removed off-site • All machinery and equipment removed • All surface water drainage infrastructure that is not retained in the final landform removed • All rubbish removed
RM2	Management of contaminated land status	RA2a, RA3, RA4, RA5, RA6	• Contaminated material either remediated *in situ* or removed/transported to an approved landfill for disposal and waste tracking information recorded and submitted • Contaminated land assessment undertaken by an appropriately qualified person[1]. If required, a site investigation report including a site suitability statement prepared and submitted in accordance with the provisions of Chapter 7, Part 8 of the EP Act
RM3	Landform development (re-profiling / re shaping) of land affected by disturbance	RA1, RA2a, RA2b, RA3, RA4, RA5	• All earthworks and landform reshaping /re-profiling works completed to design specifications • Geotechnical assessment by an appropriately qualified person[1] confirms that long-term geotechnical stability has been achieved • Certification provided by an appropriately qualified person[1] confirms that drainage features are constructed to design specifications Landform constructed to the following design parameters, where relevant: • Waste rock emplacement: o slopes ≤10° (17%) o uninterrupted batter length ≤70 m o stable berms or bunds (≥5 m wide) • Flood levee slopes ≤10° (17%) • Diversions: o average grade of 0.00158 m/m o valley length of 7.25 km and stream length of 8.25 km o stream sinuosity of approximately 1.12

Milestone reference	Rehabilitation milestone	Applicable RAs	Milestone criteria
RM4	Capping	RA4	• All earthworks and landform reshaping /re-profiling works completed to design specifications • Certification provided by an appropriately qualified person[1] confirms that drainage features are constructed to design specifications • Groundwater monitoring program confirms no migration of contaminants • Geotechnical assessment by an appropriately qualified person[1] confirms that long-term geotechnical stability has been achieved • Landform constructed to design parameters including: o outer slope angles in the order of 1(V) in 3(H) (18°) o cover placement over the tailings (2 m) o placement of non-sodic cover materials (50 mm) o topsoil (250 - 300 mm)
RM5	Surface preparation (topdressing, contour ripping, soil amelioration)	RA1, RA2a, RA2b, RA3, RA4, RA5	• Prior to each rehabilitation event, soil health and suitability are assessed and documented by an appropriately qualified person[1], and a recommendation made for ameliorants to ensure sodicity, salinity, pH and fertility levels are suitable to achieve the relevant PMLU • Records of ameliorants applied and incorporated into surface, as recommended by an appropriately qualified person[1] • Records of topsoil origin and placement of a target depth of 250 - 300 mm • Ripping undertaken along the contour of slopes
RM6	Revegetation (seeding and / or planting) – grazing	RA2a, RA2b, RA3, RA4	• Records demonstrate seeding of target species and/or planting of tube stock (where relevant) specified in: o *Table 25: Current indicative species and sowing rates for low intensity grazing PMLU;* and o *Table 26: Current indicative species and sowing rates; shade trees in a low intensity grazing PMLU*
RM7	Revegetation (seeding and / or planting) – Native (riparian) vegetation	RA1	• Records demonstrate seeding of target species and/or planting of tube stock (where relevant) specified in: o *Table 27: Current indicative species and sowing rates for native riparian habitat PMLU*

Milestone reference	Rehabilitation milestone	Applicable RAs	Milestone criteria
RM8	Achievement of grazing PMLU to stable condition	RA2a, RA2b, RA3, RA4, RA5	• No prohibited invasive or restricted invasive plants, and weed cover is ≤5% (excluding exotic pasture grasses). Weed abundance is no greater than at representative analogue sites • Target percentage vegetation ground foliage cover of ≥50th percentile of that of representative analogue sites with similar landform parameters • Land capability assessment undertaken by an appropriately qualified person[1] confirms that land has achieved a minimum class 4 • Erosion classification[3] is comparable with erosion classifications[3] from nearby equivalent land uses with similar landform parameters, determined using analogue sites established in accordance with section 3.7 (Monitoring and Maintenance) • No active erosion present as demonstrated by no increase in erosion ratings over time • Hazard and safety assessment completed by an appropriately qualified person[1] demonstrates hazards are consistent with the type and severity of hazards typical of the adjacent equivalent land use
RM9	Achievement of native vegetation PMLU to stable condition	RA1	• Downstream water quality complies with water quality objectives or upstream / reference data • No erosion classified[3] as 'severe' nor 'extreme' gully erosion or washout features • No active erosion present as demonstrated by no increase in erosion ratings over time • Assessed as geotechnically stable by an appropriately qualified person[1] • No prohibited invasive or restricted invasive plants, and weed cover is ≤5% (excluding exotic pasture grasses). Weed abundance is no greater than at representative analogue sites o Hazard and safety assessment completed by an appropriately qualified person[1] demonstrates hazards are consistent with the type and severity of hazards typical of the adjacent equivalent land use
RM10	Achievement of target pasture productivity criteria for grazing PMLU	RA2a, RA2b, RA3, RA4	• Pasture productivity is consistently[2] similar to or exceeding analogue sites • Vegetation structure and condition is consistent[2] with analogue sites

Milestone reference	Rehabilitation milestone	Applicable RAs	Milestone criteria
RM11	Achievement of native vegetation PMLU to a sustainable condition	RA1	• Evidence of native fauna utilisation in the form of tracks, scats, and opportunistic observations • Land capability assessment undertaken by an appropriately qualified person[1] confirms that land has achieved a minimum class 4 • Evidence of flora recruitment from rehabilitation monitoring data • Vegetation structure and condition is consistently[2] similar to or exceeding analogue sites • Field-based monitoring data provided in the final rehabilitation report demonstrates that the following attributes are comparable or greater than representative analogue sites: o species richness of tree, shrub and groundcover functional groups; o tree canopy cover; o shrub canopy cover; and ○ perennial grass cover
RM12	Achievement of retained infrastructure PMLU to stable condition	RA6	• Hazard and Safety Assessment completed by an appropriately qualified person[1] demonstrates hazards in RAs are consistent with the type and severity of hazards typical of neighbouring equivalent land use. Remaining hazards are considered to be low risk with no significant increase in risk expected over time • Final landform survey confirms no built structures remain other than those that form part of a landholder agreement • No erosion classified[3] as 'severe' nor 'extreme' gully erosion or washout features • No active erosion present as demonstrated by no increase in erosion ratings over time

1. Appropriately qualified person means a person who has professional qualifications, training, skills or experience relevant to the nominated subject matter and can give authoritative assessment, advice and analysis on performance relating to the subject matter using the relevant protocols, standards, methods, or literature.
2. Consistently means that the criterion is met for a minimum of three consecutive years.
3. Erosion classification framework:

Erosion classification	Minor	Moderate	Severe
Sheet erosion	Shallow soil deposits downslope	Partial exposure of roots; moderate soil deposits downslope, etc.	Loss of surface horizons; root exposure, etc.
Rill/gully erosion	<15 rills and <0.3 m deep	15 – 30 rills and <0.3 m deep	>30 rills and/or any >0.3 m deep
Tunnel erosion	-	-	Present
Mass movement	-	-	Present

3.5.4 Rehabilitation timeframes

Rehabilitation milestones are required to be achieved as soon as practicable after land becomes available for rehabilitation. Land is considered to become available for rehabilitation at the completion of mining, except where land is being used for operating infrastructure or topsoil stockpiles or is identified as being retained infrastructure post-closure. From the scheduling work completed for the Project EIS, the period following the commencement of mining that a given RA would become available was identified and is provided in Table 16.

Rehabilitation milestone timeframes have been developed with consideration for the size of the rehabilitation area, the activities applicable to the milestone and interim rehabilitation activities that are scheduled to occur or anticipated to be required prior to the area becoming available for rehabilitation. Milestones that involve revegetation activities, including monitoring of revegetation, make provision for unfavourable growing seasons and unforeseen extreme events such as droughts or storms that could negatively impact vegetation establishment; requiring longer timeframes for the milestone to be achieved. The nominated rehabilitation timeframes considered for scheduling the rehabilitation milestones are shown in Table 17.

New Hope has not as yet identified a commencement date for the Project. Therefore, it is not possible to nominate any definitive milestone completion dates for use within a PRCP schedule. For this reason, the time frames provided in Table 16 and * commencement is defined as the date when topsoil stripping occurs at the Project

Table 17 are based on either durations (in years) from the commencement of mining or durations between milestones. For clarity, the commencement date has been defined as the date of commencement of disturbance (topsoil stripping) within the pit area (i.e. the start of the mining phase). The PRCP schedule would be required to have a commencement date inserted through an amendment once this was known with the Project unable to be commenced prior to this.

Table 16: Land availability timing for rehabilitation

Rehabilitation area		Land available (year after commencement* of mining)	Justification
Creek diversions	Stage 1	2	Each stage of the creek diversion will be progressively rehabilitated as each stage becomes available. The final diversion will be in place by year six with the final rehabilitation works commencing by year seven of mining operations.
	Stage 2	4	
	Stage 3	7	
Retained flood levee	Retained flood levee	7	Retained flood levees on the eastern, southern and western side of the southwest void will be retained to prevent inundation of the residual void. These are expected to be in place following completion of the permanent creek diversion and will therefore be available for rehabilitation by year 7.
Out-of-pit spoil dumps	Southwest (including flood levee)	5	It is estimated that the southwest spoil dump will be in place by year 4 of mining activities with rehabilitation works beginning by year 5. The flood levee on the southern end of the western void is expected to be completed by year 4 and incorporated into the spoil dump final landform.
	West	15	As the western void will be operation until year 32 of mining, the western spoil dump is expected to be required until the end of mine life. Rehabilitation will commence progressively from the most northern part as the western void moves south. It is expected that land will become available from year 15 in most northern end of the spoil dump.
	North	15	As the eastern and western voids progress further south, the in-pit and west out-of-pit spoil dumps will be utilised and the north dump will be become available for rehabilitation.
In-pit spoil dump	In-pit spoil dump	20	By year 20 the eastern pit will have progressed further southeast and land closest to the diversion (the north-western side of the opencut disturbance) will become available for rehabilitation. As mining continues to progress to the southeast, land will progressively become available, and rehabilitation works started.
Tailings storage facilities (TSFs)	TDN	11	Tailings dams will receive fine tailings rejects from the CHPP which will be operational until the end of mine life. As areas are decommissioned, they will be left for several years to consolidate and allow evaporation until they are able to be rehabilitated. Together, the TDN and TDNA will accommodate 16.7 years of Project tailings. The TDN will be decommissioned from year 6 when it has reached capacity and TDNA will be decommissioned from year 10 as the TDP becomes available.
	TDNA	15	

Rehabilitation area		Land available (year after commencement* of mining)	Justification
	TDP	36	Once the TDP is operational (by year 10), it will be utilised until the end of mining and decommissioned from year 30. The TDP will not be available for rehabilitation until several years post mine closure as the tailings needs to consolidate and dry out prior to rehabilitation activities being carried out. All tailings dams will be available for rehabilitation 5 years after decommissioning.
Rail and services corridor	Retained infrastructure	32	The rail and services corridor will be available once for rehabilitation after mining operations cease in year 32.
MIA	Roads	52	Provided the roads are not retained under a landholder agreement, they will facilitate the movement of personnel throughout the site for rehabilitation purposes and will be one of the last areas decommissioned as part of rehabilitation activities.
	Built infrastructure	32	Mining activities are expected to be completed by year 32 and infrastructure areas will be available for decommissioning and removal from year 32 as these areas will no longer be needed for processing materials or accommodating personnel.
Dams	Sediment dams: SD1 SD2 SD3 SD4 SD5 SD6 SD7	30	Sediment and run-off from mining areas will be collected in the sediment dams throughout the MLs. They will be used for the duration of the mine life and decommissioned from year 30.
	Raw water dams: RW1 RW2	30	The Raw Water Dams will be used to capture run off from the local catchment for all mining years.

Rehabilitation area		Land available (year after commencement* of mining)	Justification
	Environmental dams: EV1 EV2 EV3 EV4	EV1 is decommissioned by year 10 when the north pit transitions to the TDP All others - 30	Pit sumps will collect contaminated pit water and groundwater inflows, these sumps are then dewatered to local Environmental Dams EV1, EV2 and EV3 adjacent to the pit areas for the duration of pit operations. Potentially contaminated catchment areas within the MIA report to the five environmental dams within the MIA and train load out footprint which form Environmental Dam EV4 for the duration of the mine life.

* commencement is defined as the date when topsoil stripping occurs at the Project

Table 17: Rehabilitation milestone timeframes justification

Rehabilitation Milestones (RM)	Applicable RAs	Summary rehabilitation methodology	Associated risks	Risk level assigned*	Nominated time frame (years)	Justification for assigned timeframe
RM1: Infrastructure decommissioning and removal	All RAs	• Infrastructure decommissioning and disposal	• No risks were associated with infrastructure decommissioning	N/A	1	Some mine infrastructure (e.g. haul road) will be required to facilitate rehabilitation activities and will therefore not become available for rehabilitation for several years post-closure. Decommissioning activities are considered low risk, therefore decommissioning is expected to take less than 1 year.
RM2: Management of contaminated land status	RA2a, RA3, RA4, RA5, RA6	• Remediation or removal of contaminated material (where applicable) • Determination of contaminated land status by appropriately qualified person	• Contaminated land • Surface water impacts • Groundwater impacts	Moderate	1	A contaminated land assessment will be undertaken by an appropriately qualified person. If contaminated land is identified, remediation works will be undertaken promptly. Given the moderate risk classification associated with this activity, the timeframe assigned is 1 year.

Rehabilitation Milestones (RM)	Applicable RAs	Summary rehabilitation methodology	Associated risks	Risk level assigned*	Nominated time frame (years)	Justification for assigned timeframe
RM3: Landform development (re-profiling / re shaping) of land affected by disturbance	RA1, RA2a, RA2b, RA3, RA4, RA5	• Installation of drainage features • Bulk earthworks re-shaping • Final re-profiling • Geotechnical assessment of stability	• Surface cracking • Erosion • Increased slope steepness	Moderate	1	As land becomes available, all bulk earthworks and installation of drainage features will be completed to design specifications and assessed as geotechnically stable by a suitability qualified person. The timeframe assigned is 1 year.
RA4: Capping	RA4	• Geotechnical assessment by an appropriately qualified person • Landform constructed to design parameters	• Erosion • Localised settlement • Acid mine drainage • Insufficient topsoil resources	Moderate	1	After consolidation of the TSFs the land will be promptly capped to design specifications. The timeframe assigned is 1 year.
RM5: Surface preparation (topdressing, contour ripping, soil amelioration)	RA1, RA2a, RA2b, RA3, RA4, RA5	• Surface preparation (e.g. topsoiling, contour ripping, soil amelioration activities as required)	• Surface roughness in excess of that expected for the PMLU • Erosion • Insufficient density/diversity of vegetation	Moderate	1	Subsoil and topsoil amelioration and prompt vegetation establishment are key processes to minimise the identified risks. The timeframe assigned is 1 year.
RM6: Grazing revegetation (seeding and / or planting)	RA2a, RA2b, RA3, RA4	• Revegetation with seed and / or tube stock consistent with the PMLU	• Erosion • Insufficient density/diversity of vegetation	Moderate	1	The seeding and / or planting of suitable target species is classified as Low Risk. The assigned timeframe of 1 year allows time for vegetation establishment.
RM7: Riparian habitat (native vegetation) revegetation (seeding and / or planting)	RA1	• Revegetation with seed and / or tube stock consistent with the PMLU	• Erosion • Insufficient density/diversity of vegetation	Moderate	1	The seeding and / or planting of suitable target species is classified as Low Risk. The assigned timeframe of 1 year allows time for vegetation establishment.

Rehabilitation Milestones (RM)	Applicable RAs	Summary rehabilitation methodology	Associated risks	Risk level assigned*	Nominated time frame (years)	Justification for assigned timeframe
RM8: Achievement of grazing PMLU to stable condition	RA2a, RA2b, RA3, RA4, RA5	• Vegetation monitoring and maintenance as required • Erosion monitoring	• Pests and weeds • Erosion • Vegetation failure (e.g. disease, drought)	High	10	Achievement of target vegetation and erosion criteria is dependent on climatic conditions and soil preparation. Allowance is made adverse climatic conditions such as droughts or storms that will negatively impact vegetation establishment and subsequently affect erosion characteristics. This also include repair and maintenance activities that may be required as a result. Given these factors and the 'High' risk classification, the timeframe assigned is 10 years.
RM9: Achievement of native vegetation PMLU to stable condition	RA1	• Vegetation monitoring and maintenance as required • Erosion monitoring	• Pests and weeds • Erosion • Doesn't achieve geomorphic stability • Vegetation failure (e.g. disease, drought)	High	20	Monitoring of the permanent diversion and surrounding rehabilitated area will be ongoing throughout the mine life to determine geomorphic stability of the diversion. The timeframe assigned is 20 years.
RM10: Achievement of target pasture productivity criteria for grazing PMLU	RA2a, RA2b, RA3, RA4	• Pasture productivity consistently similar to analogue sites	• Insufficient density/diversity of vegetation • Insufficient pasture productivity	High	10	Achievement of target revegetation criteria is dependent on good climatic conditions and soil preparation. Allowance is made for poor growing seasons and extreme events such as droughts or storms that will negatively impact vegetation establishment, and consequent maintenance actions that may be required. Given these factors and the 'High' risk classification, the timeframe assigned is 10 years.

Rehabilitation Milestones (RM)	Applicable RAs	Summary rehabilitation methodology	Associated risks	Risk level assigned*	Nominated time frame (years)	Justification for assigned timeframe
RM11: Achievement of native vegetation PMLU to a sustainable condition	RA1	• Vegetation structure is consistent with analogue sites	• Insufficient density/diversity of vegetation • Insufficient recruitment	Moderate	10	Achievement of target revegetation criteria is dependent on good climatic conditions and soil preparation. Allowance is made for poor growing seasons and extreme events such as droughts or storms that will negatively impact vegetation establishment, and consequent maintenance actions that may be required. Given these factors and the 'Moderate' risk classification, the timeframe assigned is 10 years.
RM12: Achievement of retained infrastructure PMLU to stable condition	RA6	• Safety and geotechnical assessments	• Erosion • Pests and weeds	Moderate	1	Given the minimal active rehabilitation work required to achieve a stable condition for retained infrastructure, the timeframe assigned is 1 year.

* See section 3.6 for risk determination.

3.5.5 Management milestones

In an equivalent manner to the Project's rehabilitation milestones, management milestones are required for all improvement areas identified as a NUMA. These identify each significant event or step necessary to achieve best practice management of the area and to minimise risks to the environment.

The nominated management milestones for the Project NUMAs (IA1) are outlined in Table 18, while the proposed milestone criteria are detailed in Table 19.

Table 18: Management milestones and their applicability to improvement area IA1

Milestone reference	Description
MM1	Achievement of final landform design
MM2	Achievement of surface and safety requirements
MM3	Achievement of sufficient improvement

3.5.6 General rehabilitation practice

The rehabilitation practices used at any mining site inevitably evolve as a result of increasing knowledge gained from experience in the following areas:

- early rehabilitation successes and failures;
- weather, subsoils, soils, local flora and fauna and revegetation species; and
- site preparation, seeding practices, the maintenance and repair of previously rehabilitated areas and/or local agricultural practices.

For this reason, the rehabilitation practices outlined in the following subsections should not be interpreted as the precise method that will be utilised for the Project, but rather as a record of current rehabilitation knowledge and intent at the time of writing; and with the expectation that rehabilitation practices will likely evolve and develop over time.

While rehabilitation objectives, performance indicators and completion criteria for the Project are detailed in sections 3.5.1 and 3.5.2, from the perspective of operational rehabilitation planning and practice, the following overarching principles are considered key.

- Ensuring that reshaped areas proposed for rehabilitation meet the required landform design principles, that prepared areas meet the rehabilitation design specification for the area, and that local site drainage has been considered and surrounding areas graded to mitigate any rainfall run-off from adjacent areas to run-on to prepared rehabilitation areas.
- Topdressing materials, final surface preparation methods and soil amelioration activities have the objective of supporting vegetative growth.
- Revegetation species selection, seeding and/or planting methods, and fertiliser applications target rapid vegetative ground cover effective at mitigating soil erosion, during the period of initial revegetation when areas are most at risk.
- Ongoing monitoring and maintenance are to be used both to assess rehabilitated area performance against completion criteria as well as to feedback to, and update rehabilitation practices; and to identify maintenance or modification requirements such that rehabilitation areas are proceeding along a trajectory towards the designated PMLU.

Table 19: Management milestone criteria

Management milestone	Applicable improvement areas	Milestone criteria	Nominated time frame (years)	Management indicators
MM1 -Achievement of final landform design	IA1	• Residual void highwall with the following angles: o ≤70° for competent rock; and o ≤45° for incompetent rock. • Predictive modelling undertaken by a suitably qualified person[1], confirming that the voids will remain as a groundwater sink and that there is no risk of contaminant release to surface or groundwaters post-mining. • Voids are assessed to be geotechnically stable by an appropriately qualified person[1]	1	• Slope of void highwall • Water level monitoring and modelling
MM2 - Achievement of surface and safety requirements	IA1	• Safety infrastructure established around the void, including the following: o adequate bunding in place confirmed to be geotechnically stable by an appropriately qualified person[1]; and o perimeter fencing and signage erected to prevent access to fauna and humans. • Bunding constructed to the following design criteria: o minimum base width of 4 m; o a minimum height of 2 m; and o located at least 10 m beyond the area potentially affected by any instability of the pit edge.	1	• Safety infrastructure established around the void
MM3 - Achievement of sufficient improvement	IA1	• Assessment by a suitably qualified person[1] that no environmental harm will occur outside of the relevant tenure boundary. • Certification from an appropriately qualified person[1] that the residual voids are safe to humans and livestock. • Certification from an appropriately qualified person[1] that the water quality and levels in the voids will not cause environmental harm to the surrounding environment.	1	• Geotechnical stability of void • Geotechnical study completed by a suitably qualified person[1] assessing the factor of safety for all final landforms

1. Appropriately qualified person means a person who has professional qualifications, training, skills or experience relevant to the nominated subject matter and can give authoritative assessment, advice and analysis on performance relating to the subject matter using the relevant protocols, standards, methods, or literature.

There may be circumstances when rehabilitation practices outside of those discussed within this PRCP may be utilised. For example, discrete areas of steeper slopes, rehabilitation failures or other scenarios that may necessitate more intensive rehabilitation practices. These circumstances will be identified, assessed and rehabilitation activities planned for as required.

3.5.6.1 Flooding

Flood studies for the Project have been undertaken by Parsons Brinckerhoff (2014a, 2014b), with a focus on flood extents and risk associated with Spring Creek, Horse Creek and the Horse Creek diversions. The proposed operational levee designs are to a 1 in 1,000 ARI maximum flood level, and are discussed further in Section 3.5.16.4. The Horse Creek diversion is discussed at Section 3.5.16.3.

ARI flood assessments incorporating the final landform were based on detailed hydrologic and hydraulic analysis of waterways in the vicinity of the Project. Parsons Brinckerhoff prepared a specific flood assessment for the Project EIS (PBA 2014a, 2014b) (Appendix G), which draws on previous hydraulic and hydrologic modelling of Horse Creek.

The Project's final landform was designed to exclude floodwaters from the residual voids. This outcome is achieved via:

- design of landforms that drain away from the void where practical;
- incorporation of flood levees on the western and southern ends of the eastern pit and on the eastern side of the western pit; and
- design of stable landforms around residual voids to divert catchments away from the void. This design removes the need for operational style levees in the final landform.

To ensure all final landforms within the Horse Creek flood extent remain stable, they have been designed to:

- achieve a low rehabilitation grade on all slopes, to assist the development of vegetative cover to improve stability;
- achieve a minimum total landform width of 90 m; and
- achieve a minimum landform height at least equivalent to the probable maximum flood water level.

Smaller drainage features within and surrounding the Project may present a risk of localised flooding. Where final landforms intersect with this flood extent, the stability of landforms will be ensured by selective placement of non-erosive materials, inclusion of rock mulch protection and increasing the size of landforms to improve structural stability.

The estimated extent of flooding for a 1 in 1,000 ARI flood event for all MLs are shown in Figure 15 (pre-mining) and Figure 16 (including permanent diversion). Modelling shows that the final landform design, including flood levees, will effectively protect the residual voids in such a flood event.

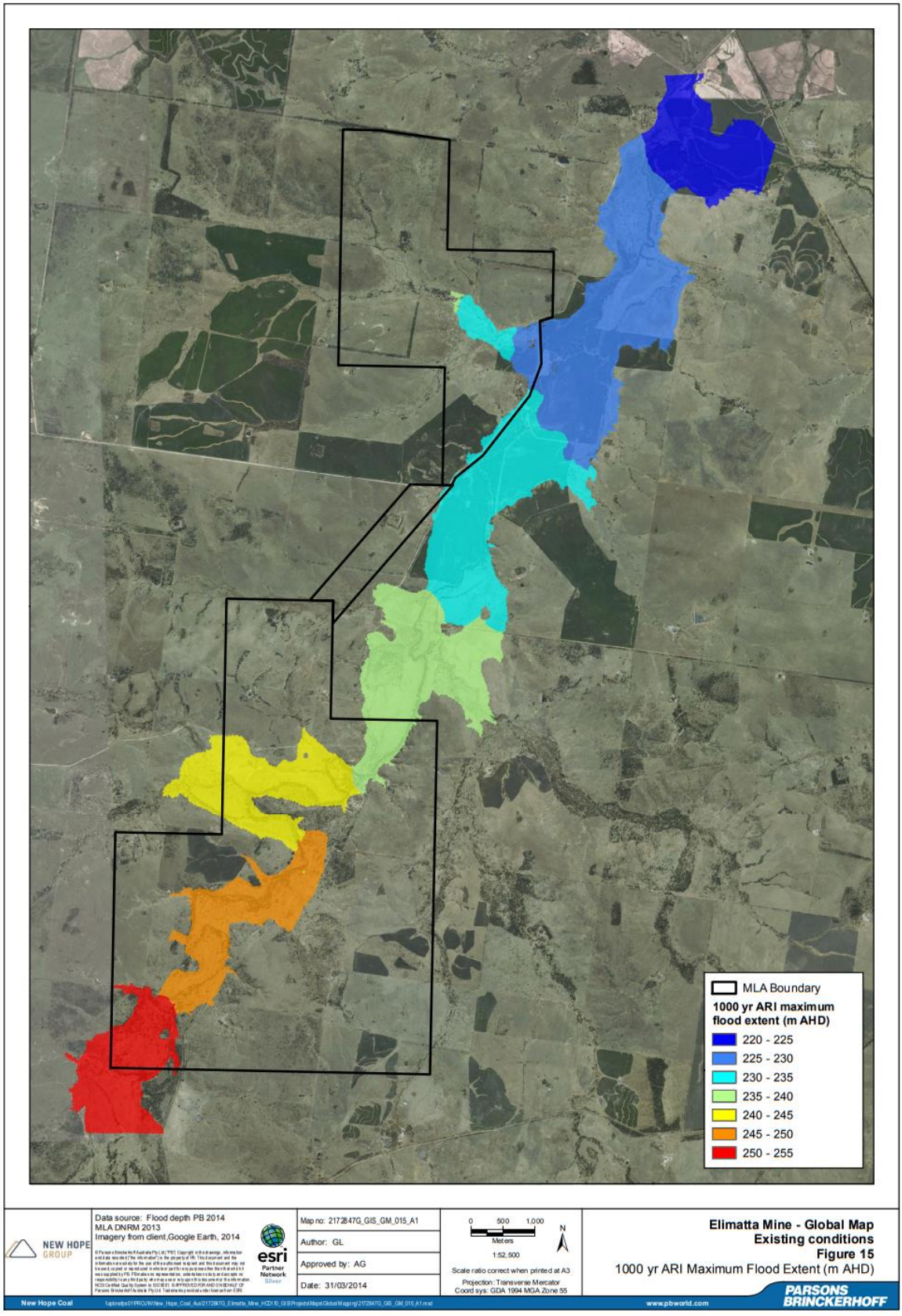

Figure 15: Pre-disturbance 1000-year ARI flood modelling MLs

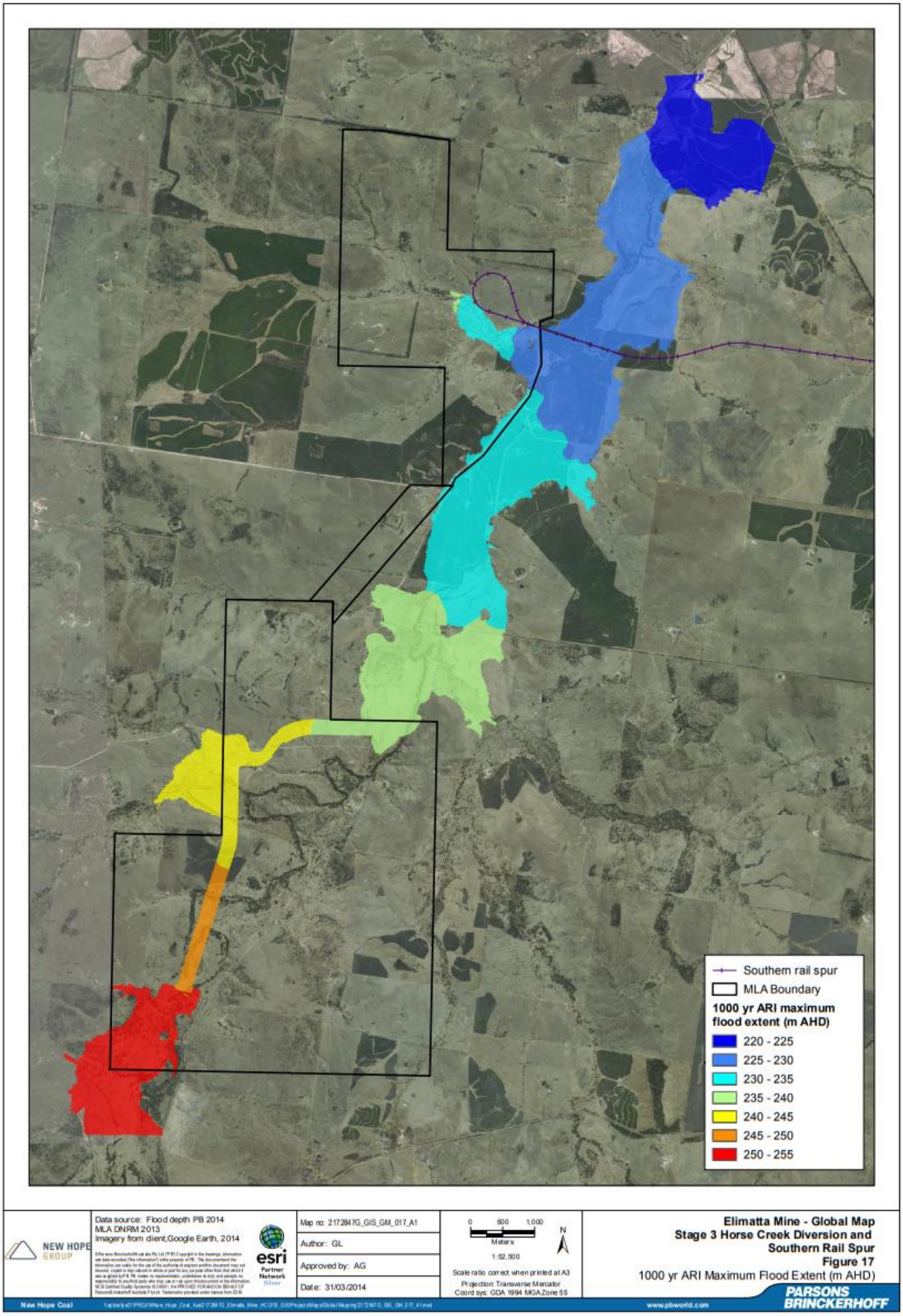

Figure 16: 1000-year ARI flood modelling with creek diversion and WSL

3.5.6.2 Geotechnical and erosional stability

The final landform design has been adopted with a view to ensuring geotechnical stability based on existing knowledge of the surface geology associated with the Project. Key design parameters are included for each of the principal RAs as described in sections 3.5.8 through 3.5.13. For higher risk RAs, geotechnical assessments are included as milestone criteria.

Erosion risk on rehabilitated landforms is greatest during the establishment phase, especially on steeper gradients. The greatest erosional risk is typically observed when >50% of the surface is exposed to rainfall and overland flow. In a study conducted on three open cut coal mines in central Queensland, Carroll, Merton and Burger (2000) found that erosion rates declined rapidly on slopes when vegetation cover was >50%, with erosion rates reduced to negligible levels by Year 6, even on steeper slopes. A literature review of erosion research conducted in the Fitzroy Basin region of Queensland (Carroll et al. 2010) also concluded that foliage surface cover of 40–60% reduces erosion to <0.5 t/ha, regardless of slope. Similarly, Loch (2000) found that approximately 50% foliage groundcover was sufficient to limit erosion rates to >0.5 t/ha on <15% slopes, for slopes up to 70 m long.

In areas proposed for PMLU of low intensity cattle grazing, the target percentage vegetation ground foliage cover (≥50th percentile of that of representative analogue sites [with similar landform parameters]) is considered sufficient to provide long-term surface stability to rehabilitated landforms. As this level of cover is expected to take 1–3 years, additional erosion control methods will be implemented as necessary until the target cover has been achieved.

3.5.6.3 Waste characterisation and cover design

Geochemistry results from the Project EIS (EGI 2012; Appendix G) indicate that overburden/interburden materials are unlikely to release significant salinity or metals/metalloids and will not require special handling (such as mine material segregation, selective placement and engineered covers) for acid rock drainage (ARD) or neutral drainage control. Consequently, a low permeability or engineered cover system is not required to successfully rehabilitate waste rock materials to create a safe, stable, and non-polluting landform.

Assessments have indicated a likelihood that interburden/overburden materials will be sodic and dispersive, and may be subject to high erosion rates if left uncovered. Placement of spoil with known sodic/dispersion potential will preferentially avoid dump surface areas. Topsoil will be utilised as a growth medium to facilitate vegetation establishment and growth able to minimise erosion risk. In the unlikely event that potentially sodic/dispersive materials may remain exposed on landform surfaces, they will be assessed and treated (e.g. with gypsum or lime) prior to revegetation if erosion cannot otherwise be controlled.

Coarse rejects produced by the coal washing process at the coal processing plant are to be progressively incorporated in both the in-pit and out-of-pit spoil dumps. Coarse rejects will be covered by at least 1 m of overburden materials followed by approximately 250 - 300 mm of topsoil. Any potentially acid forming material significantly adverse to plant growth will be buried with a minimum of 1 m using benign spoil.

At an appropriate frequency, sampling and testing will be undertaken of washery wastes, interburden/overburden and floor materials to confirm the existing assessments of low salinity and low risk of neutral mine drainage and ARD.

Surface water runoff from the Project's rehabilitated waste rock emplacements will be monitored as described in Section 3.7 to enable the detection of potential acid or saline mine drainage impacts to water quality.

3.5.6.4 Soil and capping material assessment

The Soil and Land Suitability Assessments for the Project EIS describe six SMUs within the Project area. The six SMUs were classified as the Downfall, Kinnoul, Cheshire, Rolleston, Juandah and Horse Creek Alluvium.

The Downfall, Kinnoul, Cheshire, Rolleston and Juandah SMUs possess sodic subsoils with increasing levels of exchangeable sodium within the upper 900 mm of the profile. Salinity also increases with depth within these

profiles, to levels considered moderate to highly saline beyond depths of 900–1,000 mm. An exception to this is the Horse Creek Alluvium SMU, with no signs of sodicity or salinity present within the profile.

With the exception of the Horse Creek Alluvium SMU, the soils of the Project site are all considered to have restrictions for stripping, stockpiling and rehabilitation. All soils present on the Project site are considered moderately deficient of major soil nutrients. This deficiency will be addressed as required through appropriate topsoil management practices and fertiliser additions.

Table 20 presents the SMUs, recommended stripping depths, and the approximate volumes of topsoil available for rehabilitation.

Table 20: Topsoil available for rehabilitation

SMU	Disturbance area (ha)	Stripping depth (mm)	Approximate volume of topsoil available for rehabilitation (m^3)
Downfall	212	200	424,000
Kinnoul	443	100	443,000
Cheshire	619	300	1,857,000
Rolleston	687	200	1,374,000
Juandah	337	0	0
Horse Creek Alluvium	496	1,000	4,960,000
Totals:	**2,834**	**-**	**9,058,000**

The topsoil stripping and stockpiling strategy for the Project will target the recommended soil depths for each SMU. In addition, topsoil management will aim to:

- minimise the time soil is stockpiled prior to it being used in rehabilitation;
- minimise the transport distance between topsoil stripping and stockpiling;
- stockpile topsoil up to a maximum of 2 m in height away from drainage areas, roads, machinery, transport corridors, and stock grazing areas;
- define topsoil stockpile areas to minimise the risk of accidental disturbance; and
- rip and seed with a quick establishment pasture, to limit erosion, and maintain a viable seed bank if the period of stockpiling is greater than 1 growing season or 6 months.

When accounting for a 5% handling loss, approximately 8,605,100 m^3 of suitable topsoil will be available for rehabilitation within the disturbance area. The minimum topsoil spreading depth of 250 - 300 mm requires approximately 8,502,000 m^3 of topsoil for sufficient rehabilitation over the life of the Project.

3.5.6.5 Quality assurance / quality control

Quality assurance and quality control activities are included at various stages of the rehabilitation process. These activities typically include:

- ground survey control of authorised disturbance footprints, waste rock emplacement footprints and elevations, and the locations of water management system components;
- the development of detailed rehabilitation plans and sequence for each area;
- sampling and analysis of placed topsoil to ensure agronomic suitability; and
- requirements for seed supply certification.

Rehabilitation activities will be carried out in accordance with the applicable methods described in this document and records maintained to demonstrate achievement of rehabilitation milestones. The Monitoring and Maintenance Program (as described in section 3.7) has been developed to ensure that rehabilitation progresses towards achievement of milestone criteria and ultimately relinquishment of the mining tenures. Regular rehabilitation monitoring will allow for timely identification of the need for corrective action or maintenance work, and changes to the rehabilitation strategy based on past rehabilitation successes and failures and as new information/techniques becomes available.

3.5.7 Final landform design

The Project's final landform design and the sequencing of landform development (and hence the resultant rehabilitation milestone schedule) are influenced by the nature of the mining practices proposed, including the use and establishment of infrastructure, and the proposed mine progression (Appendix C). The final landform design also takes into consideration the pre-mining landscape, the proposed PMLUs and post-mining visual amenity. The final landform design was determined from:

- analysis of the existing topography of undisturbed areas;
- flood modelling;
- in-pit and out-of-pit waste rock emplacement planning; and
- landform shaping and rehabilitation post-mining.

Figure 17 and Figure 18 present the final landform for the Project. The predicted ARI 1:100 flood levels are included on this map to provide an indication of the location of residual voids and other infrastructure in relation to this flood level. Details of rehabilitation strategies for each mine domain are discussed in the following sections.

3.5.8 Waste rock emplacements

An estimated total of 1,152,535,100 bcm of waste (overburden and interburden) is planned for extraction over the mine life. Excavated waste is to be disposed of initially in out-of-pit dumps, before being backfilled behind the mining void. Spoil dumps will be progressively rehabilitated over the life for the mine, and rehabilitation will commence as soon as possible, within two years of land becoming available (refer Table 16).

Progressive rehabilitation will function to reduce erosion potential and mitigate sediment loads in water runoff from overburden stockpiles. Spoil dumps above the natural surface will be re-contoured to achieve a maximum slope of 1V:6H (9°). This outer slope geometry and surface treatment will ensure adequate geotechnical stability and safe accessibility, while minimising the catchment and erosion potential of the slope.

The final landform has been designed to be water shedding to minimise water infiltration. Rock lined drains will be installed, where required, to manage surface runoff and prevent erosion. The slopes and tops of the spoil dumps will be topsoiled and deep ripped to better bind topsoils with subsoils.

Survey control will be utilised to manage the development of waste rock emplacements and bulk pushing of waste rock to the final design slopes.

The in-pit and out-of-pit waste rock emplacements will be revegetated in accordance with the methods described in section 3.5.15 to achieve the PMLU of low intensity grazing.

A cross section of the final landform of a typical Project spoil dump is shown in Figure 19.

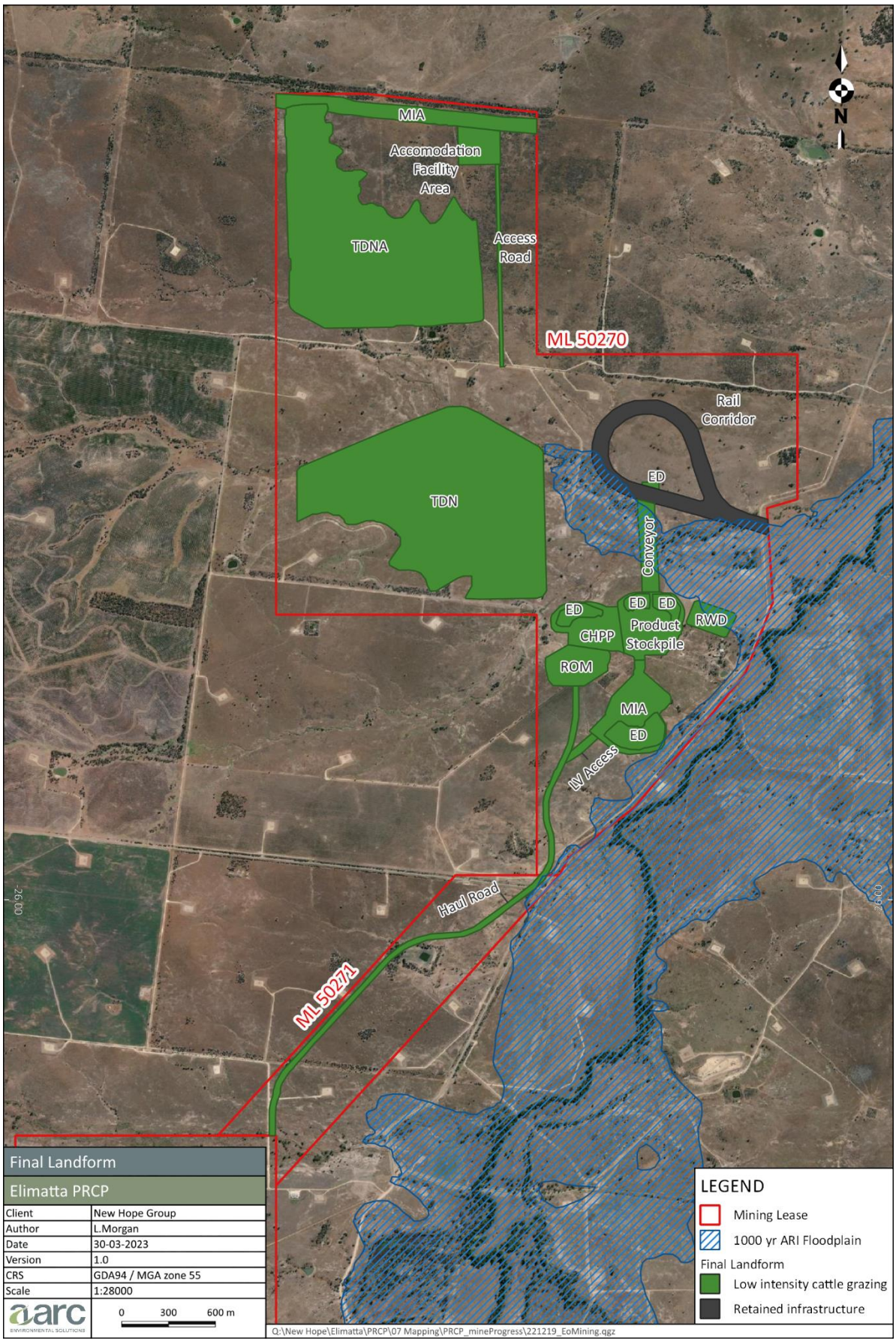

Figure 17: Final landform design (ML 50271 and ML 50270)

Figure 18: Final landform design (ML 50254)

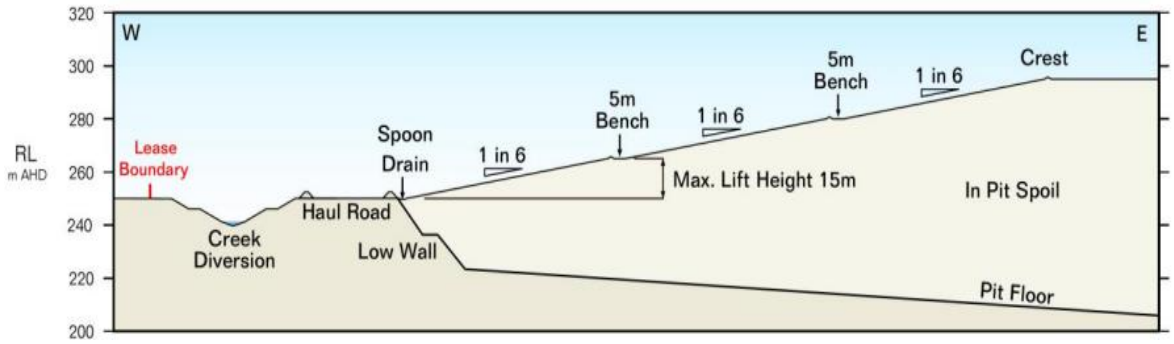

Figure 19: Typical waste dump final landform profile

3.5.9 Tailings storage facilities: surface TSFs (TDN and TDNA)

Dam TDN is planned to receive fine tailings between mine years 1 and 6, at which stage this tailings dam will have reached its capacity. Tailings will then be deposited at TDNA for years 6 to 10. A depth of at least 3 m will be left between the final tailings surface and the dam's crest level, to facilitate capping and stabilisation of the captured tailings.

3.5.9.1 Rehabilitation of outer slopes

The two surface TSF containment walls will be limited to a maximum height of 16 m. To ensure an adequate long term geotechnical factor of safety, the containment walls will be constructed with an outer slope angle of the order of 1(V) : 3(H) (equivalent to 18°).

Given their modest scale, the containment walls will be constructed as a single slope (without contour banks or down slope drains). The surface treatment of the outer slopes will involve the placement of a rocky soil cover. The rock content will provide erosion protection while the soil content will facilitate moisture retention to support and maintain native vegetation to form a corridor for native fauna and provide visual amenity.

The outer slope geometry and surface treatment will ensure adequate geotechnical stability and safe accessibility, while minimising the catchment and erosion potential of the slope. Excess rainfall runoff from the remediated tops of the surface TSFs will be directed to purpose-built drain structures and not be directed over the TSF outer slopes, to avoid the concentration of rainfall runoff and the heightened potential for erosion that might result.

3.5.9.2 Rehabilitation of upper surfaces

Rehabilitation will involve the placement of a cover to allow revegetation and achieve the agreed post-mining land use. The geotechnical stability of the washery wastes and the placement of a cover are to be facilitated by dewatering, desiccation and strengthening of the full depth of the deposit.

It is anticipated that the tailings stored in the surface TSFs will undergo consolidation and desiccation for a number of years before rehabilitation is undertaken. This will assist in the material to achieve sufficient shear strength to allow cover placement using trucks and dozers. Prior to cover placement being attempted, the (peak and remoulded) shear strength profile with depth of the consolidated and desiccated tailings will be assessed by vane shear strength testing. An average vane shear strength of at least 30 kPa (allowing for a low bearing pressure D6 swamp dozer (<35 kPa) and the weight of placed cover material) will be required over the upper 2 m depth of the tailings to ensure that a cover of about 2 m thick can be safely placed.

The cover material will be durable (that is, non-slaking), well-graded including coarse particles up to about 50 mm in size, and non-sodic so as to not inhibit rooting by subsequent vegetation. Suitable material for cover purposes will be sourced from spoil excavated during mining. Weathered sandstone spoil is preferred and will be stockpiled during mining for later use as cover fill. Topsoil will be spread to a nominal 250 - 300 mm thickness to support subsequent vegetation.

Once available for rehabilitation, the cover material will be dumped by trucks in batches on the perimeter of the stored tailings, and left for about 2 weeks to allow the tailings to drain, consolidate and strengthen under the cover material weight. The fill will then be progressively pushed over the tailings along a broad front to a height of about 1 m using a low bearing pressure D6 swamp dozer, ensuring that "bow wave" failures are not generated in the tailings at the leading edge.

A second 1 m lift will then commence in a similar manner to the first. This process will continue progressively until the entire tailings surface is covered by approximately 2 m of fill. Once covered, the shear strength of the consolidated, desiccated and loaded tailings will be sufficient to support a post-mining grazing or native habitat land-use.

Once the placed cover material has settled, the completed surface will be contoured to drain gently (at nominal slopes of about 1%) towards the location of a spillway, and then covered with a nominal 250 - 300 mm of topsoil and seeded to suit the post-mining land-use of low intensity cattle grazing. Any significant drainage channels across the covered tailings will be sheeted with coarse rock for erosion protection, where required.

It is expected that the volume of cover required during rehabilitation of the surface TSFs will be provided from the expansive spoil reserve mined over the 32 year mine life. Over 1 billion bcm of spoil is expected to be excavated and stockpiled during the course of operations. The proposed excavated waste management strategies will assist in identifying the distribution and extent of sodic and dispersive materials.

Figure 20 shows a cross section of the rehabilitated final landform of a typical surface TSF for the Project.

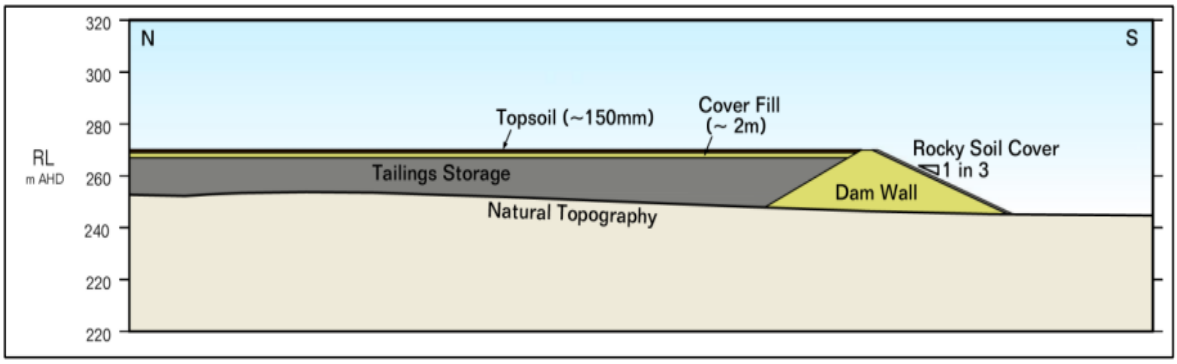

Figure 20: Surface TSF final landform design

3.5.10 Tailings storage facilities: in-pit TSF (TDP)

The Project's northern mine pit will cease operations by year 10 and will be transitioned into an in-pit TSF (TDP). The TDP is to be divided into three separate areas with each to be filled with tailings, at which point, each area will be left to consolidate and then capped and rehabilitated. Modelling suggests that TDP will become almost completely filled with tailings by the end of the mine life and could be covered with topsoil for rehabilitation. Each area of the tailings will become available for rehabilitation several years after decommissioning to allow for consolidation and evaporation. The rehabilitation methodology is discussed below.

3.5.10.1 Rehabilitation methodology

The first step of rehabilitation of the TDP will occur by placing a separation layer over the exposed tailings surface. This cover will form a capillary break over the underlying tailing surface. It is proposed that the cover will likely need to be placed by hydraulic means . Alternatively, it may be possible to end-dump spoil into wet, uncrusted in-pit tailings. It is anticipated that the in-pit tailings will undergo more limited consolidation than the tailings in the surface TSFs; as TDP will be filled at a higher rate of rise. Given this, the in-pit tailings will be unlikely to achieve sufficient shear strength to allow a cover to be placed by trucks and dozers. Final confirmation of the method of cover placement will depend on the bearing capacity of the tailings at the

time of rehabilitation. It is anticipated that the final design for the top surface of the TDP will be 1V : 100H (equivalent to 0.5°) after consolidation and cover placement occurs.

Water will first be drained from the tailings surface to facilitate cover placement, and to facilitate drainage of the cover itself following hydraulic placement to maximise the strength gain in the tailings. Hydraulic placement of the cover will be achieved using a dedicated, small-scale, mobile pumping plant, mounted on a skid to allow it to be moved around the perimeter of TDP. Cover placement will commence from the perimeter of the tailings, the cover will be built-up locally to about 2 m depth, and the discharge pipeline will be progressively extended out over the trafficable cover already placed, to complete the cover. This technique was successfully demonstrated at Red Dome Gold Mine in North Queensland for placing a cover of coarse-grained fill over previously submerged, soft, in-pit tailings.

The cover material will be durable (that is, non-slaking), and comprised of well-graded material including coarse particles up to about 50 mm in size, and non-sodic so as to support vegetation. Suitable fill for cover purposes will be sourced from the spoil excavated during mining. Selected spoil will be stockpiled during mining as close to the TSF as practicable for later use as cover material. The volume of cover required during rehabilitation of the TDP will be provided from the spoil reserve to be mined over the 32 year mine life. Over 1 billion bcm of spoil is expected to be excavated and stockpiled during the course of operations. The proposed excavated waste management strategies will assist in identifying the distribution and extent of sodic and dispersive materials.

Gradual covering, by hydraulic means, of the tailings deposited in TDP will promote drainage, consolidation and strengthening of the loaded tailings. This will allow the build-up of a 2 m thickness of fill to form a cover, with sufficient bearing capacity to make the surface trafficable for low bearing pressure equipment such as a D6 swamp dozer. The feasibility of this has been demonstrated at Coppabella Mine in Central Queensland, where the upper, coarse-grained, co-disposal beach was successfully developed to a thickness of only 0.5 m on segregated fines, providing adequate bearing capacity for a small scale machinery up to approximately 4 tonnes GVM.

Once the TDP has been covered it will be revegetated (as per section 3.5.15) to a PMLU of low intensity cattle grazing.

Figure 21 shows a cross section of the final landform design for the TDP.

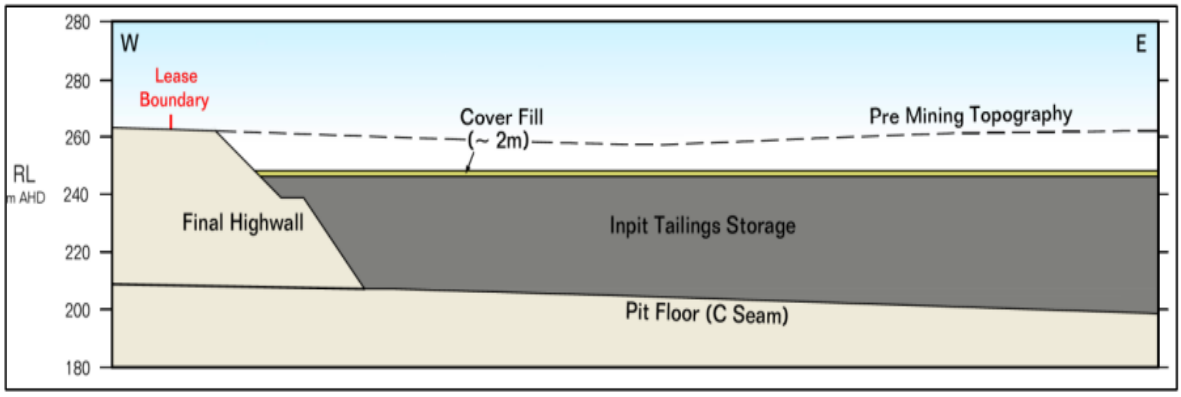

Figure 21: TDP final landform design

3.5.11 Residual voids

3.5.11.1 Final landform design

The Project's residual voids will be left in a safe condition by constructing a safety bund wall around each void from competent rock and/or fencing, depending on the terrain, to limit human and animal access. The safety bund wall will be constructed as described in Technical Guidelines for the Environmental Management of Exploration and Mining in Queensland (DME 1995). This guideline states that the bund wall should be of a

minimum height of 2 m, with a minimum base width of 4 m, and be located at least 10 m beyond the area potentially affected by any instability of the pit edge.

To ensure the safety of the residual void, the final highwall and low wall slopes will be assessed by a suitably qualified geotechnical engineer.

The following factors will be considered when assessing the geotechnical stability of high walls:

- long term residual void water levels;
- height and inclination of slope and number and spacing of intermediate benches (as may be required to achieve the final slope);
- shear strength of the highwall soils and rock; and
- density and orientation of fractures, faults, bedding planes, and any other discontinuities, and the strength along them.

The control of surface inflow into the residual void is essential for the long-term management of water quality within the void and will also aid in the control of erosion to low walls and high walls. Surface water flow can cause slope deterioration and ultimate failure. Drainage will be directed away from highwall faces through the construction of interceptor channels / drains around the perimeter of the highwall.

As mining progresses, waste overburden material and coarse rejects will be progressively placed back into the already worked pit void. The landforms of the spoil material placed back into the pit void will be shaped and reinstated in a timely manner and the batter slopes of all disturbed surfaces will be worked along the contour to minimise the likelihood of scour down the batter face. The eastern and western residual voids will be designed to the achieve a maximum slope of 1V:0.5H (equivalent to 26°) (competent rock) and 1V:1H (equivalent to 45°) (incompetent rock). This design will ensure adequate geotechnical stability and safety.

3.5.11.2 Residual void hydrogeology

Groundwater modelling was conducted by AGE (2012) for the Project EIS and the following sub-sections detail their findings. An update to the groundwater modelling was conducted by AGE in November 2015 to assess new groundwater impacts from the adjacent Woleebee coal seam gas fields operated by QGC.

Residual void inflow

Groundwater modelling conducted by AGE in 2012 determined that groundwater inflows into the mining operation will occur directly from the mined coal seams. The simulation of inflow into the residual voids incorporated several conditions including:

- horizontal and vertical hydraulic conductivities of 1,000 m/day;
- recharged was increased to reflect direct capture and runoff from rainfall; and
- evaporation from within the void space.

The simulated volumes were generally less than 1 ML/day for the smaller northern and western pits (Figure 22). The model simulated higher inflows up to 2.5 ML/day for the much larger south-eastern open cut.

Revised ground water modelling conducted by AGE in 2015 to incorporate the adjacent Woleebee coal seam gas fields. QGC's Woleebee gas field is located approximately 20 km to the south of the Project. The revised modelling incorporated the operation of the adjacent Woleebee gas field in the drawdown groundwater level predictions and verified the contribution of spoil recharge in the model.

As recommended by a review of the groundwater model by JBT (2017), the model was also rerun to determine the proportion of groundwater flow from the Walloon Coal Measures in the mine highwall, and the spoils that form the open cut pit low wall.

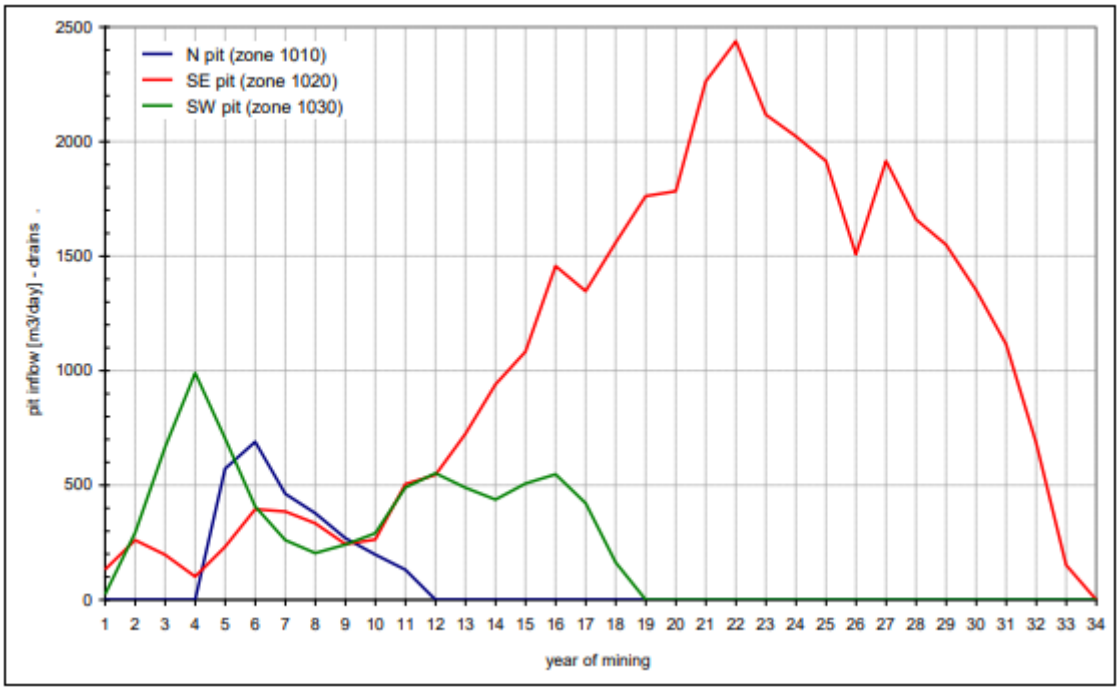

Figure 22: Predicted inflow from coal seams

Revision of the AGE groundwater model found that there is a significant reduction in groundwater flow to the mine pit due to the depressurisation created by the Woleebee gas field. Predicted pit inflow from the updated model reduces the 2012 prediction of 427 ML/year to an average of 206 ML/year over the mine life. The adjusted cumulative groundwater take predicted by this additional modelling is shown in Figure 23.

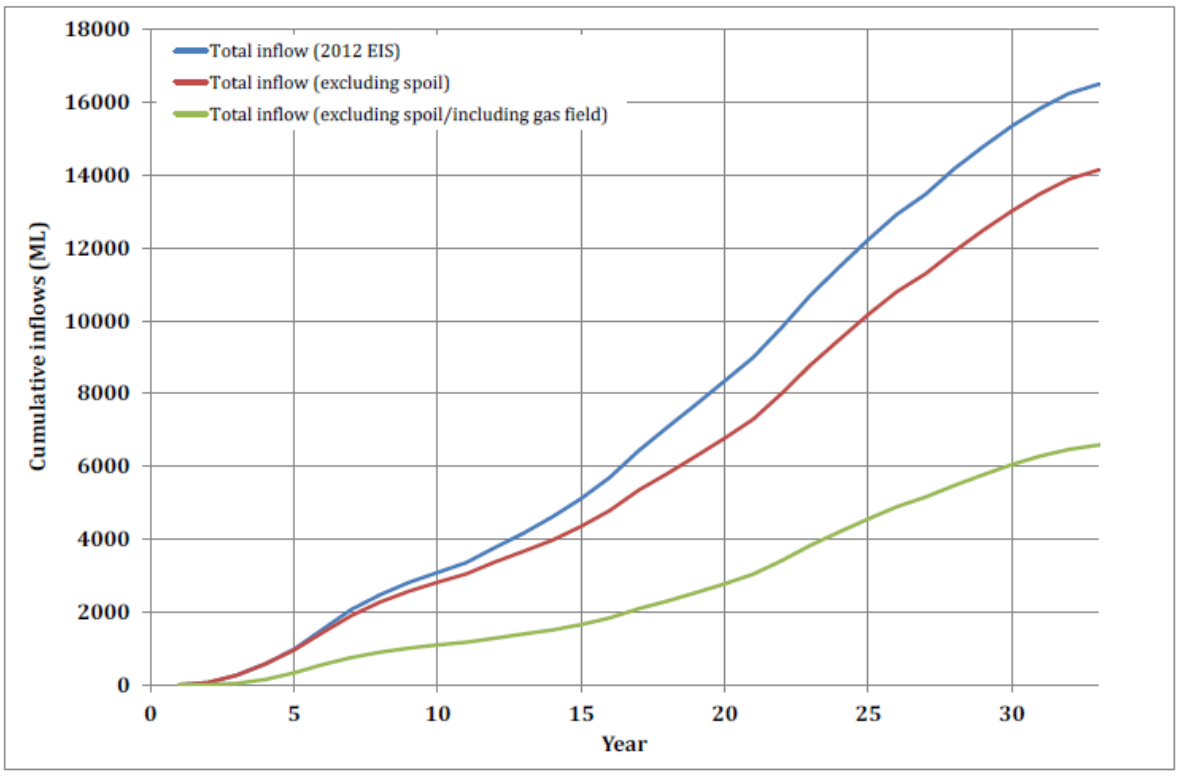

Figure 23: Cumulative groundwater take

3.5.11.3 Residual void hydrology

A water balance model was developed to determine the water levels within the residual voids up to 750 years post mining (AGE 2012). It is expected that the east and west residual voids will remain as a ground water sink and fill to between 220 mASL and 230 mASL (Figure 24 and Figure 25). Water levels were modelled along three cross sections of the southern ML and detail the pre- and post-mining landform topography and groundwater levels affected by the Project (refer Figure 26, Figure 27, Figure 28, and Figure 29). The model simulated the recovery of groundwater up to 750 years post mining and predicted the groundwater and aquifer hydraulic properties. The model also simulated the groundwater recovery levels and the formation of void lakes.

The residual void in the southeast of ML 50254 is estimated to have a capacity of 70,000 ML and will have a catchment of approximately 135 ha. This catchment includes the void floor at approximately 190 mAHD and batter slopes. The surrounding land will be graded to drain runoff west into Horse Creek.

The final western void in ML 50254 will have an estimated capacity of 28,000 ML and a catchment area of approximately 102 ha. This catchment will include the void floor at approximately 185 mAHD and batter slopes. The surrounding area will be graded to drain runoff east towards Horse Creek.

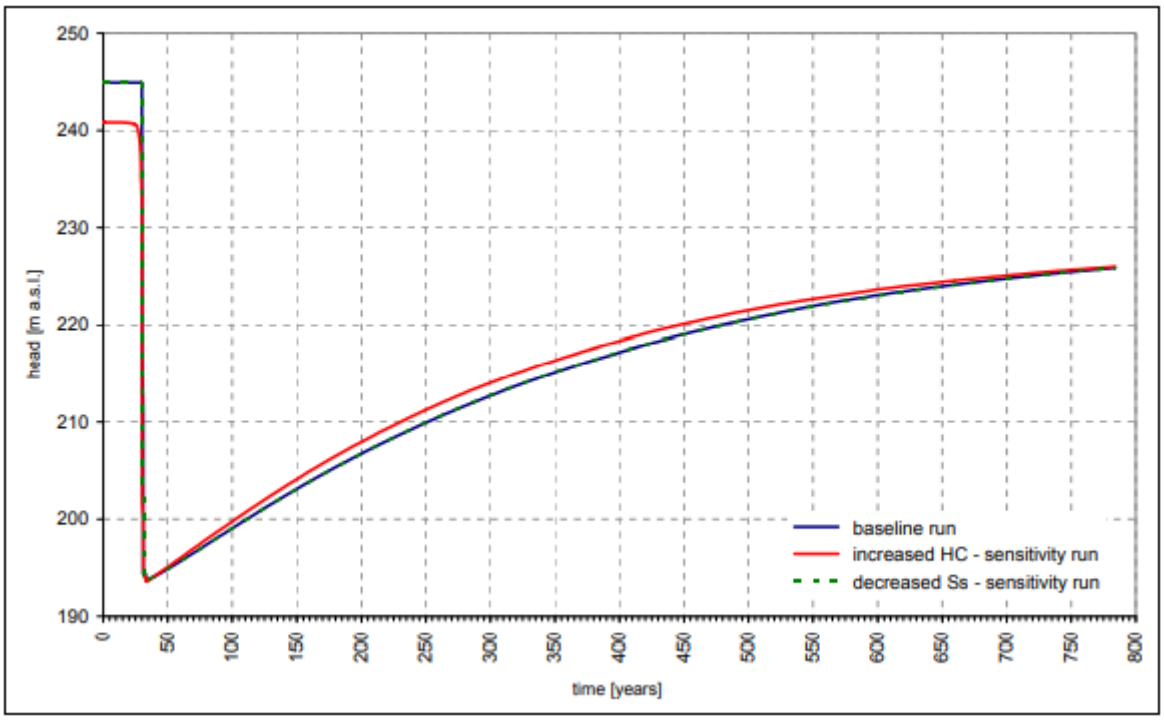

Figure 24: Predicted water levels in the southeast residual void

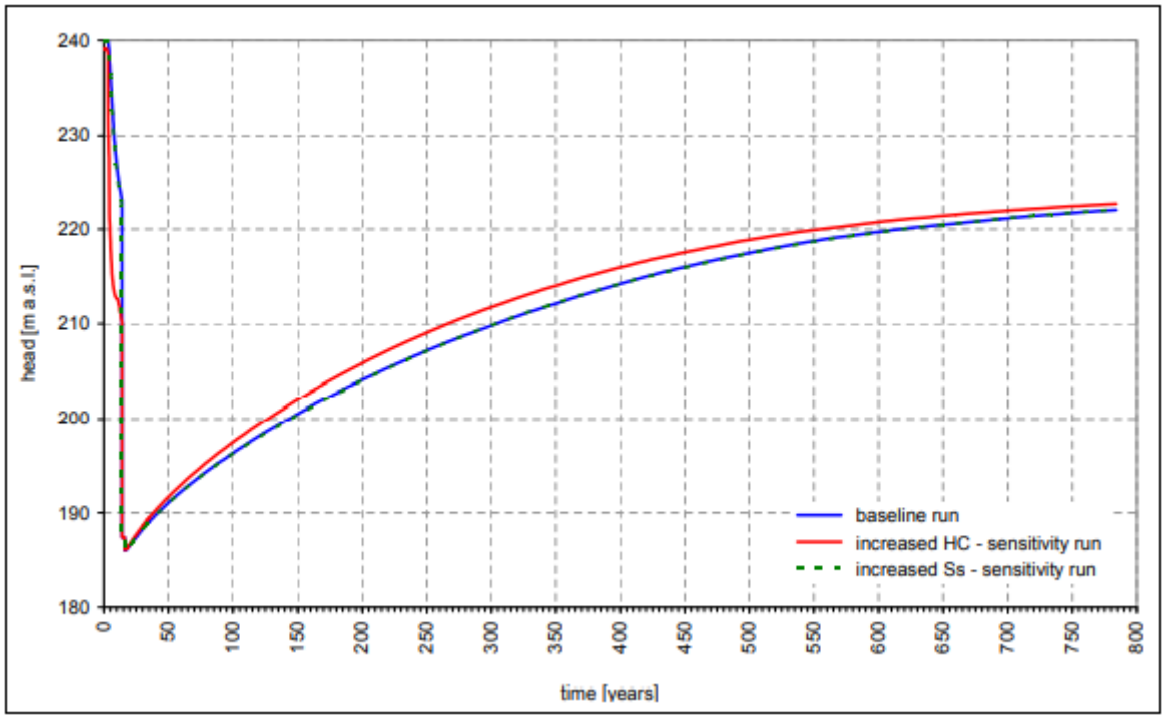

Figure 25: Predicted water levels in the southwest residual void

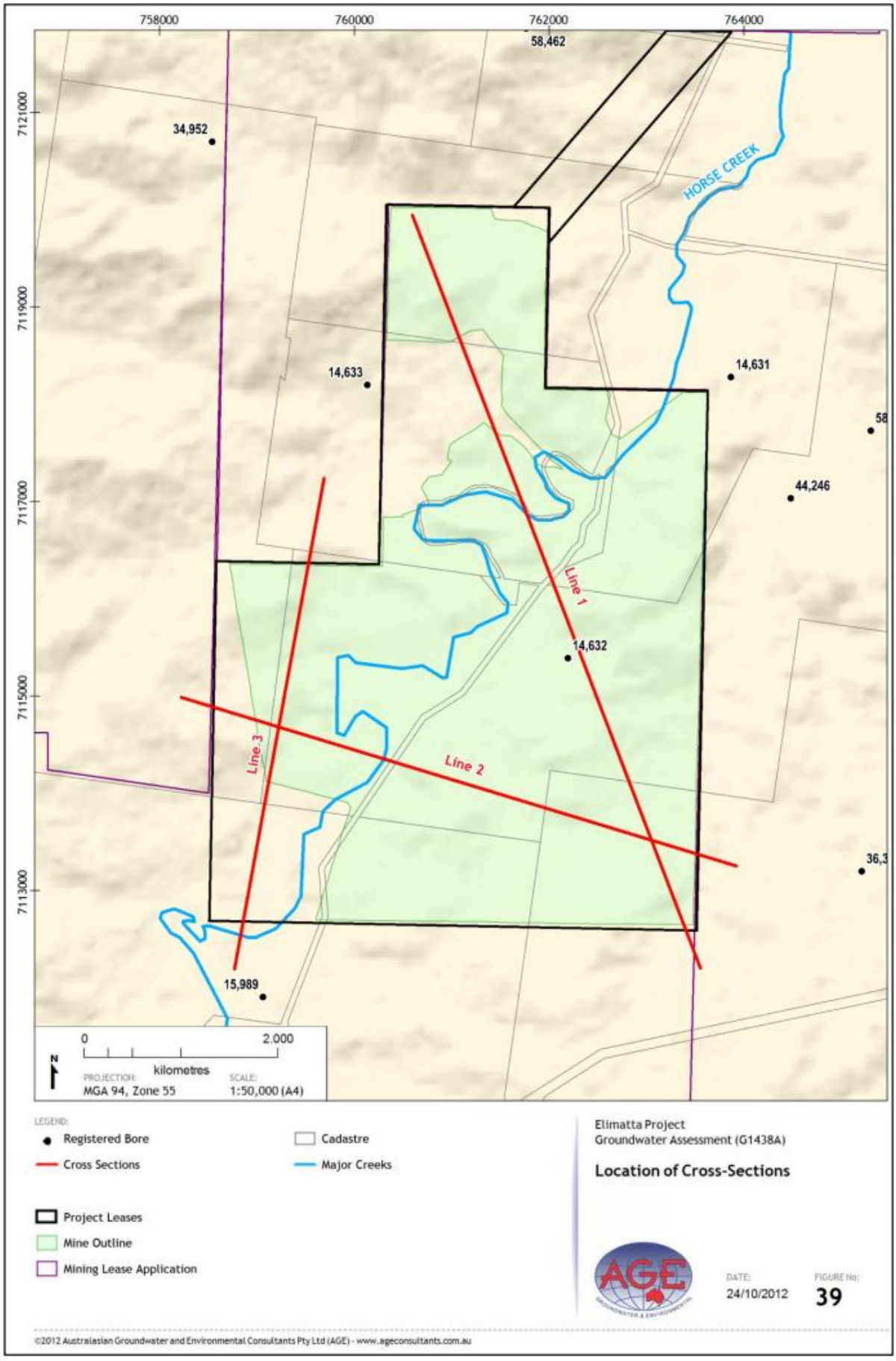

Figure 26: Groundwater level cross section locations

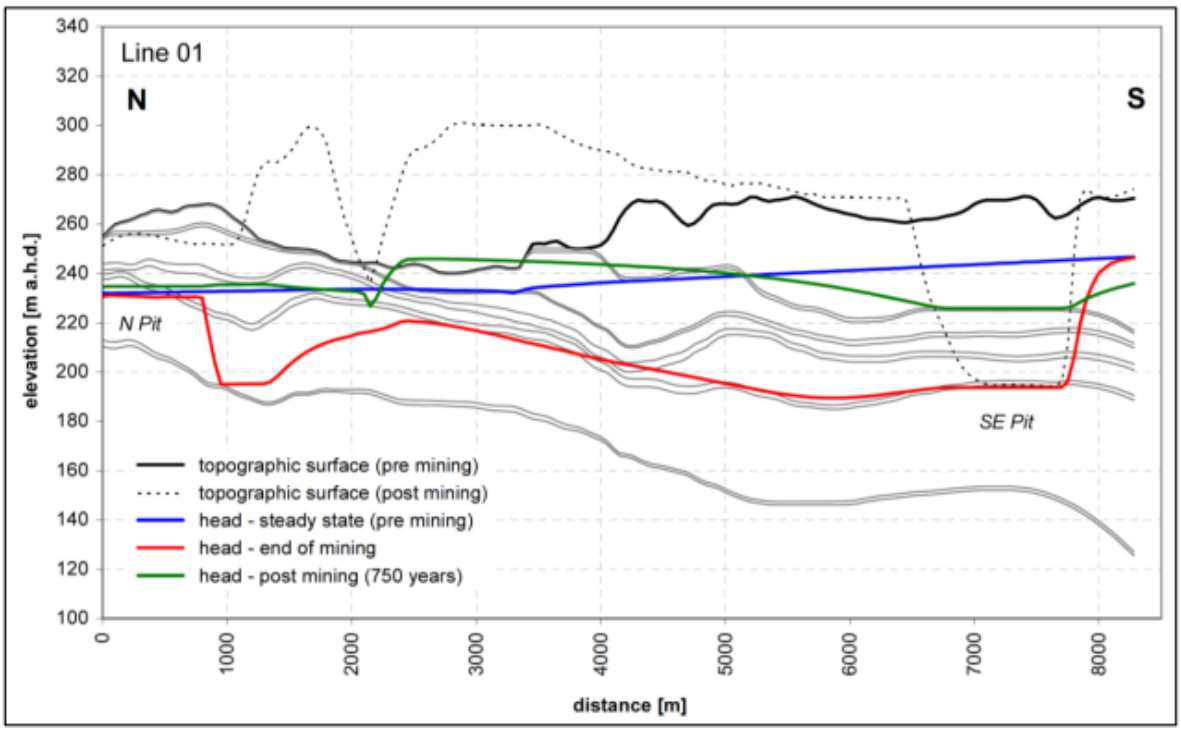

Figure 27: Groundwater cross section – Line 1

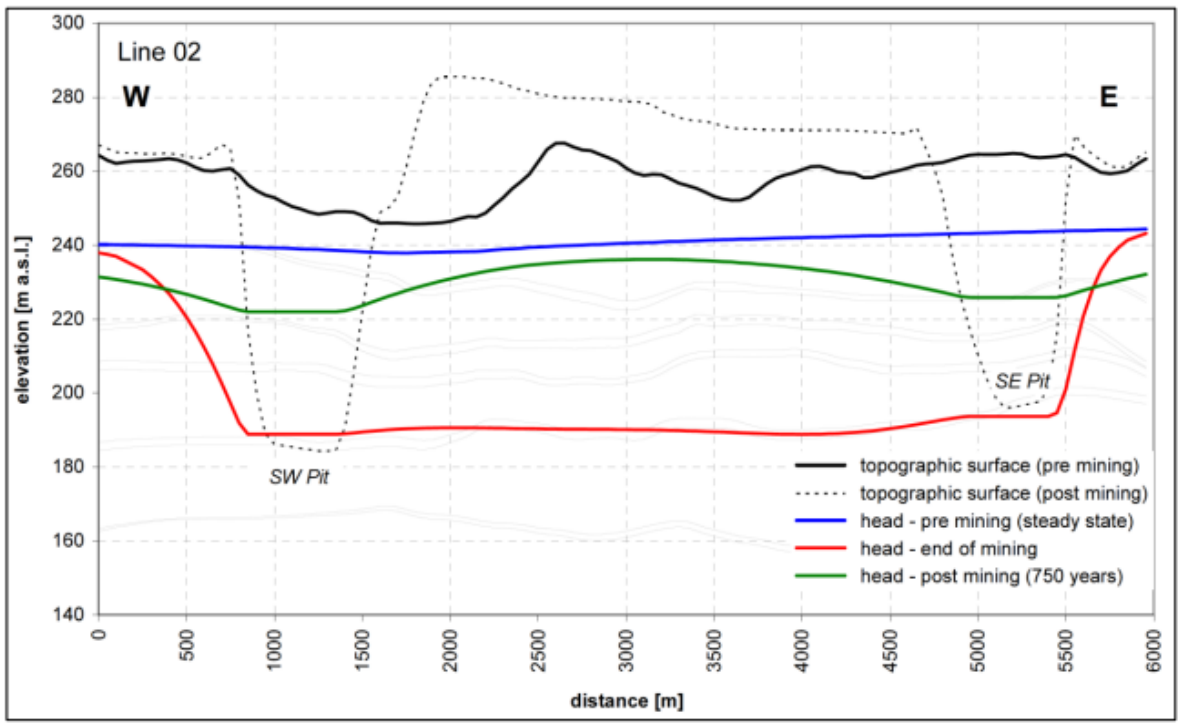

Figure 28: Groundwater cross section – Line 2

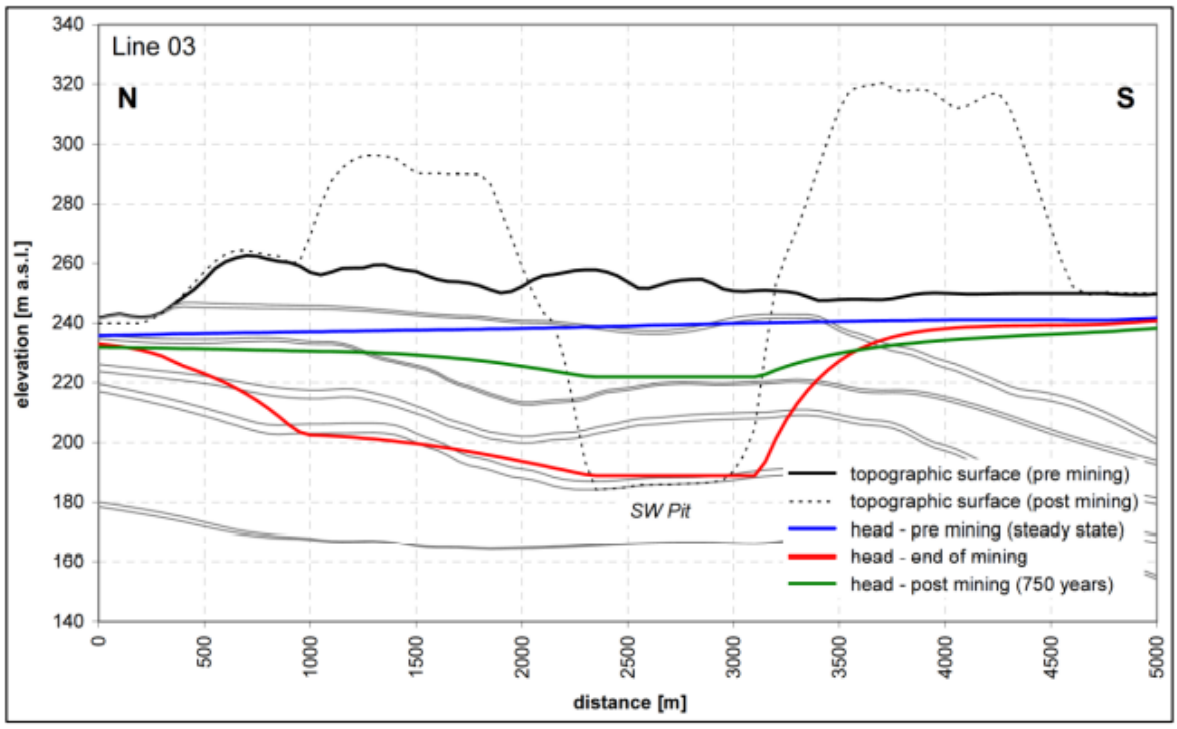

Figure 29: Groundwater cross section – Line 3

3.5.12 Exploration areas

As a majority of the southern ML (ML 50254) is expected to be disturbed as mining progresses. Any disturbances related to further exploration or grade control works are not expected to require rehabilitation as part of a LOM schedule. Where exploration disturbances are temporarily rehabilitated to mitigate any environmental impact, the following will occur:

- drill holes will be capped; and
- all sample bags and rubbish removed.

3.5.13 Infrastructure areas

Prior to rehabilitation and decommissioning of all Project related infrastructure, any potential future uses for the infrastructure will be assessed in consultation with relevant stakeholders. All infrastructures will be removed unless formal written agreements have been reached with the post-mining landowners/managers for its ongoing use, maintenance, and management. Where agreements have not been reached to retain infrastructure and buildings they will be removed from site in an acceptable and suitable manner.

Plant and equipment footings will be excavated to a depth of at least 1 m below ground level. Disturbed areas will then be recontoured to the approximate pre-mining landform and revegetated (see section 3.5.15).

3.5.13.1 Buildings

In the absence of a continuing use for the Project's buildings post relinquishment of the mining leases, all buildings and infrastructure (including footings and foundations) will be demolished and either removed from site, or if materials constitute clean construction and demolition waste, it will be buried within the final in-pit spoil dump. All recoverable scrap steel will be sold and recycled, with the remaining non-recyclable wastes disposed of to an authorised landfill. Prior to disposal, all wastes will be assessed and classified in accordance with the Environmental Protection (Waste Management) Regulation 2000. A land contamination

assessment will be undertaken where potential contamination exists. Contaminated materials will either be remediated *in-situ* or excavated and disposed of to an appropriately licensed facility.

Areas from which buildings and other infrastructure have been removed will be ripped, re-contoured and revegetated.

3.5.13.2 Roads

Roads that are not required post Project completion will be reshaped, topsoiled, and ripped and seeded. It is likely that access roads may be retained on site as beneficial infrastructure for future use by landholders under a landholder agreement.

3.5.13.3 Workshops, CHPP, chemical and fuel storages

All workshops, chemical and fuel infrastructure will be removed from site at completion of mining and sold, recycled or appropriately disposed of to a facility authorised to accept such waste.

A land contamination assessment will be undertaken on all workshops and chemical/fuel storages. Contaminated materials will either be remediated *in-situ* or excavated and disposed of to an appropriately licensed facility.

Following removal of infrastructure, land will be ripped, re-contoured and revegetated.

3.5.13.4 Powerlines

Rehabilitation of powerlines and other associated electrical infrastructure includes dismantling and removal from site. It is likely that power infrastructure may be retained on site as beneficial infrastructure for use by future landholders through agreements with local government and relevant power companies.

3.5.13.5 Water Supply Pipelines

There are three options associated with the decommissioning of the water supply pipelines:

- abandonment – where the pipeline is purged, physically disconnected from the point of supply, and sealed at both ends;
- removal – where the pipeline is purged from removed from its easement in entirety; or
- beneficial re-use – where sale or donation to a third party occurs which sees the pipelines continue to be beneficially used.

International best practice recognises that removal of the pipeline from the easement is rarely a commercially or environmentally viable option for decommissioning. Therefore, it is likely that pipelines will either be abandoned or re-used by a third party.

3.5.14 Surface preparation

Topsoils and ameliorants

Soil assessments have indicated that some of the soils at the Project site may be prone to sodicity and/or present other characteristics that can present limits for their re-use in rehabilitation. These findings can be summarised as follows.

- Horse Creek Alluvium SMU: no chemical limitations.
- Cheshire SMU: below 300 mm salinity (0.290 dS/m), pH (8.82) and sodicity (8.30%) increase to moderate to high levels.

- Rolleston SMU: below 200 mm there is a risk of soil dispersion from sodic subsoils (7.40%), moderate salinity (0.259 dS/m) and strong alkalinity (pH 8.63).
- Downfall SMU: sodicity and salinity risks increasing with depth below 200 mm with an ESP of 18.70% up to 35.60% and salinity of 0.680 dS/m up to 2.060 dS/m.
- Kinnoul SMU: moderate erosion and sodicity occurring below 100 mm with an ESP of 7.36%.
- Juandah SMU: no topsoil stripping recommended. Within the first 20 cm ESP is 6.45% increasing to 16.10%, salinity is variable with maximum levels of 2.420 dS/m, and the soil is strongly alkaline (pH 9.19).

The results show that some of the soils within the Project area may require amelioration either due to the elevated ESP or alkaline characters recorded. Specific management techniques will be employed to areas that require them for successful rehabilitation.

Suitability of both topsoil and spoil then emerges as an important analysis to be done in order to define thresholds parameters of the designed landform and to evaluate amelioration if required. For topsoils used in rehabilitation, typical specifications necessary to achieve success are shown in Table 21.

Table 21: Topsoil Suitability

Parameter	Suitable Range
pH	6 – 8.5
EC_{SAT} (dS/m)	≤ 4
ESP (%)	< 6

The suitability of the subsoil / surface spoil material will be dependent on salinity as well as sodicity as indicated in Table 22 and Table 23. The following adopted thresholds provide guidance for achieving rehabilitation success.

Table 22: Electrical Conductivity effect on spoil suitability

Rating	EC_{SAT} (dS/m)	Suitability
Non-saline	< 2	Suitable
Slightly saline	2-4	Suitable
Moderately saline	4-10	Marginally suitable (no amelioration available)
Highly saline	10-16	Unsuitable
Extremely Saline	> 16	Unsuitable

Table 23: Sodicity effect on spoil suitability

Rating	ESP (%)	Suitability
Non-sodic to sodic	0-14	Suitable
Strongly sodic	14-23	Marginally suitable, with gypsum
Extremely sodic	>23	Unsuitable

For spoils that are marginally suitable, gypsum is generally recommended to be spread over the surface of recontoured spoil prior to topsoil placement.

Contouring

The preparation of disturbed areas prior to the establishment of vegetation will involve surface contouring to minimise erosion and maximise water retention. Recreated landforms will be contoured as per the final landform design with spoil dumps shaped to resemble low hills.

Topsoil spreading

The surface of post-disturbance rehabilitation sites will be topsoiled to a depth of 250 - 300 mm where suitable quantities of topsoil are available, and erosion control structures constructed where they are required.

Ripping

Following contouring, ripping of the surface will be carried out. The design criteria for ripping operations are detailed in Table 24. The spacing between rip lines is determined by the slope of the land, which acts to reduce soil erosion and increase plant establishment rates. Where soils are highly compacted, a more suitable ripping depth of 300 mm or greater will be employed.

Table 24: Design of ripping operations for post-disturbance surface preparation

Slope	Minimum ripping depth	Tyne spacing
>10%	200 mm	<1.5 m
5–10%	200 mm	<2.5 m
<5%	200 mm	<5 m

3.5.15 Revegetation

The key objective of the Project's revegetation plan is to ensure that a self-sustaining vegetation community is established. The plant species should aim to conform to the agreed PMLU and/or reproduce the pre-existing community composition.

To maximise revegetation success, revegetation activities will be scheduled during spring before the heavy wet season rainfall begins. Seeding may also occur during the summer months, depending on rainfall. Seeds will be sown using direct seeding or tube stock depending on the species, slope gradients and areas to be revegetated.

Seed stocks will be checked for viability upon purchase and seeded as soon as possible. Seeds may be spread by hand, tractor or aerially. Hand seeding is suitable for small areas up to 5 ha, tractor with a rear spreader attached is more suitable for larger areas. Aerial seeding may be used on long or steep slopes (i.e. highwall). Seeds should not be buried over 5–10 mm in depth in the soil.

Areas will be seeded at rates indicated in Table 25, Table 26 and Table 27 for the applicable PMLU. A provisional seed selection has been developed from a complete list of identified flora species within the Project area identified during the Terrestrial Flora and Fauna Assessment (AARC 2014) including the dominant species found within each RE described (see Appendix G). The seed mixes listed are indicative only and are subject to change with season, availability, and following assessment of rehabilitation performance. All species listed are suited to the central Queensland climate and site-specific environmental conditions. In addition to the pasture species selected for grazing PMLUs, a native canopy cover has been selected to provide shade for livestock.

Recommended seed sowing rates have been selected based on recommendations from the Department of Agriculture and Fisheries (2017), relevant guidelines (DAFF 2013; Australian Government 2016), and Future Beef (2022). Where information regarding sowing rates was unavailable, the following equation was used:

$$Sowing\ rate\ (ka/ha) = \frac{target\ plant\ population\ (p/m^2) \times thousand\ grain\ weight\ (g)\ \times 100}{\%\ germination\ \times \%\ emergence}$$

Monitoring of rehabilitated areas will commence at the wet season following rehabilitation works and will be carried out in conjunction with the Rehabilitation Monitoring and Maintenance Program (section 3.7.1).

Table 25: Current indicative species and sowing rates for low intensity grazing PMLU

Scientific name	Common name	Preliminary sowing rate (kg / ha)
Dicantheum sericeum	Queensland Bluegrass	1-4
Cenchrus ciliarus	Buffel Grass	1-2
Megathyrsus maximus var. trichoglume	Green Panic	3-5
Themeda triandra	Kangaroo Grass	2-4
Chloris gayana	Common Rhodes Grass	2-4
Bothriochloa bladhii	Forest Bluegrass	1-2
Rhynchosia minima	Rhynchosia	2-3

Table 26: Current indicative species and sowing rates; shade trees in a low intensity grazing PMLU

Scientific name	Common name	Preliminary sowing rate (kg / ha)
Canopy		
Acacia harpophylla	Brigalow	0.2
Casuarina cristata	Belah	0.1
Atalaya hemiglauca	Whitewood	0.4
Lysiphyllum cunninghamii	Bauhinia	0.2
Brachychiton populneus	Kurrajong	0.9
Eucalyptus populnea	Poplar Box	0.1
Eucalyptus melanophloia	Silver-leaved Ironbark	0.2
Eucalyptus tereticornis	Blue Gum	0.2
Understorey		
Geijera parviflora	Wilga	0.1
Citrus glauca	Limebush	0.1
Eremophila mitchellii	False Sandalwood	0.2
Melaleuca bracteata	River Teatree	0.1
Callitris glaucophylla	Cypress Pine	0.3

Table 27: Current indicative species and sowing rates for native riparian habitat PMLU

Scientific name	Common name	Preliminary sowing rate (kg / ha)
Canopy		
Eucalyptus tereticornis	Blue Gum	0.2
Casuarina cunninghamiana	River Oak	0.1
Melaleuca trichostachya	Teatree	0.1
Angophora floribunda	Rough-barked Apple	0.3
Corymbia clarksoniana	Long-fruited Bloodwood	0.2
Eucalyptus populnea	Poplar Box	0.2
Eucalyptus melanophloia	Silver-leaved Ironbark	0.2
Understorey		
Eremophila mitchellii	False Sandalwood	0.2
Melaleuca bracteata	River Teatree	0.1
Callitris glaucophylla	Cypress Pine	0.3
Brachychiton populneus	Kurrajong	0.9
Groundcover		
Eragrostis lacunaria	Purple Lovegrass	1-2
Bothriochloa decipiens	Pitted Bluegrass	2-4
Aristida calycina	Dark Wiregrass	1-2

3.5.16 Water management

3.5.16.1 Water release and supply infrastructure

Water management infrastructure within the ML areas has been designed to ensure that separation is maintained between the undisturbed catchments and any potentially contaminated catchments. Water will be managed by utilising the natural topography of the landscape in combination with clean water diversion drains to separate catchments based on their likely water quality.

The water management system for the Project will include infrastructure for the controlled release of excess water off-site, if required, in accordance with Condition F, Table F4 of the Project EA. The outlet pipe will extend over, and beyond the bank of, Horse Creek to minimise the risk of erosion. The locations of the pipeline and release point will be designed to minimise potential impacts to environmental values.

In the event that any water storages were deemed to be complementary to the relevant PMLU, and the landholder requested its retention, then the storage may be retained under a suitable landholder agreement.

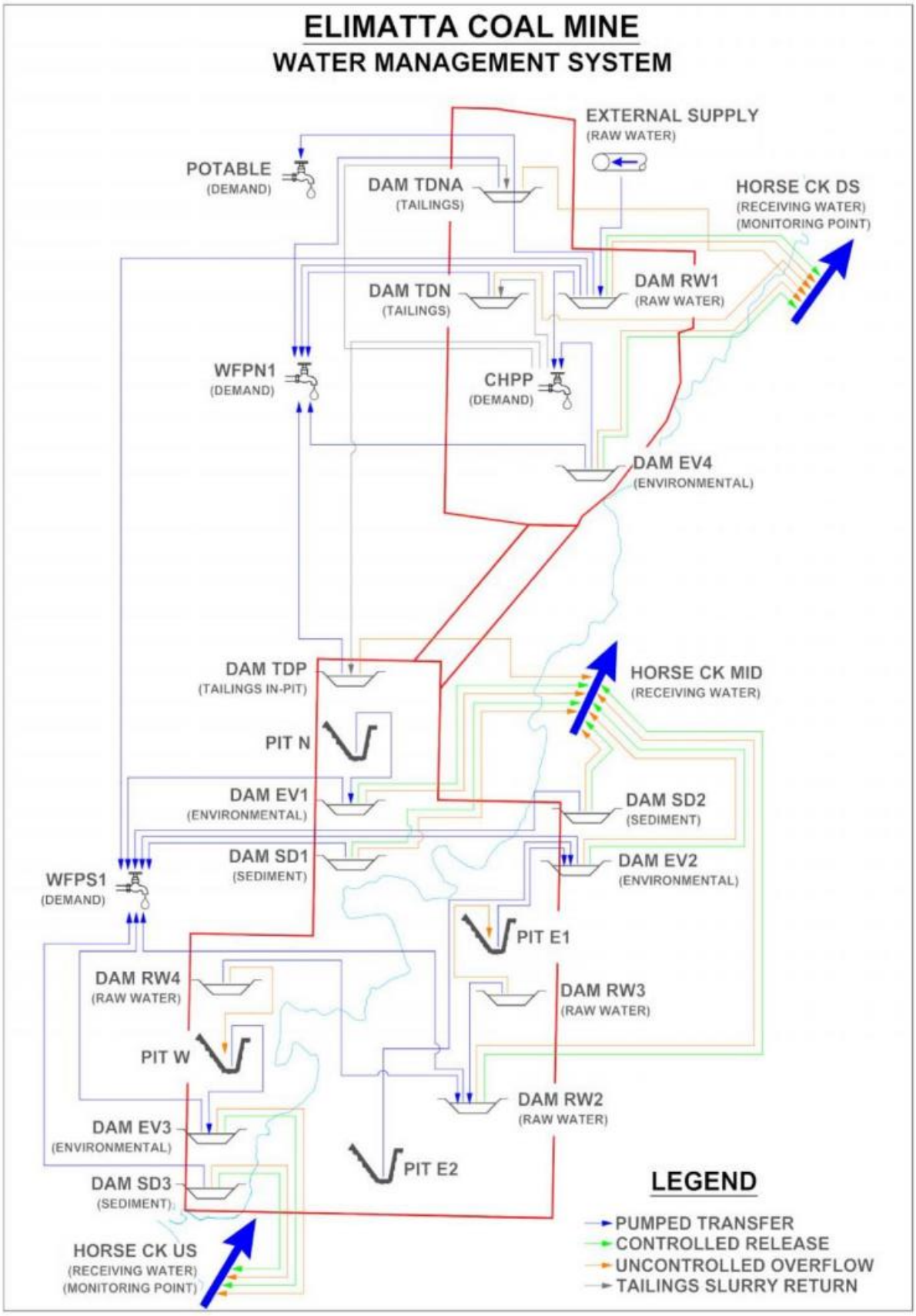

Figure 30: Schematic of site water management system

3.5.16.2 Water dams

All the Project's water storages are to be decommissioned and rehabilitated in accordance with their final PMLU. Stormwater dams will be drained into Horse Creek under, relevant release guidelines and criteria, and allowed to dry through evaporation prior to being re-contoured and original drainage paths restored, where practicable. The surface soils will then be topsoiled, ripped, and revegetated. Water management dams that contained potentially contaminated water during mining will be drained or allowed to evaporate. Contaminated material will be either removed from site or covered with benign rock material. A land contamination assessment will be undertaken for any hazardous dam sites.

Rehabilitation and treatment of water infrastructure will vary depending on the extent of disturbance or contamination present from mining activities. Where installed, dam liners will be removed and appropriately disposed of, and any contaminated soils will be treated and/or removed where necessary. Dams will be backfilled, reprofiled and seeded with a pasture seed mix suitable for grazing.

Table 28 describes the water storages proposed on site. Figure 31 and Figure 32 show the location of water storages in ML 50270.

Table 28: Project dams

Water storage	Maximum volume (ML)	Description	Regulated structure?	Retained on closure?
Environmental Dam (EV) 1[1]	50	Northern end of ML 50254 – receives pit water dewatered from northern pit	Yes[1]	No
EV2	600	North eastern end of ML 50254 – receives pit water dewatered from mine pits E1 and E2	Yes[1]	No
EV3	200	South western end of ML 50254 – received pit water dewatered from pit W	Yes[1]	No
EV4	380	5 smaller linked dams within southern end of ML 50270 – receives runoff from the MIA	Yes[1]	No
Sediment dam (SD) 1[1]	100	North eastern end of ML 50254 – prevent discharge to Horse Creek of sediment laden runoff from disturbed areas	No	No
SD2	400	North western end of ML 50254 – prevent discharge to Horse Creek of sediment laden runoff from disturbed areas	No	No
SD3	200	South western end of ML 50254 – prevent discharge to Horse Creek of sediment laden runoff from disturbed areas	No	No
Tailings Dam TDN	13,060	Mid portion of ML 50270 – receives fine tailings rejects output from the CHPP	Yes[1]	No
Tailings Dam TDNA	11,770	Northern portion of ML 50270 – receives fine tailings rejects output from the CHPP	Yes[1]	No
Tailings Dam Pit (TDP)	51,700	Northern portion of ML 50254 - receives fine tailings rejects output from the CHPP	Yes[1]	No
Raw Water Dam (RW) 1[1]	200	Northern end of 50270 – capture runoff from the local catchment	No	No
RW2	50	South eastern end of ML 50254 - capture runoff from the local catchment	No	No

Water storage	Maximum volume (ML)	Description	Regulated structure?	Retained on closure?
RW3	50	North eastern portion of ML 50254 - capture runoff from the local catchment	No	No
RW4	50	South western portion of ML 50254 - capture runoff from the local catchment	No	No

1 Due to the predicted high salinity (median Total Dissolved Solids >2,500 mg/L) of the water stored in the dam, this dam will be classified with a significant consequence category in accordance with the *Manual for assessing consequence categories and hydraulic performance of structures* (DERM 2016)

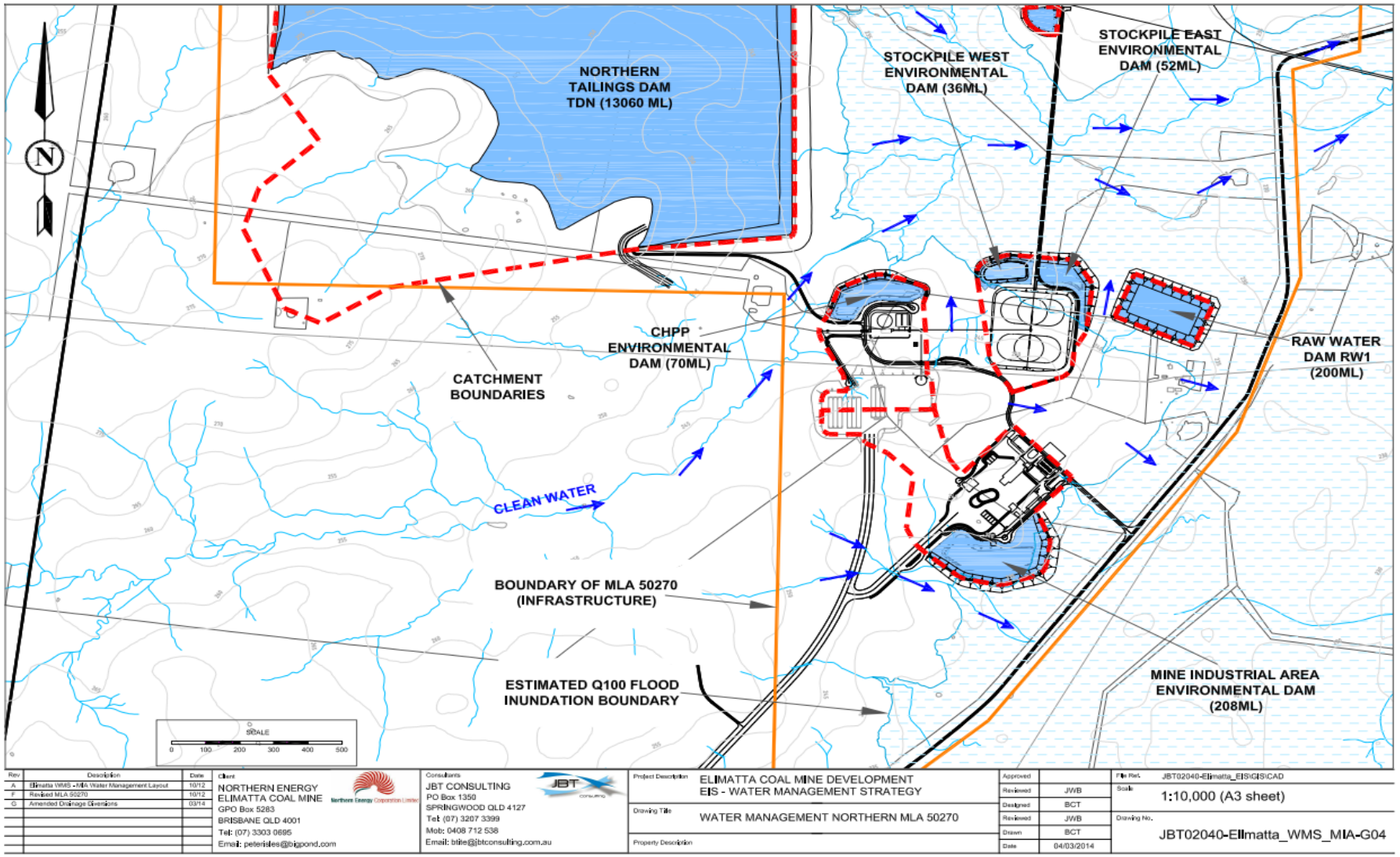

Figure 31: Mine infrastructure area water management (ML 50270)

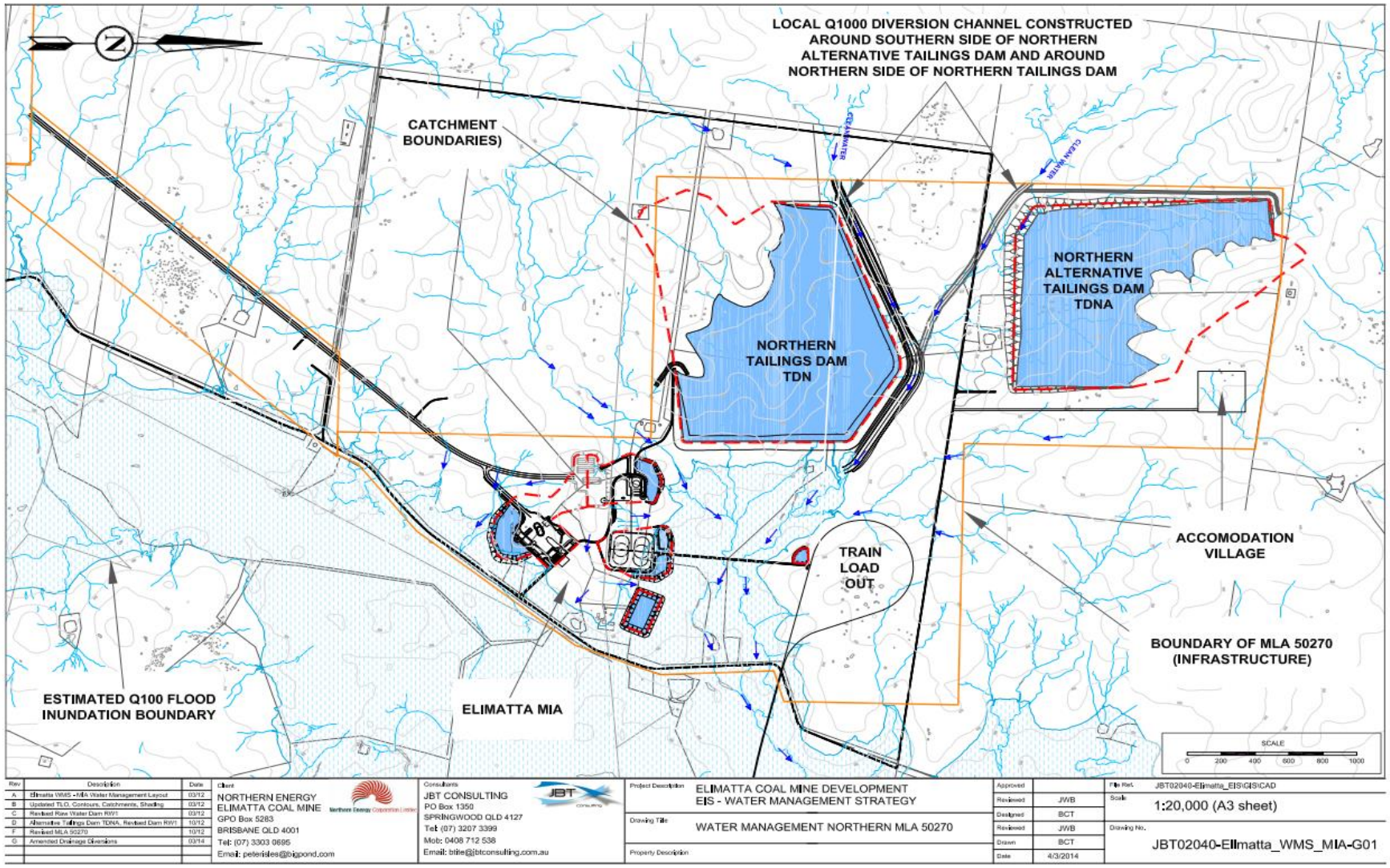

Figure 32: ML 50270 water management infrastructure

3.5.16.3 Diversions

The Project's planned diversion of Horse Creek within ML 50254 was designed in accordance with the *Draft Manual – Works that interfere with water in a watercourse: Watercourse diversions* (DNRM 2013). A comprehensive diversion proposal is documented in the Horse Creek Diversion Functional Design Report (Parsons Brinckerhoff 2014) (Appendix G).

Stage One involves an initial permanent diversion of the middle segment of Horse Creek with a temporary upstream and downstream link to the existing stream. The initial diversion in natural ground occurs in Year 0, prior to commencement of mining operations, and will be put into use in Year 1. This diversion is outside the pit and dump footprint but within the mining lease.

Stage Two involves a temporary diversion across a large meander loop upstream of Stage One to facilitate mining under the final upstream diversion footprint. The Stage Two diversion alignment follows a gently meandering planform through the existing alluvial floodplain, cutting off a significant meander bend in the existing Horse Creek thalweg. The diversion will entail the construction of a low flow channel only, with levees to the west to protect the active pits from flood inundation. Stage Two will be constructed in operational Year 2 of the Project.

The Stage Three diversion will be constructed to be operational in Year 4. The diversion will be excavated partially through natural ground, and partially through mine spoil. Stage Three forms part of the final diversion landform, and consists of an engineered floodplain through mine spoil, approximately 200 m wide, containing a meandering low flow channel, as well as a low flow channel constructed through the natural floodplain prior to re-connecting to Horse Creek at the downstream extent of the diversion.

Stage Four consists of a final permanent diversion on fill in the south, termed the permanent upstream diversion. It will be constructed in Year 5 of mining operations. It will be put into use in Year 10, thus having this period to stabilise before being opened to full flows. The complete diversion will have in excess of 15 years until the mine closes to refine the diversion structure to ensure it will be stable post-mining. Stage Four will be constructed to be operational in Year 5 of mining operations and will be constructed entirely through mine spoil. This section completes the final landform of the permanent diversion, which by this time incorporates Stage Four, part of Stages One and Three (Figure 33). The Stage Four diversion will comprise an engineered floodplain, approximately 200 m wide, containing a meandering low flow channel, and will incorporate a 100 m wide fill bund between the engineered floodplain and residual void location.

Due to the fact that diversions will be both temporary and permanent, revegetation outcomes and strategies have been tailored to meet varying operational requirements for each stage of the planned diversions and are described in the following sub-sections.

Temporary Diversions

The temporary diversions will be excavated as mining commences and are expected to be in place for up to 3 years. Therefore, the revegetation of these areas will focus on maintaining structural integrity of the diversions and minimising downstream impacts, which includes maintaining a stable landform, providing adequate groundcover to minimise erosion and sedimentation, minimising the spread of weeds and minimising impacts on water quality. The temporary diversions have been included within the relevant RA (section 3.5.2) and include the in-pit and ex-pit waste rock emplacements.

Revegetation of temporary diversions will involve the following actions.

- Mechanically ripping the subgrade of temporary diversion banks in preparation for topsoil application.
- Applying locally stripped topsoil at a minimum depth of 100 mm to minimise impacts of subsoil dispersion and to provide an effective growth medium for revegetation.
- Installing erosion control devices such as jute mesh and compost blankets on the more erosion prone areas of the diversions to minimise scouring. Jute mesh will be used on banks to stabilise the batters after the reapplication of topsoil. It will be installed and pinned as per the manufacturer's installation specifications. Compost blankets will be applied over the jute mesh to provide instant soil surface

protection, initiate soil micro-biological processes and help retain soil moisture, allowing for rapid vegetation establishment which is essential for stability.

- Planting of fast growing, hardy, deep rooted shrubs (e.g. Vetiver grass) to provide bank stabilisation.
- Direct seeding of grasses (e.g. Japanese millet, Couch), applied with a bonded fibre matrix hydromulch if required to form an effective groundcover.
- Managing weed infestations through control programs in response to annual monitoring.
- Minimising the spread of weeds from vehicles, machinery and imported fill.
- Establishing physical barriers around diversions to prevent livestock and vehicles from damaging revegetation areas.

Permanent Diversions

Following the establishment of the final landform of Horse Creek, the diverted creek will be initially revegetated with fast establishing exotic grass species (such as Japanese Millet or Couch) to provide short-term erosion protection and subsequently vegetated with local native grasses, sedges, shrubs and trees. The revegetation of permanent diversions will incorporate geomorphic and riparian vegetation features that are consistent with the pre-mining environment. A key objective for the revegetation of permanent diversions will be to ensure that self-sustaining vegetation communities are achieved. Additionally, revegetation along permanent diversions will aim to restore habitat connectivity with the remaining portions of Horse Creek.

In line with the objectives for permanent diversions, revegetation will involve:

- planting a diverse mix of native trees, shrubs and grasses;
- reinstating woody debris in the diverted landscape;
- weed management;
- ensuring revegetated areas are protected from the impacts of livestock grazing; and
- monitoring diversion stability and revegetation success for a period of at least 20 years to confirm revegetation objectives have been achieved prior to decommissioning of the mine.

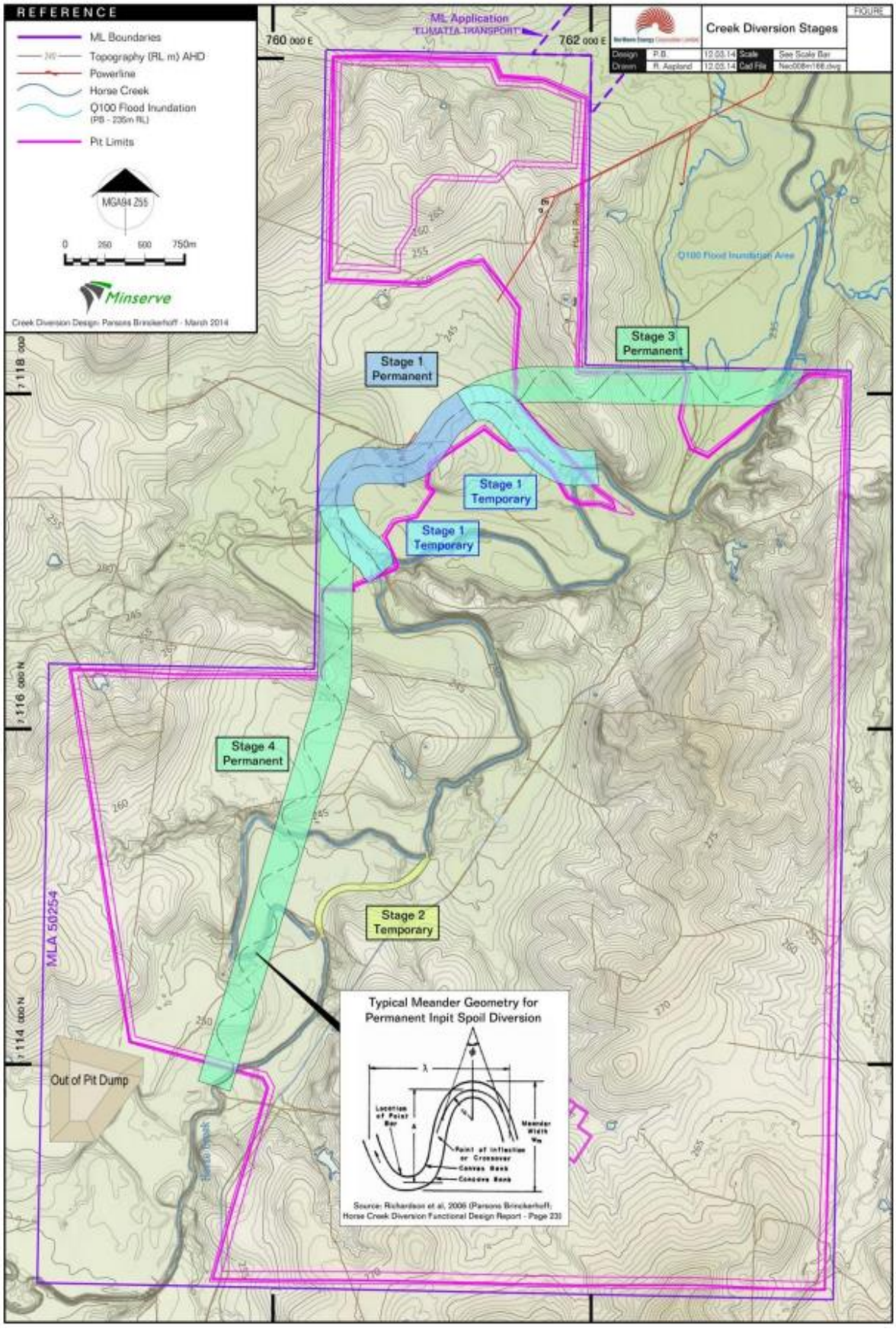

Figure 33: Horse Creek diversion

3.5.16.4 Flood levee

Several levees are expected to be in place throughout the life of mine and will be constructed as part of the diversion stages. At each stage of the Horse Creek diversion, levees are proposed to protect the mining areas within the southern ML (ML 50254) from inundation, including:

- three levees as part of the Stage 1 diversion to keep flood waters from inundating mine infrastructure on ML 50254 (Figure 34);
- an additional levee as part of the Stage 2 diversion, located on the western side of Horse Creek (Figure 35); and
- as part of the final diversion, a levee along the eastern side, southern side, and part of the western side of the south-western mining void to prevent inundation of flood water into the residual void (Figure 36).

Several of the flood protection levees proposed for the Project will be incorporated into the final landform and will provide flood protection to the post mining landform, including the residual void. Upon the completion of mining activities, the in-pit and out-of-pit waste rock emplacements will have been constructed up to and integrated with the flood protection levee, and therefore, these areas will become available for rehabilitation at the same time. The southern half of the retained flood levee, on the eastern side of the western void has not been included within the spoil dump rehabilitation areas. The permanent landform structure will provide probable maximum flood protection to the residual void and will be designed with a slope of ≤10° (17%).

Upon completion of the retained flood levee, it will undergo rapid revegetation (see section 3.5.15) to reduce any incidence of erosion and to increase rehabilitation success and landform stability. Similar to the permanent creek diversion, the levee will be monitored throughout the mine life with maintenance and repair works conducted as required. The permanent levee will be retained post mine closure to prevent flooding and inundation of the southwest residual void.

At closure, the levees will not be required to protect the final landform from flood water ingress, and therefore, will cease to be regulated structures. If the cross-sectional profile of the levee becomes an impediment to the operation of the NUMA or PMLU, works will be undertaken to reprofile the levee in whole or in part.

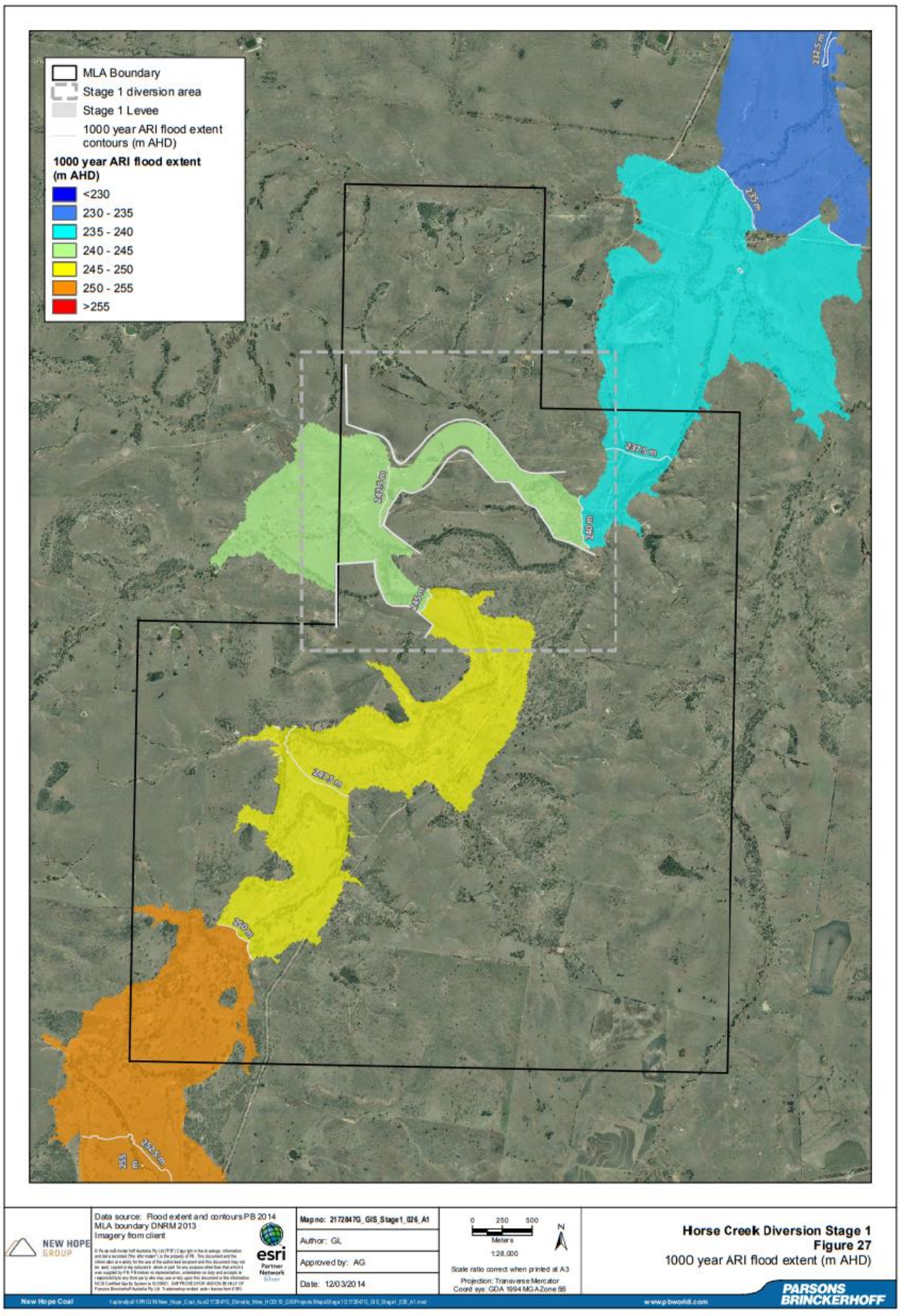

Figure 34: Horse Creek diversion (Stage 1) 1000-year ARI flood extent (mAHD)

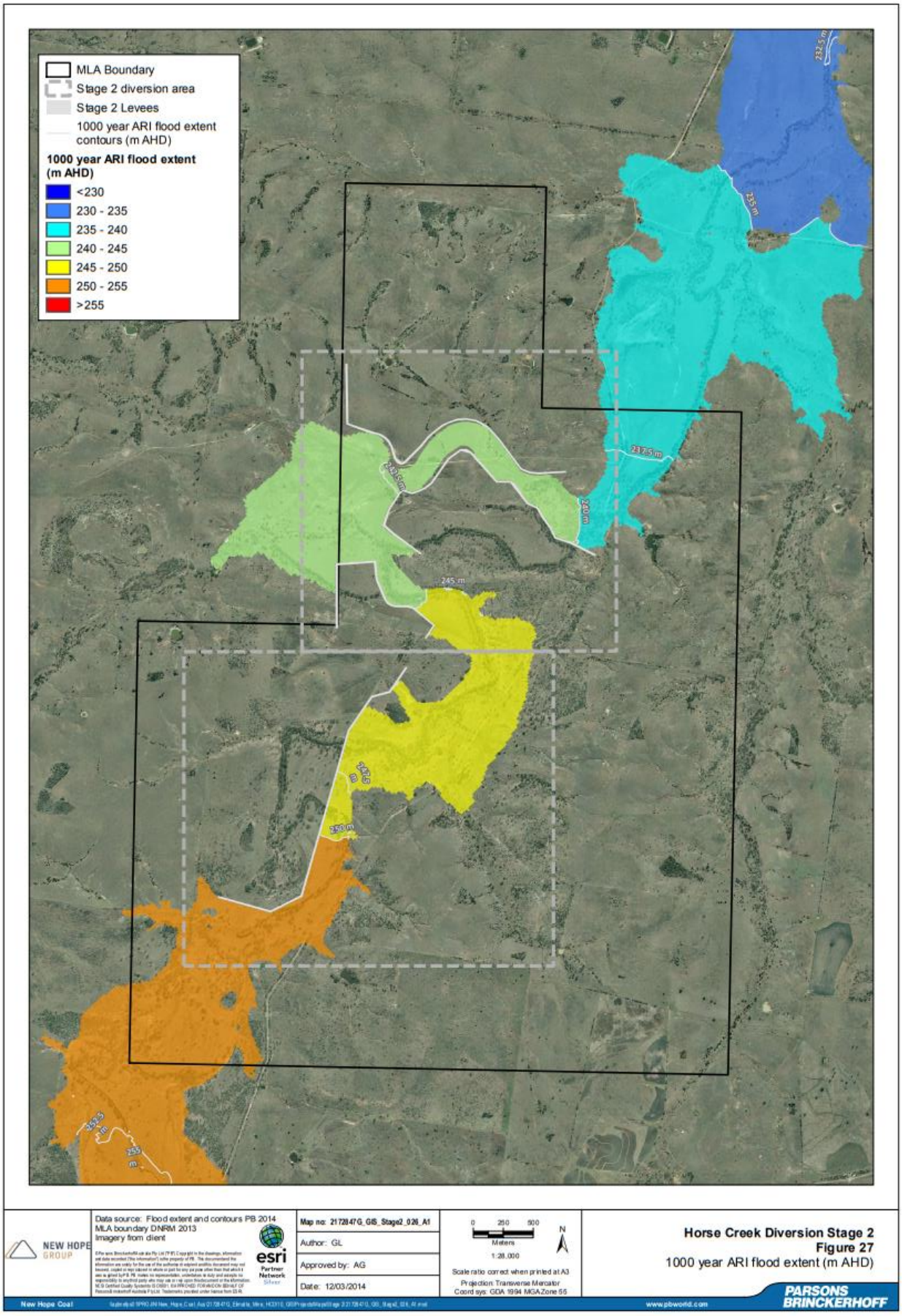

Figure 35: Horse Creek diversion (Stage 2) 1000-year ARI flood extent (mAHD)

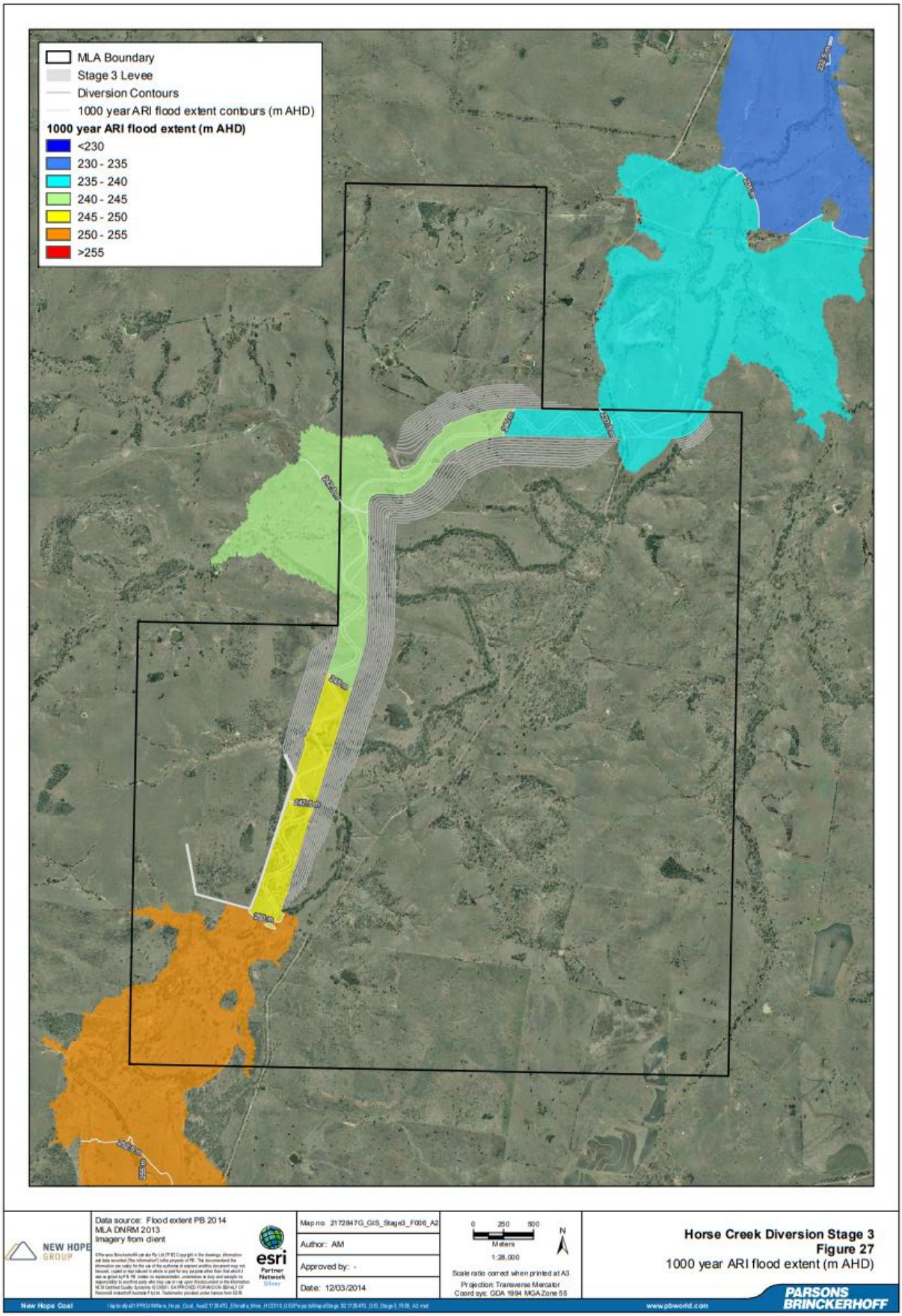

Figure 36: Horse Creek diversion (Stage 3) 1000-year ARI flood extent (mAHD)

3.6 Risk assessment

3.6.1 Risk assessment requirements

Section 126C(1)(f) of the EP Act requires the PRCP to identify the risks, for each PMLU, of a stable condition not being achieved and how the applicant intends to manage or minimise the risk.

A risk assessment has been carried out for the Project in accordance with the following standards:

- AS/NZS ISO 31000:2018 Risk management - Guidelines; and
- HB203:2012 Managing environment-related risk.

3.6.2 Risk assessment process

Any risk assessment needs to be undertaken with consideration of the scope, context and criteria relevant to the assessment. For this risk assessment, and as per the PRCP Guideline, the following scope and purpose was agreed to:

> *The purpose of this risk analysis is to identify the risks of a stable condition for land not being achieved for the agreed PMLUs nominated, and the approach to be taken by the Project to manage and minimise the risks identified.*

For this risk assessment, risk scenarios (or 'threats') were identified and considered for each rehabilitation area and non-use management area associated with the Project. The causes attributable to each risk scenario were documented as well as the potential impacts. Existing controls were noted, defined as those reasonably expected to be in place for a Project of this nature and having appropriate and contemporary management systems. Each risk scenario was then assessed with respect to health, safety, the environment, and compliance against the risk assessment schema outlined in section 3.6.3.

3.6.3 Risk assessment schema

Risks specific to the rehabilitation of the Project were classified using the risk classification schema which is described below. The risk assessment schema used is comparable to those used widely within the mining industry and comprises the following components:

- a control effectiveness ranking (Table 29) used for assessing the operational controls expected to be in place for a project of this type;
- a likelihood classification descriptors table (Table 30); and
- a consequence classification descriptors table (Table 31) intended to guide a consistent assessment of consequence.

Following a consensus determination of likelihood and consequence, the risk level was determined using the matrix shown in Table 32. For any risks classified as 'significant' or above, mitigation and management measures were identified and documented. Mitigation and management measures were also documented for some lower-level risks.

Table 29: Control effectiveness ranking

Control Rank	Description	Guidance
C1	Substantially effective/adequate design	Controls are considered adequately designed and are operating effectively on almost all occasions
C2	Mostly effective/adequate design	Controls are considered adequately designed and are operating effectively on most occasions
C3	Inadequate design/partially effective	Controls are considered inadequately designed or are only operating to partial effectiveness on most occasions
C4	No controls/ineffective	There are no controls designed or the existing controls are operating ineffectively on all occasions

Table 30: Likelihood of exposure to the hazard

Level of Risk Probability	Explanation
5 – Almost certain	Likely to occur in most circumstances multiple times in a year
4 – Likely	Will probably occur in most circumstances every 1-3 years
3 – Possible	Might occur at sometime over a 3-10 year period
2 – Unlikely	Could occur at sometime within a 10-50 year timeframe and has occurred in industry
1 – Rare	May only occur in exceptional circumstances within a 50-100 year timeframe

Table 31: Consequence classification descriptors

Impact types	Consequence Scale				
	Negligible (1)	Minor (2)	Moderate (3)	High (4)	Catastrophic (5)
Financial impacts (includes damage)	Less than $100,000	$100,000–$1 Million	$1–$10 Million	$10–$30 Million	Greater than $30 Million
Business interruption	Closure of a number of days (less than 1 week)	Closure 1–2 weeks	Closure 2–4 weeks	Closure 1–3 months	Permanent loss or closure of greater than 3 months
Capital Projects	Less than 2% budget or schedule overrun	2–5% budget or schedule overrun	5–10% budget or schedule overrun	10–15% budget or schedule overrun	Greater than 15% budget or schedule overrun. Failure to complete project
Reputation	Isolated complaints	Local community issue with limited stakeholder involvement	Local community issue with political involvement. Local media coverage	State/local community issue with key stakeholder attention. National media coverage	Withdrawal of Stakeholder support e.g. includes significant national or international media coverage
Legal / compliance	Breach of approval, permit, licence or legislation which is administrative. No regulatory action taken	Breach of approval, permit, licence or legislation with likely penalty less than $5,000 Civil settlement or court order less than $10,000	Breach of approval, permit, licence or legislation with likely penalty $5,000 to $10,000 Civil settlement or court order $10,001 to $100,000	Breach of approval, permit, licence or legislation with likely penalty $10,000 to $100,000 Civil settlement or court order $100,001 to $1 Million Prosecution of Personnel/Manager with potential criminal conviction Significant interruption to a site (e.g. temporary suspension of 'licence to operate' a site)	Breach of approval, permit, licence or legislation with likely penalty $100,000 or more Civil settlement or court order greater than $1 Million Prosecution of Directors/Officers with potential criminal conviction or jail. Loss of 'licence to operate' a site

Impact types	Consequence Scale				
	Negligible (1)	Minor (2)	Moderate (3)	High (4)	Catastrophic (5)
Health	Exposure to health hazard/agent (subjective symptoms) with potential to result in first aid treatment	Exposure to health hazard/agent reversible health impairment	Exposure to health hazard/agents (exceeding OEL) with the potential to result in days lost due to OII and/or PI >30%	Exposure to health hazard/agents (significantly exceeding OEL) with the potential to result in PI <30% or single fatality	Exposure to health hazard /agents (significantly exceeding OEL) with the potential to result in multiple single fatalities and/or PI <30% of more than 1 person
Safety	First Aid Injury Report Only included	Medical Treatment Injury or Restricted Work Injury	Lost Time Injury	Single fatality	Multiple fatalities
Environment	Nil to minor remediation (typically a shift). No adverse impact on environment	Near-source confined and short-term reversible impact (typically <week)	Near-source confined and temporary reversible impact (typically a month)	Impact that is unconfined and requiring long-term recovery, leaving residual damage (typically a year)	Impact that is widespread, unconfined and requiring long-term recovery, leaving major residual damage (typically years)

Note: Health impact definitions Used: Occupational Exposure Level (OEL); Occupational Injury/ Illness (OII); Permanent Impairment (PI)

Table 32: Risk level classification matrix

	Explanation		Risk rating				
			Negligible	**Minor**	**Moderate**	**High**	**Catastrophic**
Likelihood	Likely to occur in most circumstances multiple times in a year	Almost certain	M-5	H-10	H-15	E-20	E-25
	Will probably occur in most circumstances every 1–3 years	Likely	M-4	M-8	H-12	E-16	E-20
	Might occur at some time over a 3–10-year period	Possible	L-3	M-6	H-9	H-12	H-15
	Could occur at sometime within a 10–50-year timeframe and has occurred in industry	Unlikely	L-2	M-4	M-6	M-8	H-10
	May only occur in exceptional circumstances within a fifty-to-hundred-year timeframe	**Rare**	L-1	L-2	L-3	M-4	M-5

3.6.4 Risk assessment outcomes and management

Detailed risk assessment outcomes are provided in Appendix H. For the Project, a total of 79 individual risk scenarios were identified resulting in:

- no risk scenarios classified as ‘extreme’;
- 11 risk scenarios classified as ‘high’;
- 62 risk scenarios classified as ‘medium’; and
- 6 risk scenarios classified as ‘low’.

A summary of risk outcomes is shown in Table 33.

The 11 ‘high’ risks identified from the risk assessment can be grouped into the following categories:

- geotechnical risks;
- erosional risks;
- non-polluting risks; and
- achievement of a sustainable PMLU.

The 62 ‘moderate’ risks identified span the same categories as the ‘high’ risk group, but add the following two categories:

- safety risks; and
- geochemical risks.

Table 33: Risk assessment outcomes by rehabilitation and management area

Domains	Risk level				
	Low	Moderate	High	Extreme	Total
Rehabilitation areas					
In-pit and out-of-pit spoil dumps	0	10	3	0	**13**
Waste disposal (including capped TSFs)	0	10	2	0	**12**
Rehabilitated water management structures	0	9	0	0	**9**
In-pit TSF (TDP) rehabilitated	0	9	3	0	**12**
Mine infrastructure and exploration area	0	10	0	0	**10**
Creek diversions (permanent)	0	5	1	0	**6**
Retained flood levees	1	7	2	0	**10**
Improvement areas					
Residual voids	5	2	0	0	**7**
Total	6	62	11	0	**79**

Safety risks

The safety risks identified relate to surface roughness and slope steepness in excess of that expected for the PMLU, residual void access and failure of retained flood levees. The risks to safety have been addressed within the milestone criteria (see Table 15 and Table 19). The PMLU landform design will be consistent with geotechnical design criteria and will be monitored as discussed in section 3.7. Safety risks in relation to residual void access have also been controlled and monitoring will be conducted to determine long-term safety from the proposed bunding, fencing and signage.

Geotechnical risks

Several final landforms pose geotechnical risks and include the spoil dumps, surface TSFs (TDN and TDNA), in-pit TSFs (TDP), and the retained flood levees. The slopes will be consistent with the geotechnical design criteria described in sections 3.5.9 to 3.5.11 and will be assessed by a suitably qualified person upon completion or mine closure.

Erosional risks

Erosional risks have been identified within all PMLUs including the potential for gully, pipe and/or sheet erosion of rehabilitated areas. The final landform design discussed in section 3.5.7 considers the potential for erosional risks. The erosional stability of rehabilitated landforms will be assessed through rehabilitation monitoring data. Long-term bank stability of the permanent creek diversion is to be achieved through the establishment of riparian vegetation. Proposed management and monitoring measures that relate to erosion are described in section 3.7.

Non-polluting and geochemical risks

The potential for environmental harm arising from contaminants leaving the site relates to the potential for total suspended solids drainage and consequent downstream water quality impacts (including sedimentation) and the potential for contaminant impacted lands. The geochemical risks relate to the potential for acid and saline drainage, and seepage and runoff of contaminated materials into surface waters and groundwater.

These risks were determined as unlikely to occur based on available hydrological modelling, the control measures proposed, and the findings of geochemical assessments into waste rock and tailings materials (refer section 3.5.6.2). The moderate risk rating was due to the 'moderate' or 'high' environmental consequence associated. A water quality monitoring program, land contamination assessment, and remediation activities where necessary, will be required to meet the milestone criteria proposed (refer Table 15 and Table 19).

The risk of achieving a sustainable PMLU

The predominant final land use for the Project is low intensity cattle grazing. The risk of failing to achieve this as a sustainable PMLU is related primarily to the risk of insufficient topsoil resources to allow effective rehabilitation to occur; and consequently, insufficient pasture productivity and/or infestation of weeds. The risk associated with this risk category is considered to be inversely proportional to the length of time allowed to meet milestone criteria.

To minimise this risk, testing and amelioration of soils will occur at placement and before revegetation works occur (see section 3.5.15). Seed mixes have been developed specifically for the Project and the PMLU with a view to maximising rehabilitation success. Ongoing maintenance and monitoring, as well as weed control, will be undertaken (refer section 3.7). Milestone criteria have been developed relevant to this risk.

The risk of insufficient topsoil resources to complete rehabilitation is considered a moderate risk able to be managed. Controls to be implemented include a topsoil management regime requiring regular updates to the life of mine topsoil balance and regular *in situ* testing of materials to ensure suitability for use.

3.7 Monitoring and maintenance

3.7.1 Rehabilitation monitoring

With respect to determining the achievement of the Project's rehabilitation milestones, criteria have been defined for each rehabilitation milestone. Assessment of rehabilitation against milestone criteria will be a key objective of ongoing environmental monitoring undertaken for the Project. When the final rehabilitation milestone applicable to the rehabilitation area is deemed to be satisfied, a final rehabilitation assessment will be undertaken before an application for either progressive certification or an ML surrender application is made.

A detailed Rehabilitation Monitoring Plan has been developed for the Project is included in Appendix F.

3.7.1.1 Rehabilitation monitoring frequency and coverage

Rehabilitation will be monitored at a frequency appropriate to the stage that rehabilitation is at, generally with the survey period occurring post wet season, as monitoring at this time allows for more accurate identification of the species present and a clearer understanding of species richness on-site.

The rehabilitation monitoring program will be reviewed to ensure that data collection is achieved at sufficient spatial and temporal resolution to ensure statistically valid results.

3.7.1.2 Relevant rehabilitation monitoring aspects

The following methods are employed at each monitoring site and described in the following sections:

- permanent vegetation monitoring transects (ground cover monitoring and species richness);
- photographic monitoring;
- erosion monitoring; and
- topsoil characterisation (every 2–3 years).

In conjunction with walking between transects, rehabilitation areas will be visually assessed to identify signs of fauna utilisation, noticeable issues such as erosion, vegetation cover deficiencies, or weed and / or pest infestations. Satellite imagery technology may also be employed. These observations are incorporated with the results of each rehabilitation progress report.

Permanent vegetation monitoring transects

Vegetation monitoring will be conducted in accordance with the Rehabilitation Monitoring Plan (Appendix F). Permanent vegetation monitoring will include the collection of quantitative data on ground cover, species richness, and tree and shrub density within each plot at monitoring sites.

To measure species richness, all vascular plants occurring within 5 m of either side of a 50 m transect are recorded. Any species unable to be identified are collected for later identification. Percentage ground foliage cover for each species is recorded within ten 1 m x 1 m quadrats placed every 5 m along a 50 m transect. In each quadrat, the percentage cover of rock, bare ground, organic litter, and each plant species present is recorded. Species are classified into one of the following six groups for reporting purposes:

- native pasture species;
- exotic pasture species;
- trees;
- shrubs;
- forbs; and
- noxious weeds.

This methodology is used to record species richness and the projective foliage cover on the transects to assess against milestone criteria. It should be noted that due to the pastoral nature of rehabilitation sites, the projective foliage cover is inferred from the vegetation cover measured at each transect.

The above methodology has been adapted based on information contained within the *BioCondition Assessment Framework* (Eyre et al. 2015), the *Vegetation Assessment Guide* (DoE 2013), and the *Methodology for Survey and Mapping of Regional Ecosystems and Vegetation Communities in Queensland* (Neldner et al. 2022).

Recruitment monitoring

Recruitment will be assessed using the methodology adapted from Eyre *et al*. (2015), whereby recruitment is assessed over the 10 m x 50 m plot (5 m either side of each 50 m transect). Within this plot, the proportion of dominant species found to be regenerating are counted. A regenerating individual is identified as a woody stem species at breast height, with a diameter of <5 cm. For each dominant canopy species present, at least one individual must be present as a sapling or seedling for the species to be considered as regenerating. The presence of all dominant species in the regenerative state would make up 100% recruitment

Photographic monitoring

Photographic monitoring at monitoring sites provides a visual comparison over time of the vegetation, ground cover, erosion, and general appearance of each monitoring site.

Fauna observations

Observations of any fauna species or indicators of fauna presence (e.g., scats, tracks, or other signs of fauna activity) within or in the vicinity of the rehabilitation areas will be noted as part of rehabilitation monitoring.

Erosion monitoring

An erosion monitoring methodology has been developed with consideration to relevant guidelines, research, and experience (The National Committee on Soil and Terrain 2009; Eyre *et al*. 2017 and DSITI 2015). Erosion monitoring will be conducted across all reference and rehabilitation monitoring locations. Rehabilitation areas will be inspected to assess the extent of erosion features and an erosion rating for each site will be determined. Erosion features or indicators may include wind or sheet erosion, erosion rills, gullies or tunnels, or signs of slumping. There is no consensus in Australia on quantitative definitions for minor, moderate, severe, or extreme erosion. The classifications used have been adapted from the Australian Soil and Land Survey Field Handbook (The National Committee on Soil and Terrain 2009).

Erosion at survey sites is monitored through visual assessment over time. Assessment is undertaken by traversing the 50 m transects and recording the number and maximum depth of any erosion features or rill lines. Obvious cases of localised settlement which are not causing any subsequent erosion are not considered instances of erosion. Erosion is considered to be stable when it is classified as minor. Some erosion is expected in the first years due to an absence of vegetation and the frequency and severity of storm events. Therefore, erosion stability will be assessed following seeding/planting. Monitoring will commence in the first year and the first three years will represent landform establishment. In year four, the transects will be traversed by two independent recorders on the same day, recording the location, depth, and number of rills/gullies. The variation in assessment between independent observers will describe the acceptable range of 'no change' in erosion over time.

See Appendix F (Rehabilitation Monitoring Plan) for further details on erosion monitoring and criteria.

Topsoil characterisation

Topsoil sampling is not considered to be an annual requirement of the rehabilitation monitoring program. However, it is to be undertaken approximately every 2–3 years to monitor development of the soil profile or to address any deficiencies in the chemical composition of the soil that may be detrimental to vegetation health.

Topsoil data collected as part of the monitoring program will ultimately be compiled into a land suitability assessment of the rehabilitated land.

3.7.1.3 Surface water monitoring

Surface water quality monitoring for the Project will be undertaken to meet the water quality objectives for Horse Creek developed for the Project. Monitoring will be undertaken at background (control) sites located upstream of the Project on Horse Creek. These sites are located outside the immediate zone of influence from the Project. Monitoring will also be undertaken at impact sites located downstream from the Project and within the potential zone of influence including downstream locations at Horse Creek and Nine Mile Creek. Proposed water monitoring locations are presented in Table 34.

Table 34: Proposed surface water quality monitoring locations

Monitoring points	Receiving waters location description	Latitude (decimal degree, GDA 94)	Longitude (decimal degree, GDA 94)
Upstream background monitoring points			

Monitoring points	Receiving waters location description	Latitude (decimal degree, GDA 94)	Longitude (decimal degree, GDA 94)
SM1	Horse Creek	S26.081944	E149.591384
SM2	Horse Creek	S26.041388	E149.6
SM4	Horse Creek	S25.996388	E149.641112
Downstream monitoring points			
SM3	Horse Creek	S26.031943	E149.629730
SM5	Horse Creek	S25.980557	E149.651657
SM6	Nine Mile Creek	S25.974443	E149.651108

Additional or alternative monitoring locations (e.g. other water storages on-site and/or surrounding environmental features) will be developed as part of site-specific plans as required.

Water quality monitoring will be undertaken using a combination of laboratory and *in situ* sampling by trained personnel and in accordance with the Queensland 'Monitoring and Sampling Manual' (DES 2018). Proposed water quality parameters to be sampled are summarised in Table 35.

Table 35: Proposed water quality indicators

Monitoring Category	Indictor
Physiochemical	• pH • Salinity (EC, Total Dissolved Solids) • Turbidity • Sulphate • Dissolved Oxygen • Total Suspended Solids • Colour
Biological	• Chlorophyll • Cryptosporidium • Blue-green Algae • Algal toxin
Toxicant	• Metals and Metalloids (As, Al, Ag, B, Ba, Be, Cd, Co, Cr, Cu, F, Fe, Hg, Li, Mo, Mg, P, Pb, Pd, Ni, Se, U, V, Zn) • Fluoride • Sodium • Carbonate, Hardness • Nitrogen (Ammonia, Nitrate/Nitrite, Total Organic Nitrogen) • Total Recoverable Hydrocarbons and Total Petroleum Hydrocarbons

3.7.1.4 Groundwater monitoring

Groundwater quality monitoring will be undertaken biannually and will be compared with reference groundwater data. Groundwater monitoring will be undertaken by a competent person and will be in accordance with the latest edition of the administering authority's water quality sampling manual.

It should be noted that the groundwater monitoring network has not been finalised for the Project. An Associated Water License (AWL) is still required for the Project and the groundwater monitoring locations will be determined and submitted to the relevant state government department for approval.

3.7.1.5 Pasture productivity

An assessment of pasture productivity will be undertaken to determine the achievement of the target PMLU. Pasture productivity within rehabilitated areas will be assessed using either manual measurements or satellite imagery. Measurements for pasture productivity should be undertaken at the end of the growing season. Manual measurements of pasture productivity will be undertaken in accordance with relevant industry guidelines.

3.7.1.6 Residual voids

Residual void monitoring will be undertaken to assist in determining the achievement of a final landform consistent with a NUMA. A suite of water quality samples will be taken quarterly as the void fills for a period of 25 years. It is expected that as research progresses, sampling measures and parameters may change (Blanchette and Lund 2021).

Residual void water quality monitoring

Monitoring of water quality parameters in the void will provide an indication of any unpredicted acid mine drainage (in addition to surface water monitoring) and salinity levels that may affect the surrounding environment.

Water quality analysis methods have been adapted from Blanchette and Lund (2021). A combination of *in situ* and laboratory analysis will be undertaken of residual void water from both the bottom (approximately 0.5 m above the bottom surface sediments) and the surface. Sampling will be conducted by boat.

In situ water parameters including depth, pH dissolved oxygen, electrical conductivity, oxidation-reduction potential, turbidity, and chlorophyll will be sampled at a minimum of three locations across the void from the bottom and surface of water.

Water samples for water quality (one sample) and microbe analysis/phytoplankton identification (one sample) will be collected at the location of the *in-situ* measurements and will be collected using the appropriate equipment for the site (e.g., hand, pump, Kemmerer bottle). Water quality samples will be sent to the laboratory for analysis of pH, electrical conductivity, total dissolved solids, major ions, metals, and metalloids. Microbes will be collected, and laboratory DNA analysis will be utilised for identification purposes. Phytoplankton will be collected and identified in the laboratory to the genus level.

Once water levels exceed 5 m, stratification data can be collected. Measurements of water levels, light, temperature, conductivity, and dissolved oxygen will be undertaken at the deepest water point using data logger technology.

3.7.2 Rehabilitation maintenance

Two types of rehabilitation maintenance will be carried out in rehabilitated areas: progressive maintenance and failure mitigation maintenance. Progressive maintenance is planned and involves repairs after initial construction processes have been completed.

Failure mitigation maintenance will be carried out when the rehabilitated areas are not achieving the rehabilitation objectives. The overall aim of the monitoring and maintenance program is to identify any issues that may result in large scale failure of the rehabilitation goals and objectives.

Maintenance of rehabilitated areas will be required for a number of years after the mine has been decommissioned. Annual rehabilitation monitoring will identify rehabilitation areas that are failing. Rehabilitation maintenance will then be applied as required, and may include the following:

- replanting / reseeding of unsuccessful areas;
- ongoing implementation of the pest and weed management plan;
- fertiliser application;
- gypsum application; and
- erosion maintenance.

Table 36: Rehabilitation milestone management and monitoring measures

Rehabilitation milestone	Description / criteria	Proposed management / monitoring measure(s)
RM1: Infrastructure decommissioning and removal	Applicable to all infrastructure identified to be decommissioned/ removed from site. Considered to be met when the area can be transitioned to the next milestone.	Infrastructure decommissioned/ removed at closure will be subject to strict environment and safety planning requirements including completion inspections. A visual inspection(s) will be conducted to determine that no infrastructure remains that does not form part of a Landholder Agreement.
RM2: Management of contaminated land status	Applicable to the waste rock dump area, mine infrastructure areas, and the tailings dam area (i.e. where notifiable activities have been carried out) and, at a minimum, involves the completion of a Phase 1 contaminated land investigation undertaken by an appropriately qualified person. Considered to be met when contaminated material has been placed removed from site, or remediated *in situ*, a validation report has been completed, and, if required, a site suitability statement has been prepared. Where required, remediation activities will be undertaken and recorded, and notifications completed.	A completed Phase 1 contaminated land investigation report, as well as any consequent reports where required. Visual inspection of potential sites or sources of contaminated material will be conducted, and samples collected as required. The contaminated land investigation will determine the presence of any contaminants. Remediation activities will be undertaken if required following consultation on appropriate remediation activities. A validation report will detail the remediation of contaminated land and, if required, a site suitability statement prepared by an appropriately qualified person that states that the land is suitable for use according to the nominated PMLU.
RM3: Landform development (re-profiling / re shaping) of land affected by disturbance	Applicable to all areas where bulk earthworks and other grading are required to achieve target landform shape and drainage characteristics. Considered to be met when graded banks are installed on waste rock dumps, final landform water storages are cleared and natural drainage is established and all other applicable disturbance areas have been reprofiled to suit the surrounding landform. Additionally, a geotechnical assessment will be conducted to confirm that long-term geotechnical stability has been achieved.	Land based and/or remote sensing survey techniques will be employed to confirm that graded slopes meet design specifications. Additionally, visual inspections will be done to determine if any future maintenance/repair action is required. A geotechnical assessment will be conducted by an appropriately qualified person to confirm that long-term stability has been achieved for all relevant landforms.
RM4: Capping	Applicable to all TSFs and required to achieve target landform shape and drainage characteristics and demonstrate geotechnical stability.	Survey and geotechnical assessment by an appropriately qualified person of completed areas.

Rehabilitation milestone	Description / criteria	Proposed management / monitoring measure(s)
RM5: Surface preparation (topdressing, contour ripping, soil amelioration)	Applicable to all areas requiring revegetation. Includes final profiling and application of topsoil materials, soil testing, and soil amelioration. Considered to be met when surface preparation activities have been completed and soil condition is conducive to plant germination and growth.	A soil assessment will be conducted by an appropriately qualified person prior to each rehabilitation event to determine soil suitability, and recommendations made for ameliorants where required. Records of topsoil placement indicating achievement of a target depth of the ≥ 0.3 m. Records to include any ameliorants applied, including types, rates and timing of applications. Visual inspections and documentation of contour ripping, including depth, spacing and machinery used.
RM6: Grazing revegetation (seeding and / or planting)	Applicable to all areas requiring revegetation. Includes seeding and/or planting of target revegetation species. Considered to be met when records demonstrate that seeding and/or planting of target species has been completed, with the understanding that remedial works such as reseeding or infill planting may be necessary to meet target vegetation completion criteria.	Survey of completed areas, and record of revegetation method retained. Records of seeded and/or planted species consistent with the species listed in Table 25: Current indicative species and sowing rates for low intensity grazing PMLU.
RM7: Riparian habitat (native vegetation) revegetation (seeding and / or planting)	Applicable to all areas requiring revegetation. Includes seeding and/or planting of target revegetation species. Considered to be met when records demonstrate that seeding and/or planting of target species has been completed, with the understanding that remedial works such as reseeding or infill planting may be necessary to meet target vegetation completion criteria.	Survey of completed areas, and record of revegetation method retained. Records of seeded and/or planted species consistent with the species listed in Table 27: Current indicative species and sowing rates for native riparian habitat PMLU.
RM8: Achievement of grazing PMLU to stable condition	Final milestone applicable to all rehabilitated areas (excluding RA7). Involves monitoring and remediation works if monitoring identifies risks to the final rehabilitation criteria being achieved. Considered to be met when all completion criteria have been achieved and land is safe, stable, does not cause environmental harm and can sustain the nominated PMLU.	A Hazard and Safety Assessment will be undertaken by an appropriately qualified person. Recommendations for remedial works will be made where required, and remedial activities undertaken as soon as practicable.

Rehabilitation milestone	Description / criteria	Proposed management / monitoring measure(s)
RM9: Achievement of native vegetation PMLU to stable condition	Final milestone applicable to RA7. Involves monitoring and remediation works if monitoring identifies risks to the final rehabilitation criteria being achieved. Considered to be met when all completion criteria have been achieved and land is safe, stable, does not cause environmental harm and can sustain the nominated PMLU.	A Hazard and Safety Assessment will be undertaken by an appropriately qualified person. Recommendations for remedial works will be made where required, and remedial activities undertaken as soon as practicable.
RM10: Achievement of target pasture productivity criteria for grazing PMLU	Rehabilitated areas to be assessed against all completion criteria developed with reference to analogue sites of similar characteristics and land use. Considered to be met when land can be transitioned to progressive certification.	Field surveys, drone and satellite data analysis as part of the annual rehabilitation monitoring.
RM11: Achievement of native vegetation PMLU to a sustainable condition	Rehabilitated areas to be assessed against all completion criteria developed with reference to analogue sites of similar characteristics and land use. Considered to be met when land can be transitioned to progressive certification.	Field surveys, drone and satellite data analysis as part of the annual rehabilitation monitoring.
RM12: Achievement of retained infrastructure PMLU to stable condition	Final milestone applicable to all areas nominated as retained infrastructure. Involves monitoring and remediation works if monitoring identifies risks to the final rehabilitation criteria being achieved. Considered to be met when all completion criteria have been achieved and land is safe, stable, does not cause environmental harm and can sustain the nominated PMLU.	A Hazard and Safety Assessment will be undertaken by an appropriately qualified person, and a final landform survey will be undertaken to confirm that retained infrastructure forms part of a landholder agreement. Recommendations for remedial works will be made where required, and remedial activities undertaken as soon as practicable.

Table 37: Management milestone management and monitoring measures

Management milestone	Description / criteria	Proposed management / monitoring measure(s)
MM1 - Achievement of final landform design	Improvement areas to be assessed against the landform design completion criteria developed for voids (refer section 3.5.11.1). Considered to be met when void batter slopes are within target slope range and confirmation that voids act as groundwater sinks.	Geotechnical modelling and hydrogeological survey of completed areas by suitably qualified persons.
MM2 - Achievement of surface and safety requirements	Bunding and safety warning signage erected around perimeter of each void. Considered to be met when voids are inaccessible	Survey around perimeter of all voids.
MM3 - Achievement of sufficient improvement	Bunding and safety warning signage erected around perimeter of each void. Considered to be met when voids are inaccessible and improvement areas will not cause environmental harm.	Survey of completed areas and water quality testing shows that voids will not cause environmental harm.

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Appendix A. PRCP Schedule

Post-mining land uses (PMLU)										
Rehabilitation area	RA1									
Relevant activities	Creek Diversion									
Total rehabilitation area size (ha)	143 ha									
Commencement of first milestone: RM1	10/12/XXXX* + year**									
PMLU	Low intensity cattle grazing (native riparian vegetation)									
Date area is available	Year 2	Year 7								
Cumulative area available (ha)	35	143								
Milestone completed by	Year 7	Year 10	Year 15	Year 20	Year 21					
Milestone Reference	**Cumulative area achieved (ha)**									
RM1	35	143								
RM3	35	143								
RM5	35	143								
RM7	35	35	143							
RM9			35	143						
RM11				35	143					

* XXXX is the year of commencement of the Project and is defined as the date of first topsoil stripping

** the year refers to the year at which the land will become available after commencement of the Project and will be added to the commencement year to define the date at which land is available for rehabilitation

1) Insert new columns to the yellow table to include further rehabilitation milestone dates.
2) Insert new columns to the blue table to match rehabilitation milestone dates.
3) Insert new rows to the blue table to include additional rehabilitation milestone references.
4) Insert the relevant number in the "Milestone reference" column (i.e. RM1).

Post-mining land uses (PMLU)										
Rehabilitation area	RA2a									
Relevant activities	Water Management Infrastructure (Environmental, Sediment, Raw water dams)									
Total rehabilitation area size (ha)	46 ha									
Commencement of first milestone: RM1	10/12/XXXX* + year**									
PMLU	Low intensity cattle grazing									
Date area is available	Year 10	Year 15	Year 20	Year 25	Year 30					
Cumulative area available (ha)	2.3				46					
Milestone completed by	Year 15	Year 20	Year 25	Year 30	Year 35	Year 40	Year 45			
Milestone Reference	**Cumulative area achieved (ha)**									
RM1	2.3				46					
RM2	2.3				46					
RM3	2.3				46					
RM6		2.3				46				
RM8		2.3					46			
RM10			2.3				46			

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Post-mining land uses (PMLU)										
Rehabilitation area	RA2b									
Relevant activities	Water Management Infrastructure (Flood Levee)									
Total rehabilitation area size (ha)	7 ha									
Commencement of first milestone: RM1	10/12/XXXX* + year**									
PMLU	Low intensity cattle grazing (modified pasture)									
Date area is available	Year 7	Year 10	Year 15	Year 20						
Cumulative area available (ha)	0.2			7						
Milestone completed by	Year 10	Year 15	Year 20	Year 25	Year 30	Year 35				
Milestone Reference	**Cumulative area achieved (ha)**									
RM1	0.2			7						
RM3	0.2			7						
RM5	0.2			7						
RM6		0.2		7						
RM8			0.2		7					
RM10				0.2		7				

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Post-mining land uses (PMLU)										
Rehabilitation area	RA3									
Relevant activities	Mine Infrastructure Areas									
Total rehabilitation area size (ha)	132 ha									
Commencement of first milestone: RM1	10/12/XXXX* + year**									
PMLU	Low intensity cattle grazing (modified pasture)									
Date area is available	Year 32	Year 35	Year 40	Year 45	Year 52					
Cumulative area available (ha)	75 ha				132					
Milestone completed by	Year 35	Year 40	Year 45	Year 52	Year 55	Year 60	Year 65	Year 70		
Milestone Reference	**Cumulative area achieved (ha)**									
RM1	75				125					
RM2	75				125					
RM3	75				125					
RM5		75				125				
RM6		75				125				
RM8			75				125			
RM10				75				125		

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Post-mining land uses (PMLU)										
Rehabilitation area	RA4									
Relevant activities	Waste Disposal (Surface and in-pit TSFs)									
Total rehabilitation area size (ha)	416 ha									
Commencement of first milestone: RM1	10/12/XXXX* + year**									
PMLU	Low intensity cattle grazing (modified pasture)									
Date area is available	Year 11	Year 15	Year 20	Year 25	Year 30	Year 36				
Cumulative area available (ha)	145	272				416				
Milestone completed by	Year 15	Year 20	Year 25	Year 30	Year 36	Year 40	Year 45	Year 50	Year 55	
Milestone Reference	**Cumulative area achieved (ha)**									
RM1	145	272				416				
RM2	145	272				416				
RM3	145	272				416				
RM4		272				416				
RM5		272					416			
RM6		145	272				416			
RM8			145	272				416		
RM10				145	272				416	

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** the year refers to the year at which the land will become available after commencement of the Project and will be added to the commencement year to define the date at which land is available for rehabilitation

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3) Insert new rows to the blue table to include additional rehabilitation milestone references.
4) Insert the relevant number in the "Milestone reference" column (i.e. RM1).

Post-mining land uses (PMLU)										
Rehabilitation area	RA5									
Relevant activities	In-pit and out-of-pit spoil dumps									
Total rehabilitation area size (ha)	1925 ha									
Commencement of first milestone: RM1	10/12/XXXX* + year**									
PMLU	Low intensity cattle grazing (modified pasture)									
Date area is available	Year 5	Year 10	Year 15	Year 20	Year 25	Year 30	Year 32			
Cumulative area available (ha)	33		275	486	736	1131	1925			
Milestone completed by	Year 10	Year 15	Year 20	Year 25	Year 30	Year 32	Year 40	Year 45	Year 52	
Milestone Reference	**Cumulative area achieved (ha)**									
RM1	33		275	486	736	1131	1925			
RM2	33		275	486	736	1131	1925			
RM3	33		275	486	736	1131	1925			
RM5	33		275	486	736		1925			
RM6		33		275	486	736	1925			
RM8			33		275	486	736	1925		
RM10				33		275	486	736	1925	

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3) Insert new rows to the blue table to include additional rehabilitation milestone references.
4) Insert the relevant number in the "Milestone reference" column (i.e. RM1).

Post-mining land uses (PMLU)											
Rehabilitation area	RA6										
Relevant activities	Rail and services corridor										
Total rehabilitation area size (ha)	28 ha										
Commencement of first milestone: RM1	10/12/XXXX* + year**										
PMLU	Low intensity cattle grazing (modified pasture)										
Date area is available	Year 32										
Cumulative area available (ha)	27										
Milestone completed by	Year 35										
Milestone Reference	**Cumulative area achieved (ha)**										
RM1	27										
RM2	27										
RM12	27										

* XXXX is the year of commencement of the Project and is defined as the date of first topsoil stripping

** the year refers to the year at which the land will become available after commencement of the Project and will be added to the commencement year to define the date at which land is available for rehabilitation

1) Insert new columns to the yellow table to include further rehabilitation milestone dates.
2) Insert new columns to the blue table to match rehabilitation milestone dates.
3) Insert new rows to the blue table to include additional rehabilitation milestone references.
4) Insert the relevant number in the "Milestone reference" column (i.e. RM1).

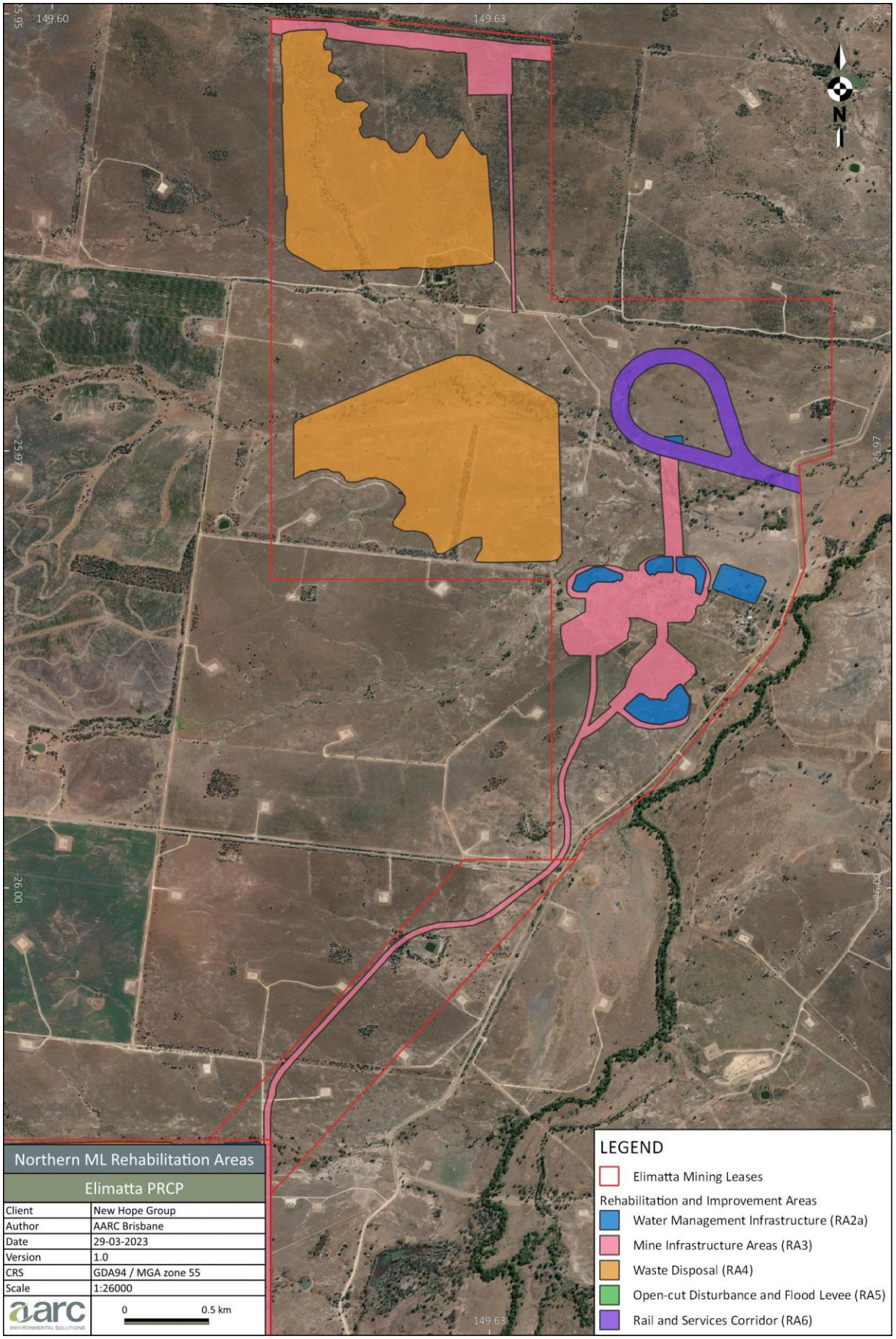
Non-use management area (NUMA)											
Improvement area	IA1										
Relevant activities	Residual voids										
Total size (ha)	218 ha										
Commencement of first milestone: MM1	10/12/XXXX* + year**										
NUMA	Unsuitable										
Date area is available	Year 32										
Cumulative area available (ha)	218										
Milestone completed by	Year 35										
Milestone Reference	**Cumulative area achieved (ha)**										
MM1	218										
MM2	218										
MM3	218										

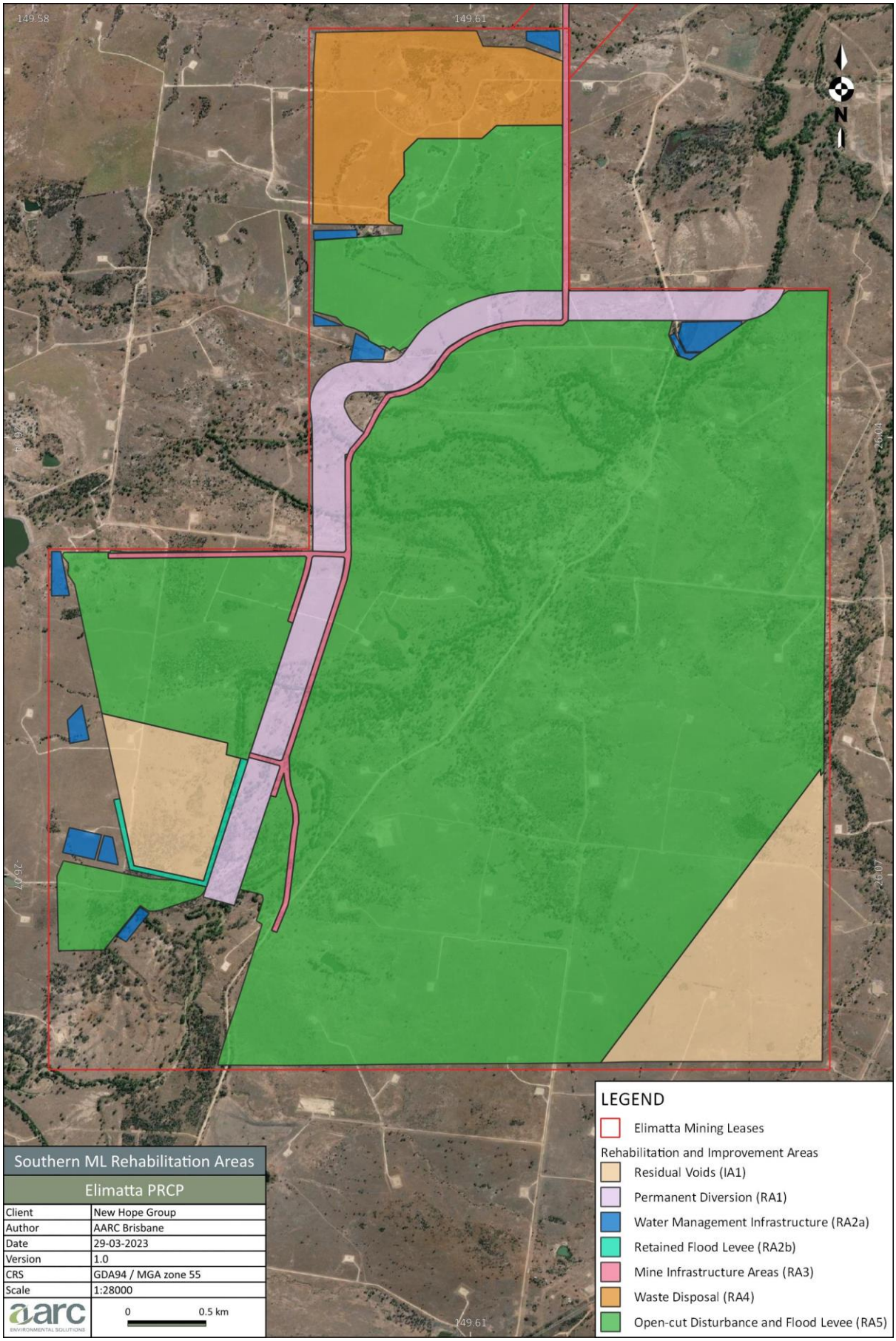
* XXXX is the year of commencement of the Project and is defined as the date of first topsoil stripping

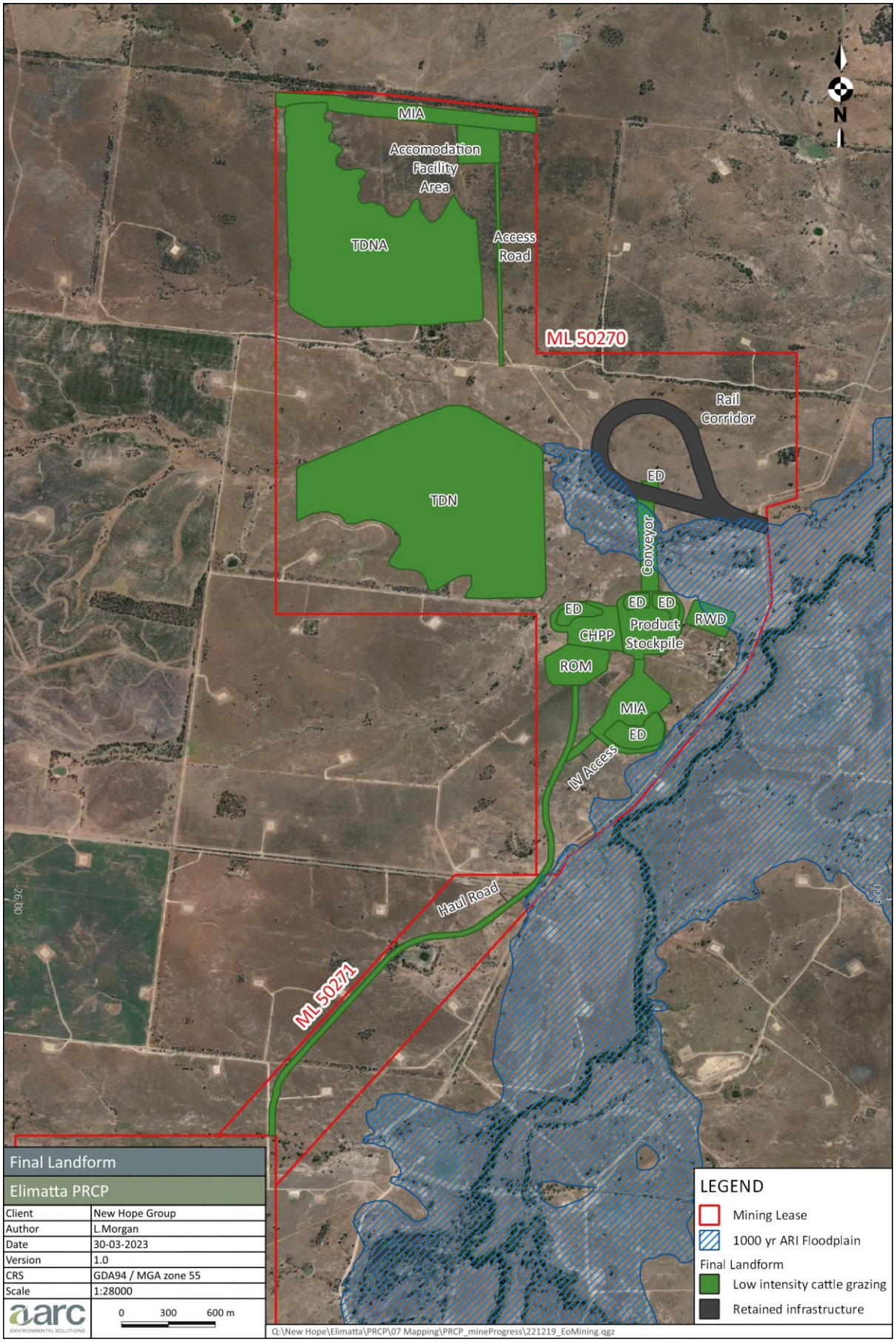
** the year refers to the year at which the land will become available after commencement of the Project and will be added to the commencement year to define the date at which land is available for rehabilitation

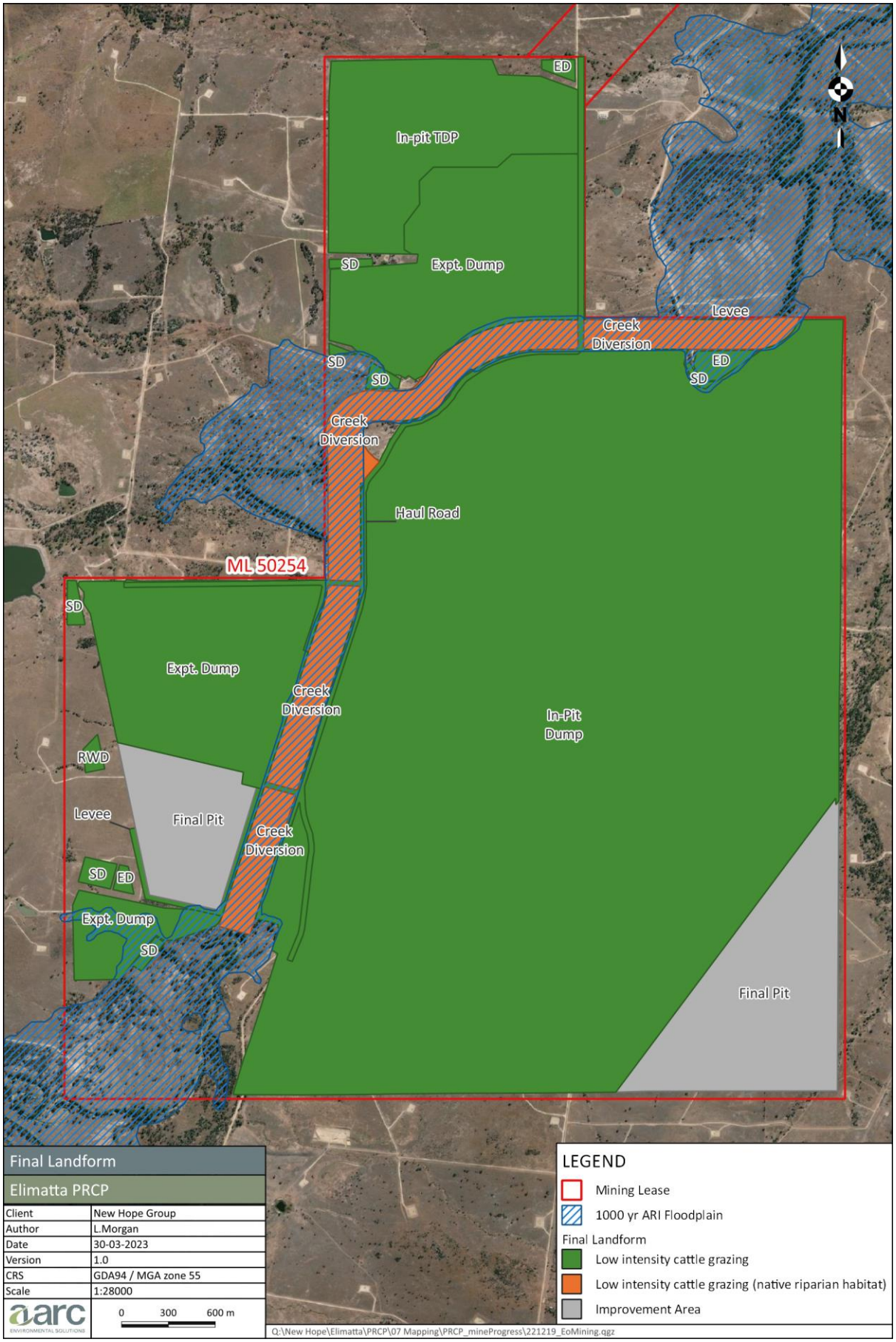
1) Insert new columns to the yellow table to include further management milestone dates.
2) Insert new columns to the blue table to match management milestone dates.
3) Insert new rows to the blue table to include additional management milestone references.
4) Insert the relevant number in the "Milestone reference" column (i.e. MM1).

Appendix B. PRCP Reference Map and Final Site Design

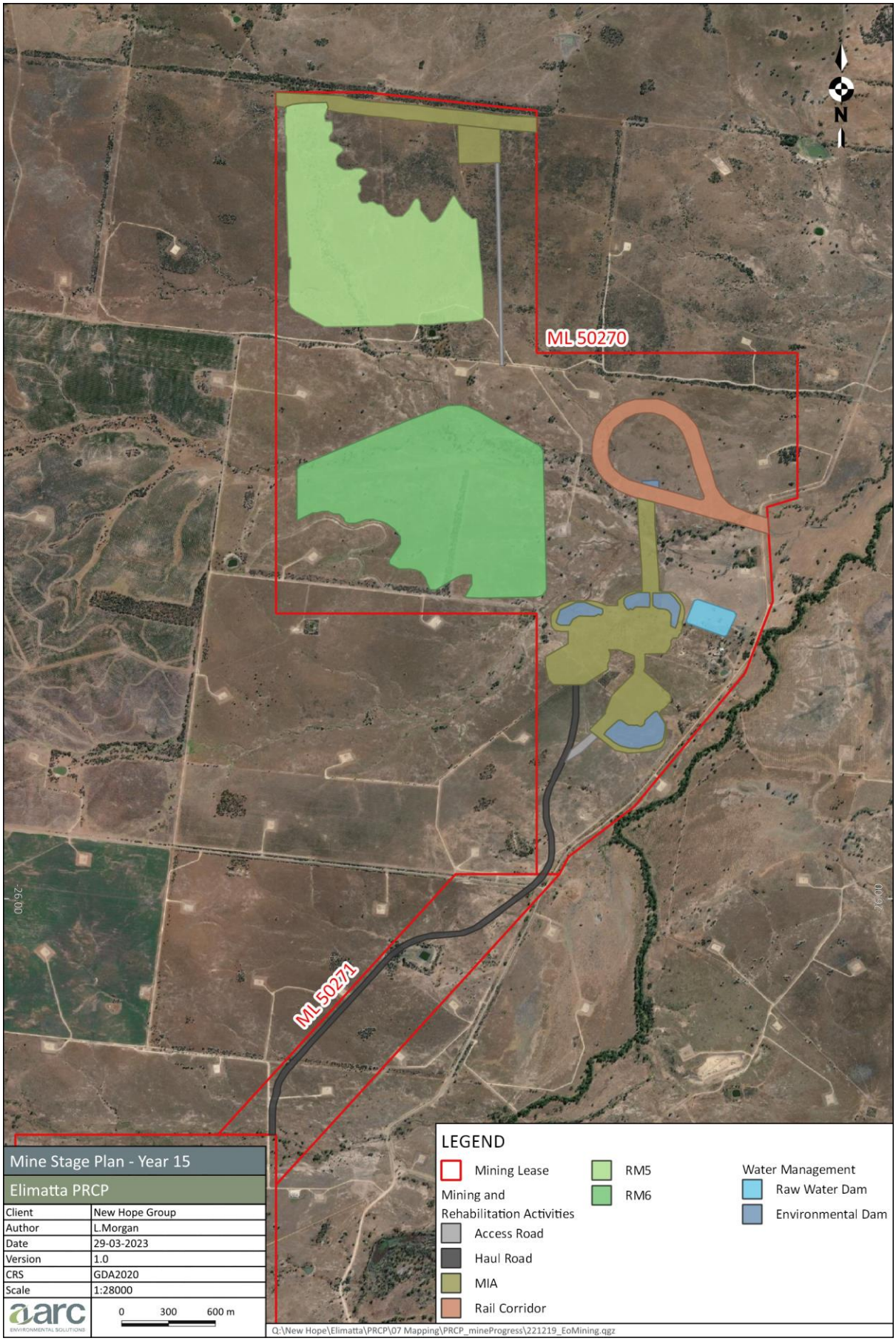

149.60
149.63
-25.95
-25.97
-26.00
N
LEGEND
Elimatta Mining Leases
Rehabilitation and Improvement Areas
Water Management Infrastructure (RA2a)
Mine Infrastructure Areas (RA3)
Waste Disposal (RA4)
Open-cut Disturbance and Flood Levee (RA5)
Rail and Services Corridor (RA6)
Northern ML Rehabilitation Areas
Elimatta PRCP
Client | New Hope Group
Author | AARC Brisbane
Date | 29-03-2023
Version | 1.0
CRS | GDA94 / MGA zone 55
Scale | 1:26000
0
0.5 km


149.58
149.61
26.04
26.07
N
LEGEND
Elimatta Mining Leases
Rehabilitation and Improvement Areas
Residual Voids (IA1)
Permanent Diversion (RA1)
Water Management Infrastructure (RA2a)
Retained Flood Levee (RA2b)
Mine Infrastructure Areas (RA3)
Waste Disposal (RA4)
Open-cut Disturbance and Flood Levee (RA5)
Southern ML Rehabilitation Areas
Elimatta PRCP
Client
New Hope Group
Author
AARC Brisbane
Date
29-03-2023
Version
1.0
CRS
GDA94 / MGA zone 55
Scale
1:28000
0
0.5 km


MIA
Accomodation Facility Area
TDNA
Access Road
ML 50270
Rail Corridor
ED
TDN
Conveyor
ED
ED
ED
Product Stockpile
RWD
CHPP
ROM
MIA
ED
LV Access
Haul Road
ML 50271
-2600
-2600
N
Final Landform
Elimatta PRCP
Client | New Hope Group
Author | L.Morgan
Date | 30-03-2023
Version | 1.0
CRS | GDA94 / MGA zone 55
Scale | 1:28000
0 300 600 m
LEGEND
Mining Lease
1000 yr ARI Floodplain
Final Landform
Low intensity cattle grazing
Retained infrastructure
Q:\New Hope\Elimatta\PRCP\07 Mapping\PRCP_mineProgress\221219_EoMining.qgz


ED
In-pit TDP
SD
Expt. Dump
Levee
Creek Diversion
SD
ED
SD
SD
Creek Diversion
Haul Road
ML 50254
SD
Expt. Dump
Creek Diversion
In-Pit Dump
RWD
Levee
Final Pit
Creek Diversion
SD
ED
Expt. Dump
SD
Final Pit
N
Final Landform
Elimatta PRCP
Client | New Hope Group
Author | L.Morgan
Date | 30-03-2023
Version | 1.0
CRS | GDA94 / MGA zone 55
Scale | 1:28000
0 300 600 m
LEGEND
Mining Lease
1000 yr ARI Floodplain
Final Landform
Low intensity cattle grazing
Low intensity cattle grazing (native riparian habitat)
Improvement Area
Q:\New Hope\Elimatta\PRCP\07 Mapping\PRCP_mineProgress\221219_EoMining.qgz

Appendix C. Schedule stage plans



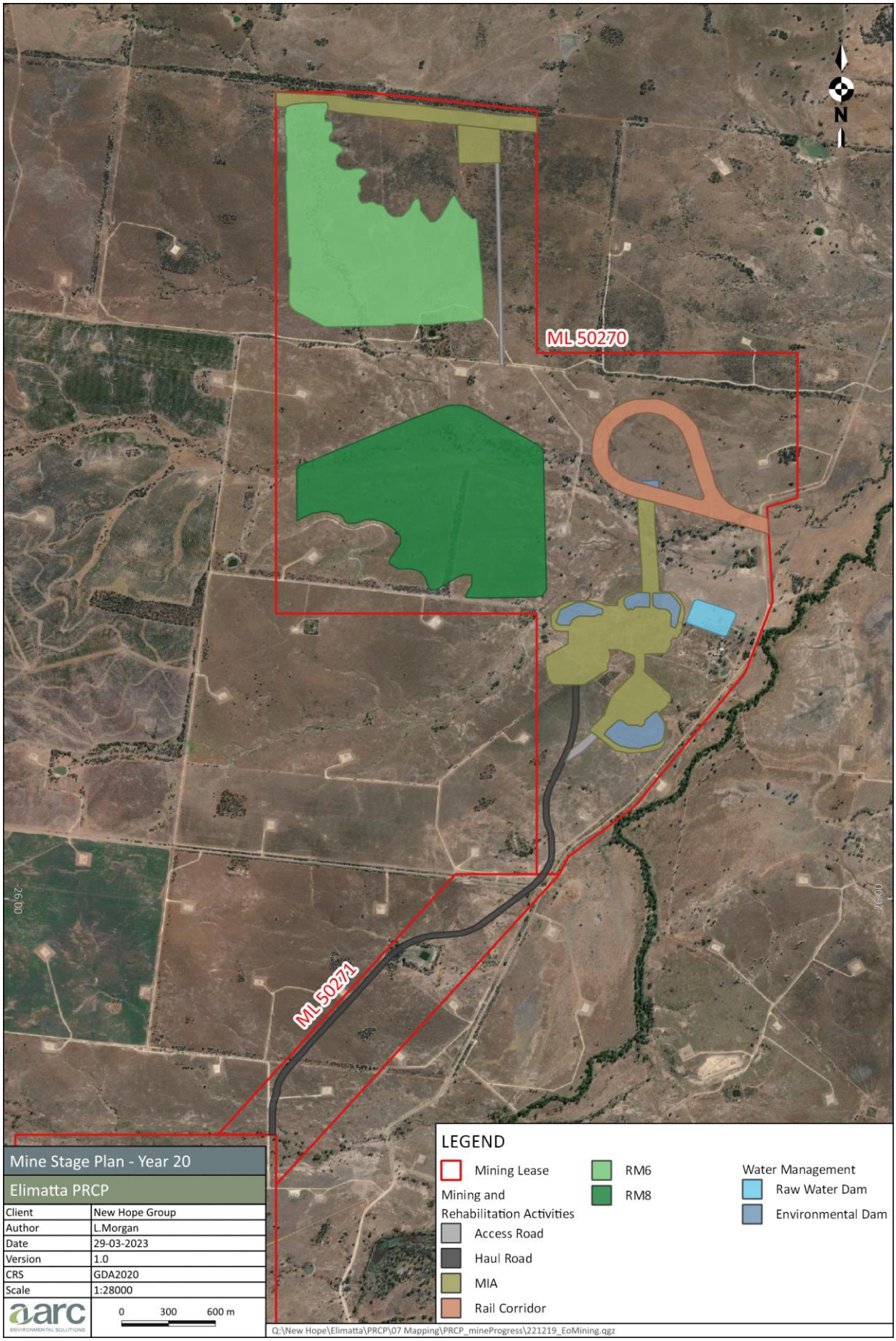
Mine Stage Plan - Year 15

Elimatta PRCP

Client	New Hope Group
Author	L.Morgan
Date	29-03-2023
Version	1.0
CRS	GDA2020
Scale	1:28000

arc ENVIRONMENTAL SOLUTIONS

0 300 600 m



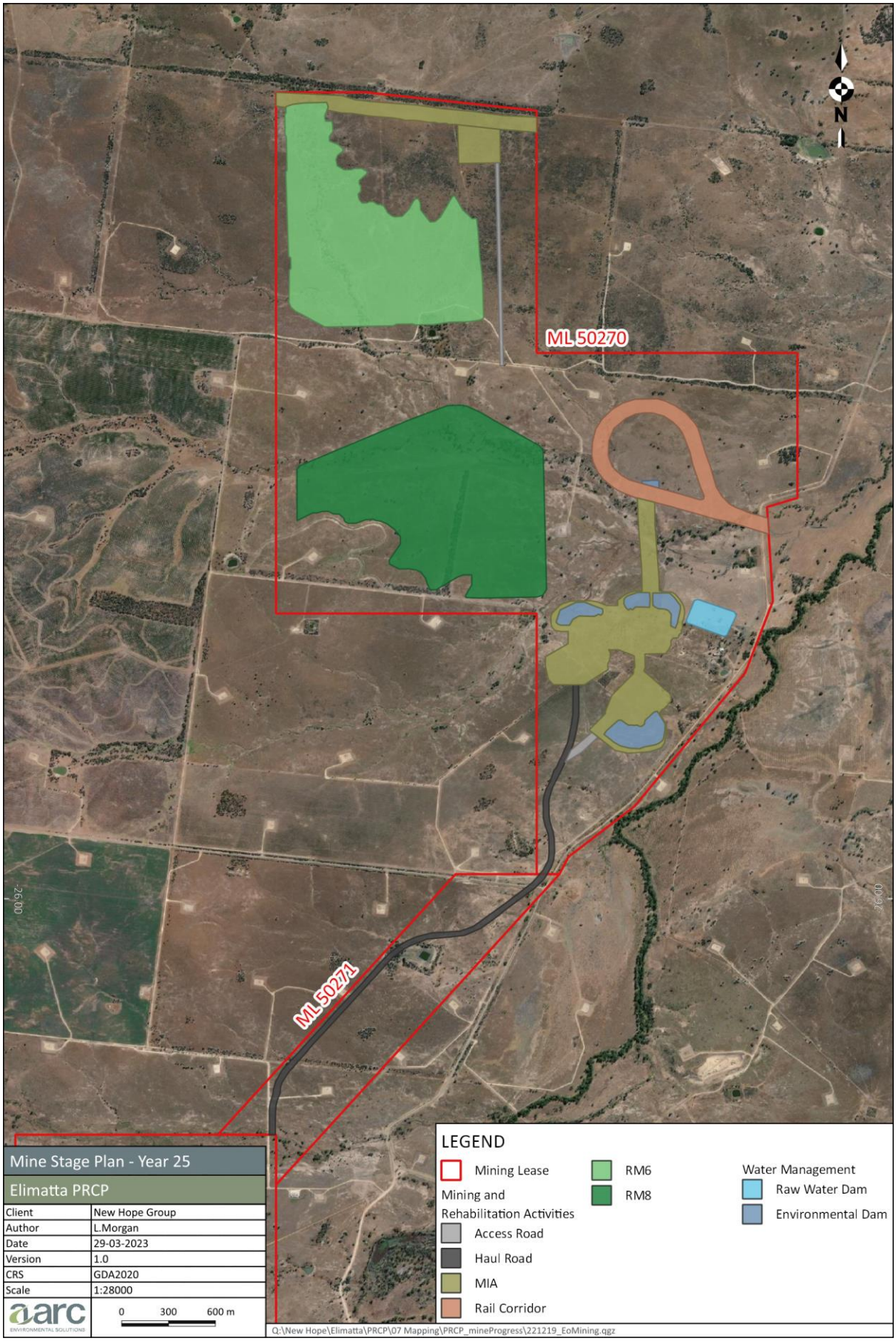
Mine Stage Plan - Year 20

Elimatta PRCP

Client	New Hope Group
Author	L.Morgan
Date	29-03-2023
Version	1.0
CRS	GDA2020
Scale	1:28000

arc ENVIRONMENTAL SOLUTIONS

0 300 600 m



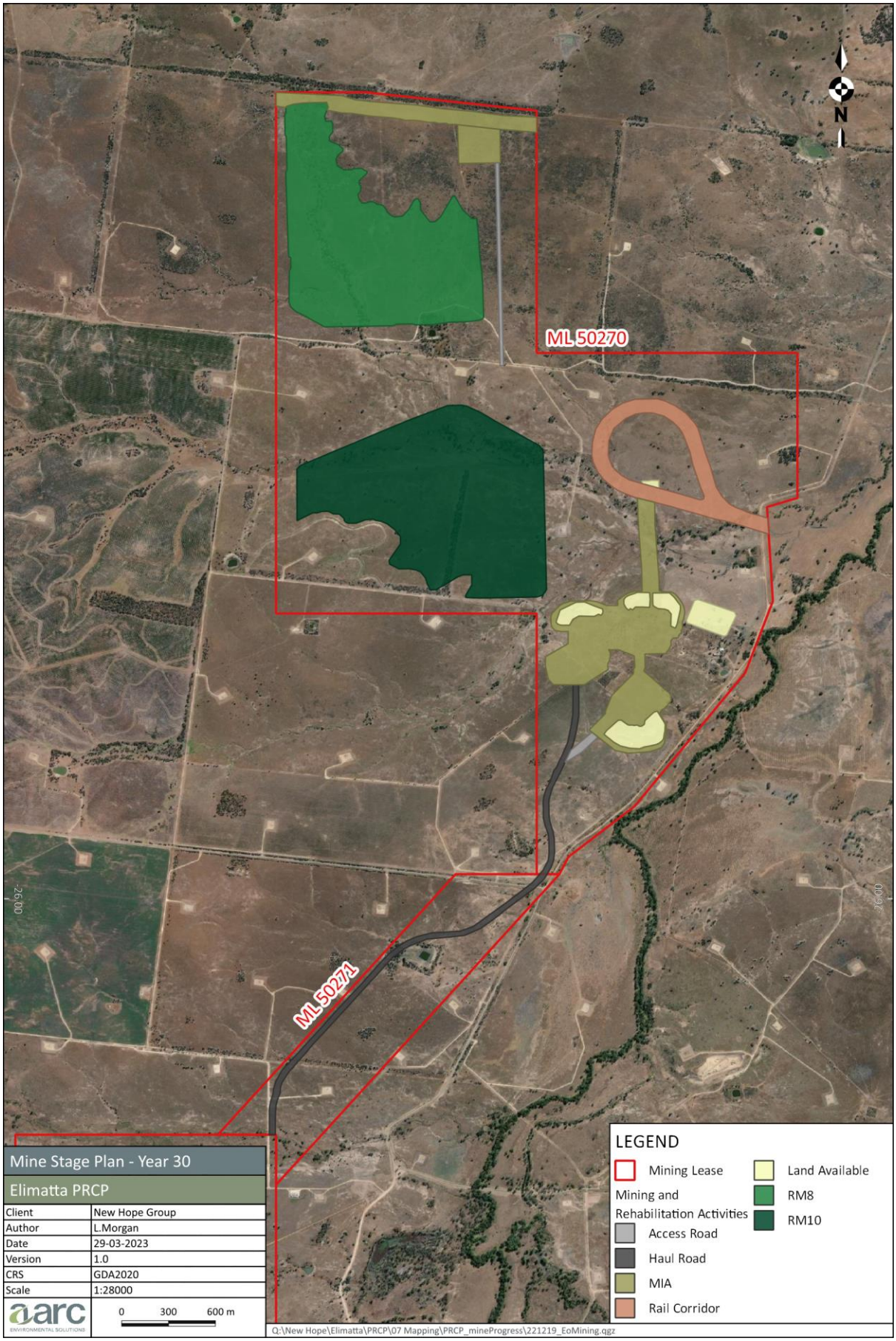
Mine Stage Plan - Year 25

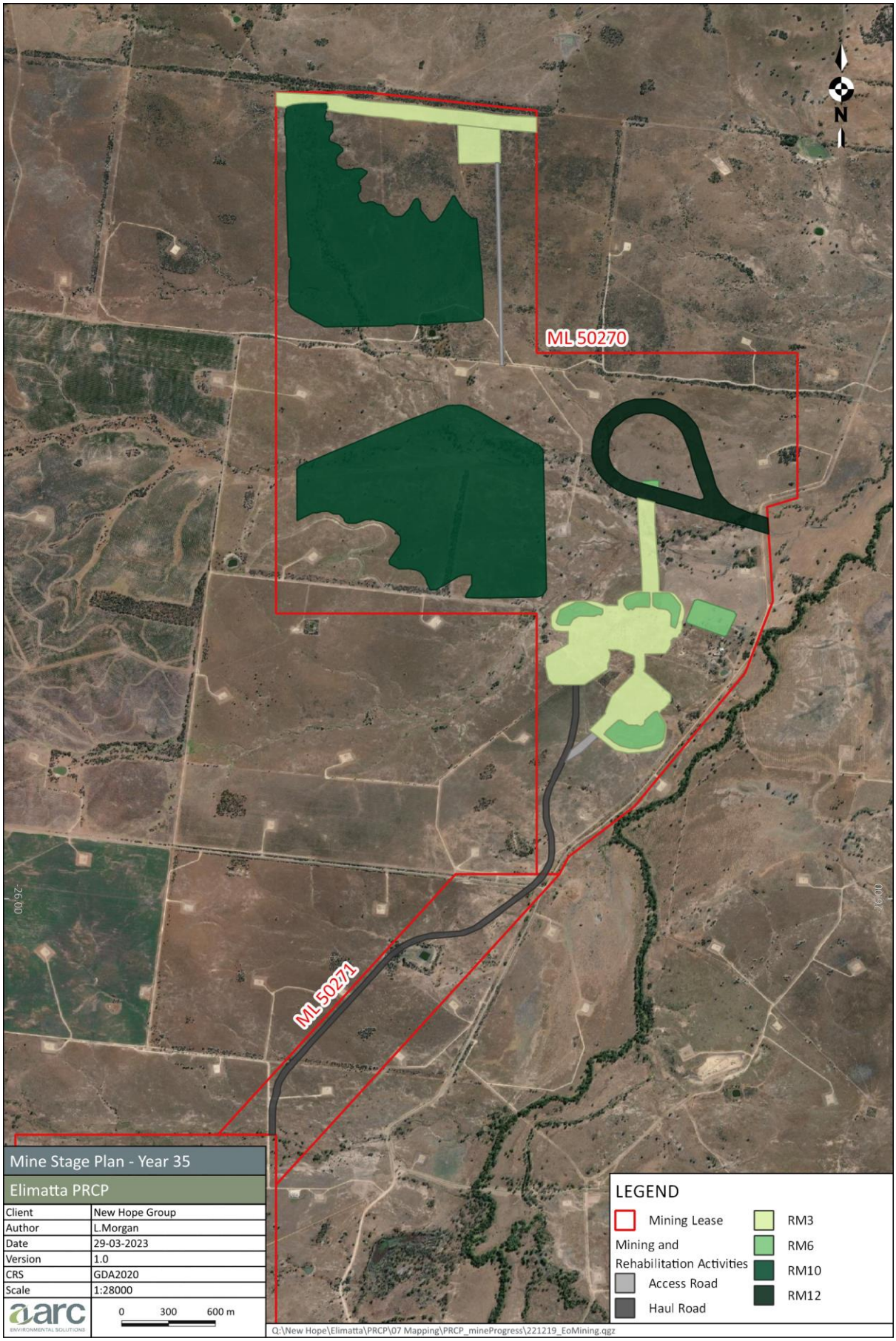
Elimatta PRCP

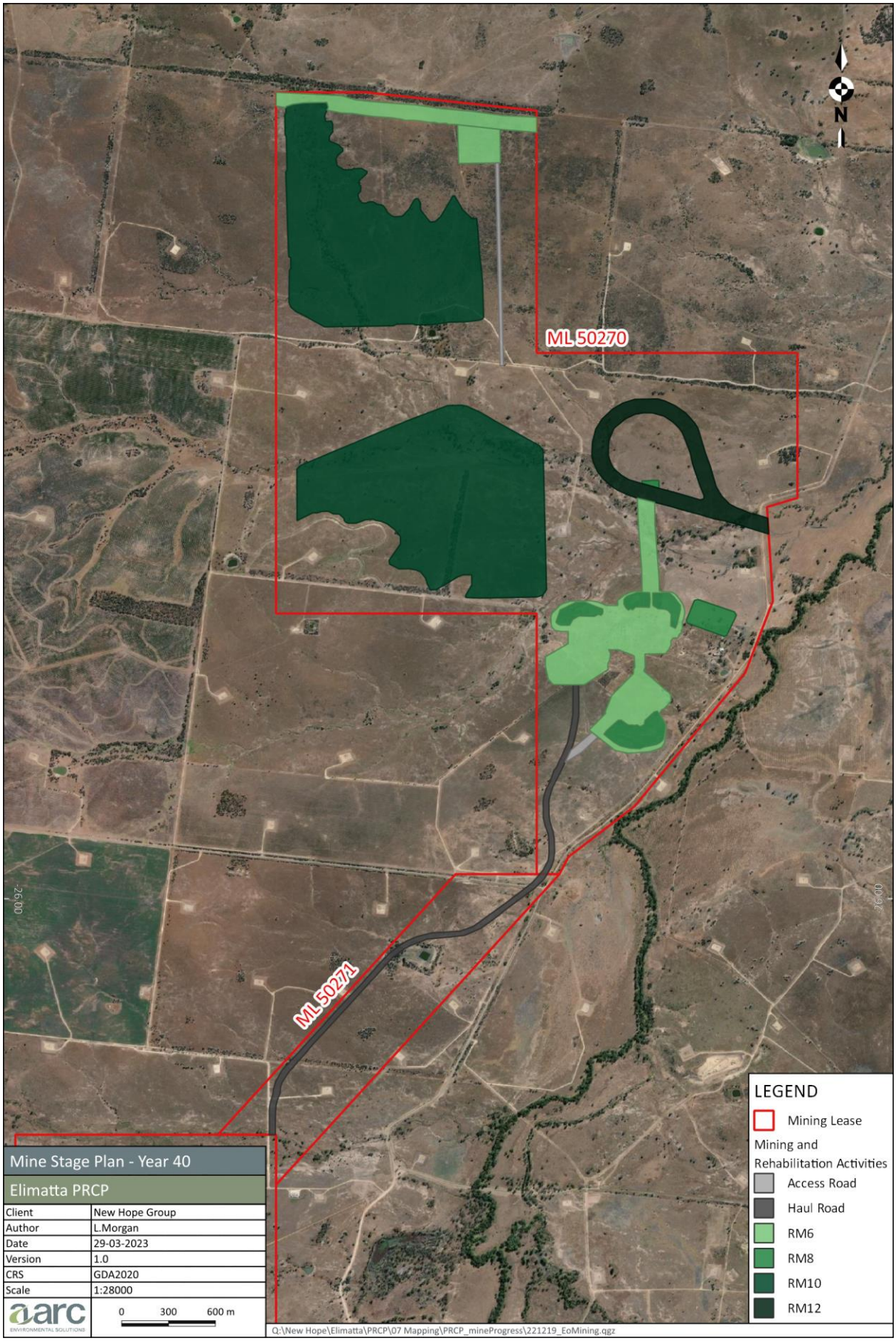
Client	New Hope Group
Author	L.Morgan
Date	29-03-2023
Version	1.0
CRS	GDA2020
Scale	1:28000

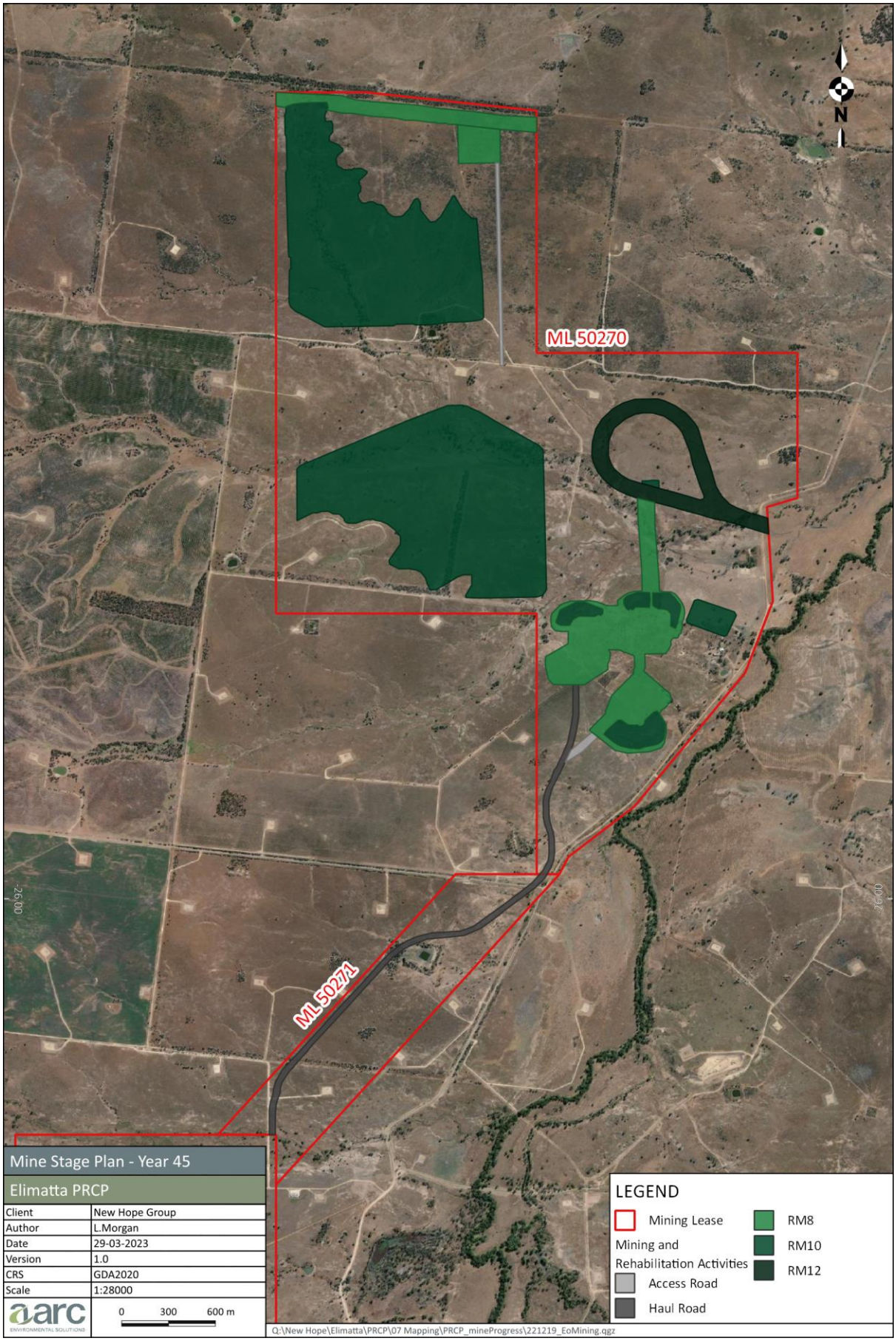
arc ENVIRONMENTAL SOLUTIONS

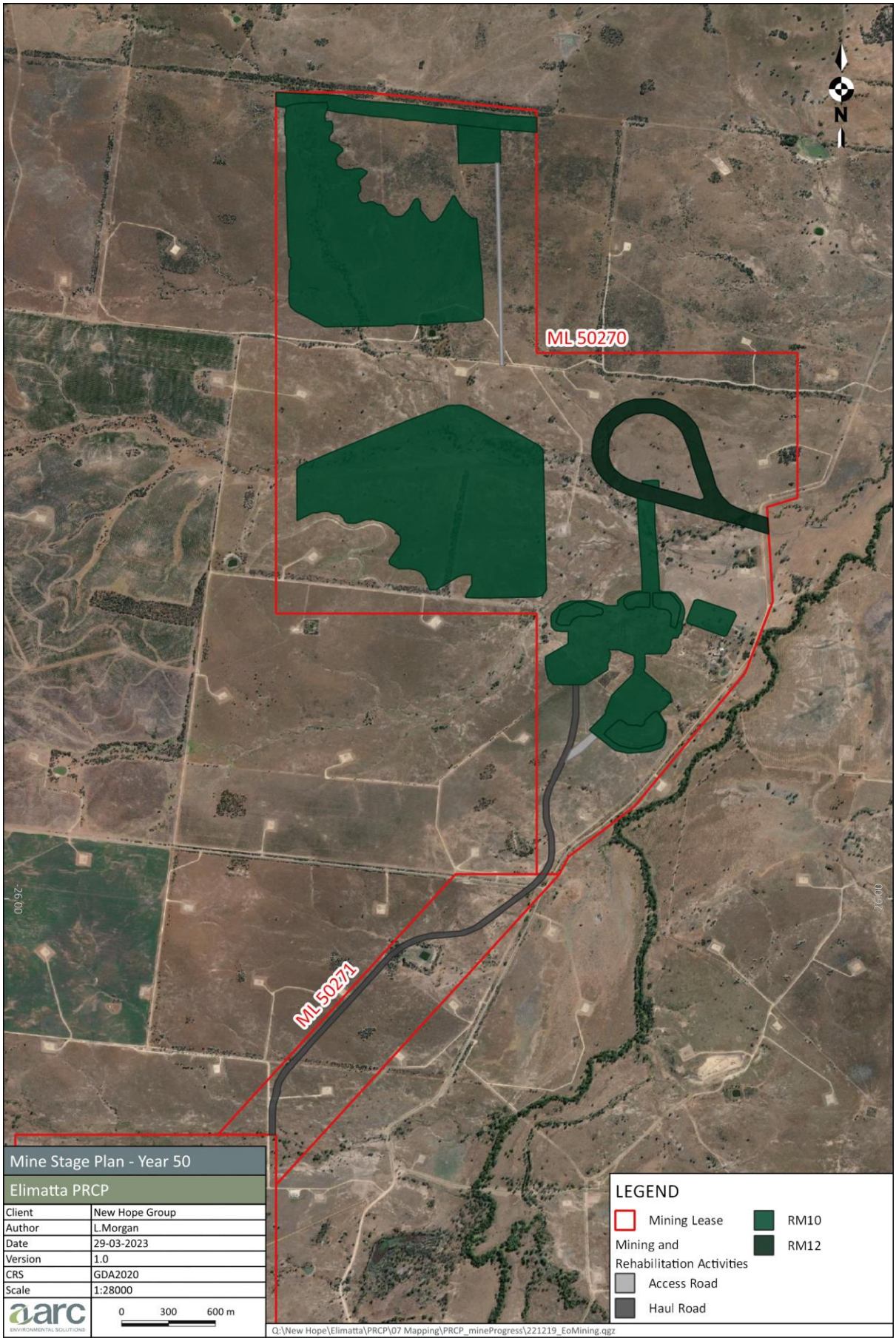
0 300 600 m

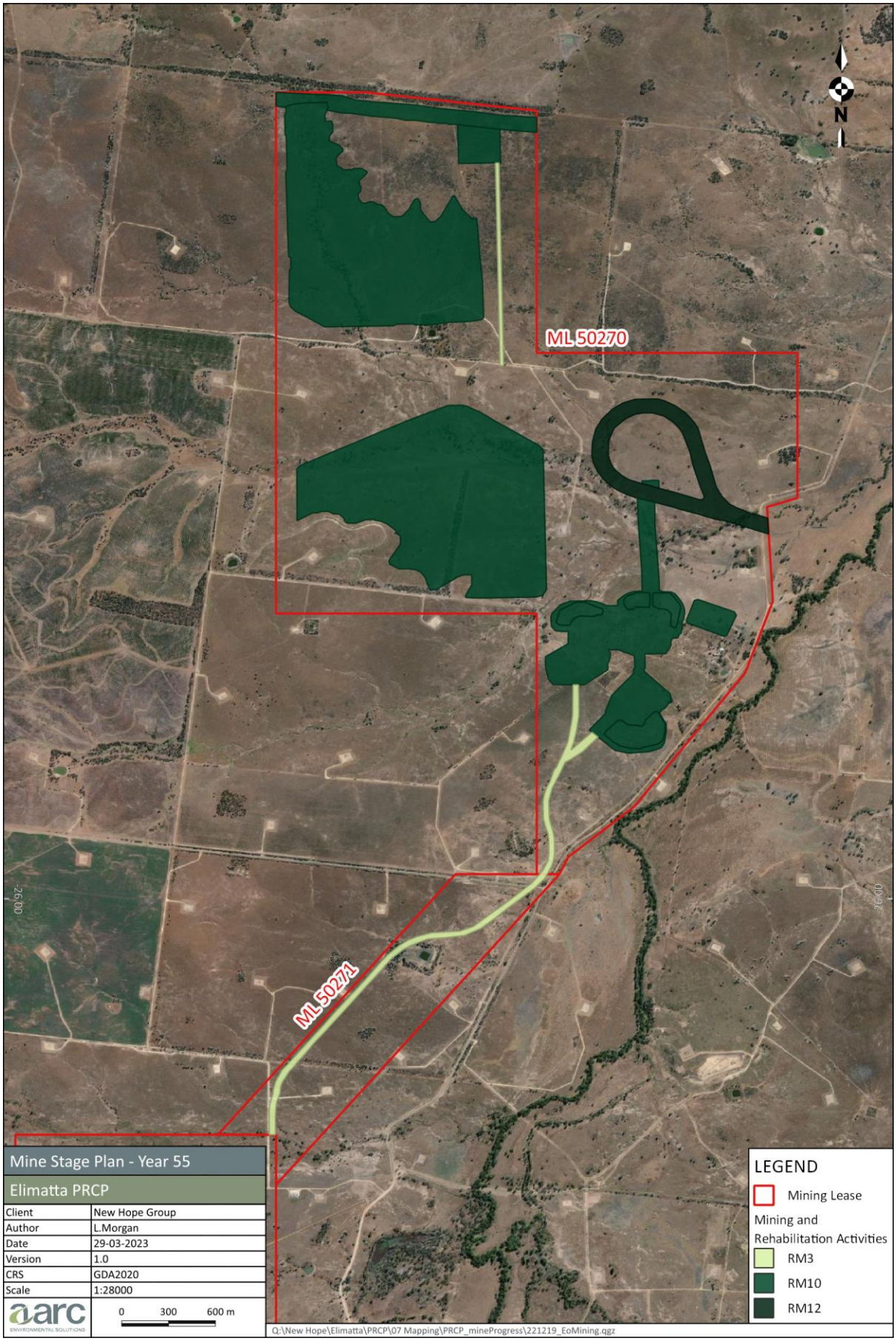

N
ML 50270
ML 50271
-26.00
-26.00
LEGEND
Mining Lease
Land Available
Mining and Rehabilitation Activities
RM8
RM10
Access Road
Haul Road
MIA
Rail Corridor
Mine Stage Plan - Year 30
Elimatta PRCP
Client | New Hope Group
Author | L.Morgan
Date | 29-03-2023
Version | 1.0
CRS | GDA2020
Scale | 1:28000
0 300 600 m
Q:\New Hope\Elimatta\PRCP\07 Mapping\PRCP_mineProgress\221219_EoMining.qgz

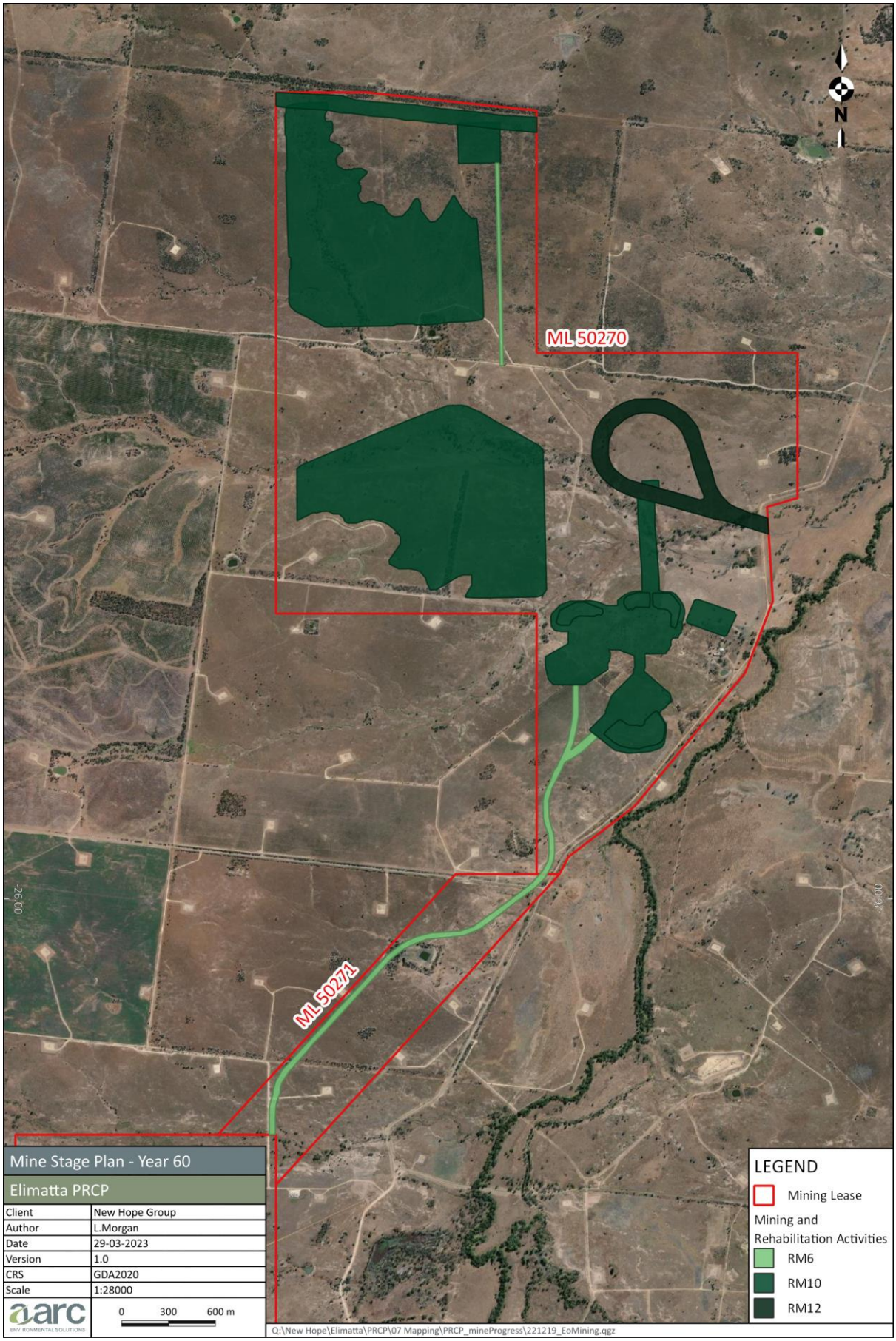

N
ML 50270
ML 50271
-26.00
-26.00
Mine Stage Plan - Year 35
Elimatta PRCP
Client | New Hope Group
Author | L.Morgan
Date | 29-03-2023
Version | 1.0
CRS | GDA2020
Scale | 1:28000
arc ENVIRONMENTAL SOLUTIONS
0 300 600 m
LEGEND
Mining Lease
Mining and Rehabilitation Activities
Access Road
Haul Road
RM3
RM6
RM10
RM12
Q:\New Hope\Elimatta\PRCP\07 Mapping\PRCP_mineProgress\221219_EoMining.qgz

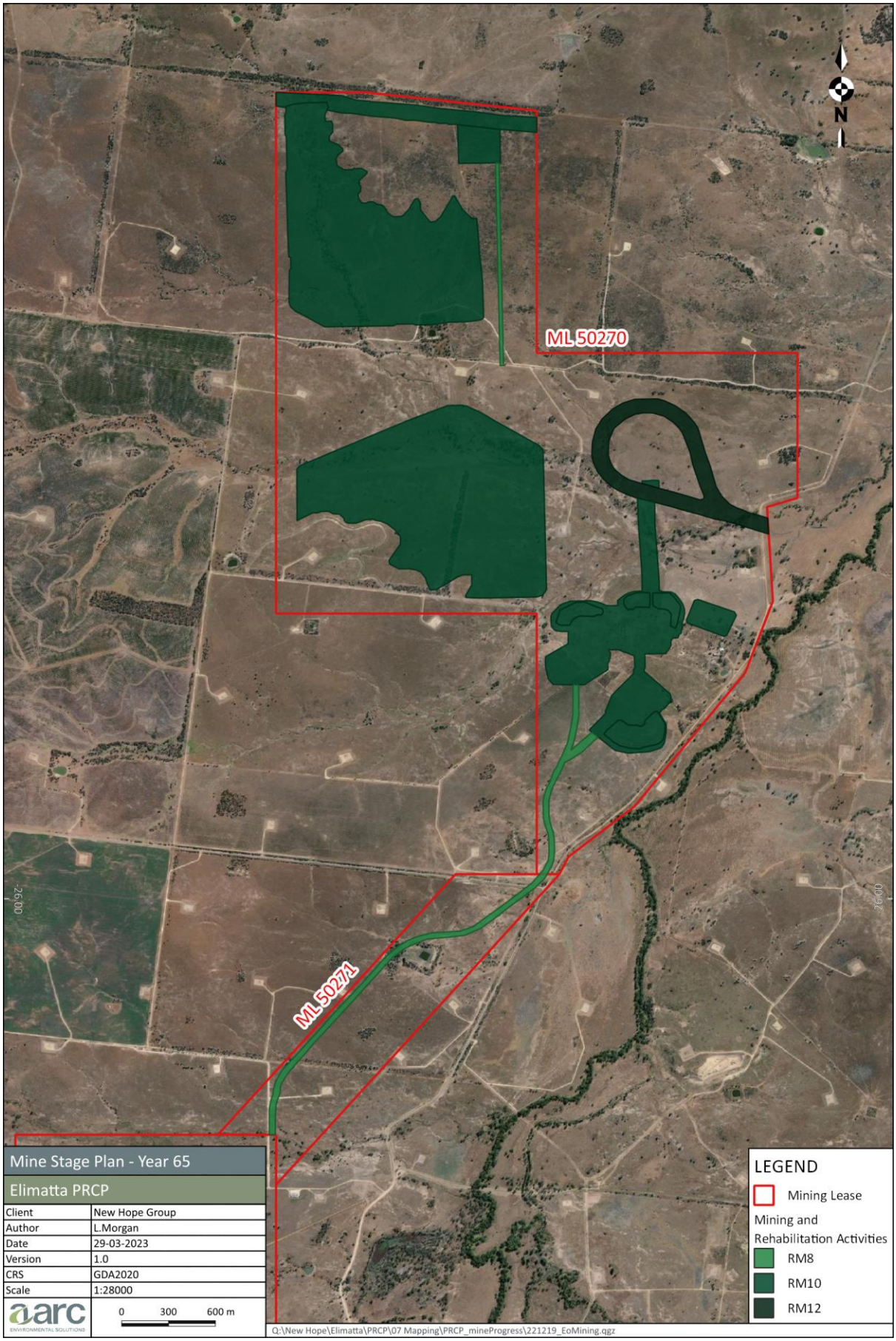

N
ML 50270
ML 50271
-26.00
-26.00
LEGEND
Mining Lease
Mining and Rehabilitation Activities
Access Road
Haul Road
RM6
RM8
RM10
RM12
Mine Stage Plan - Year 40
Elimatta PRCP
Client | New Hope Group
Author | L.Morgan
Date | 29-03-2023
Version | 1.0
CRS | GDA2020
Scale | 1:28000
0 300 600 m
Q:\New Hope\Elimatta\PRCP\07 Mapping\PRCP_mineProgress\221219_EoMining.qgz

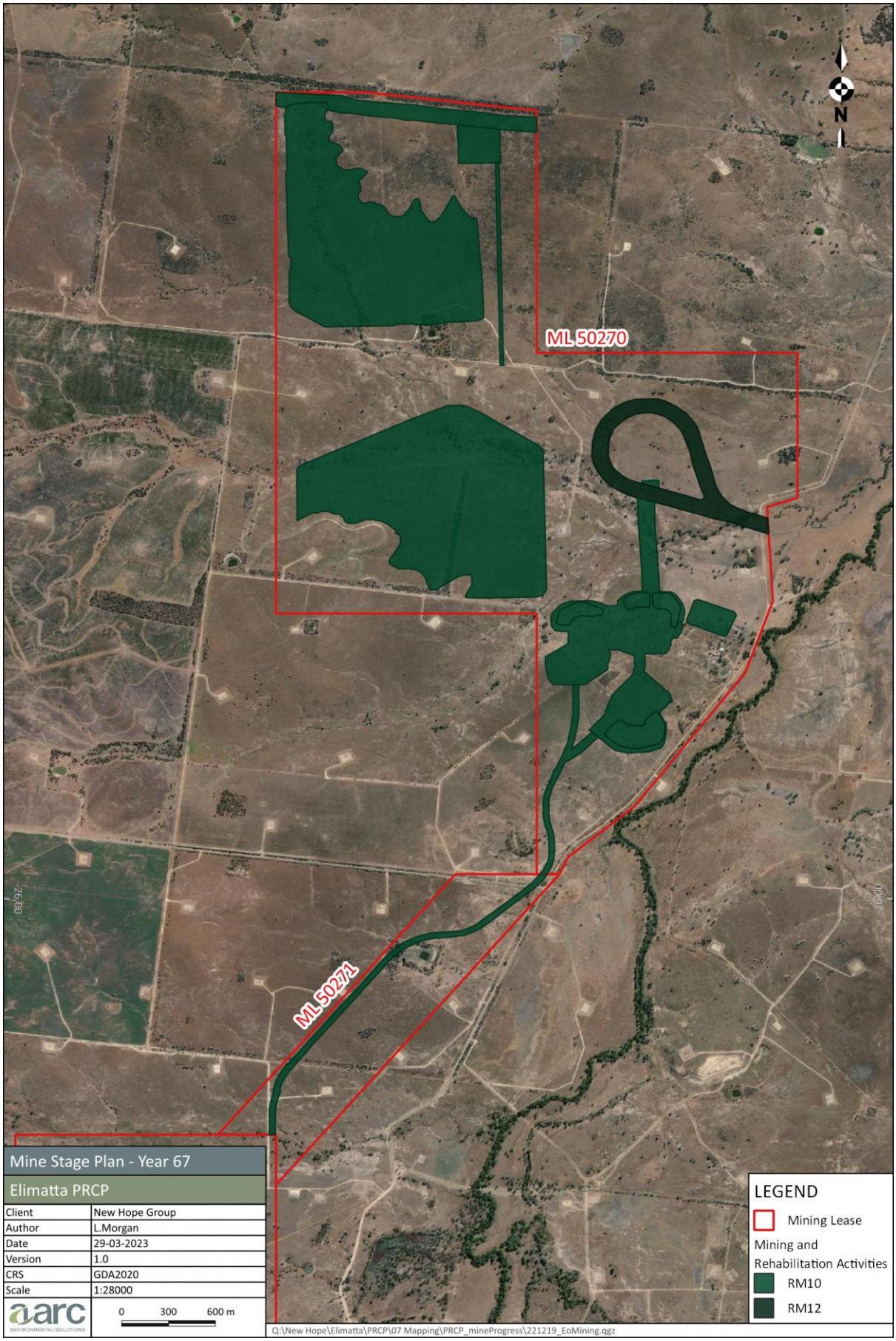

N
ML 50270
ML 50271
-26.00
-26.00
Mine Stage Plan - Year 45
Elimatta PRCP
Client New Hope Group
Author L.Morgan
Date 29-03-2023
Version 1.0
CRS GDA2020
Scale 1:28000
arc ENVIRONMENTAL SOLUTIONS
0 300 600 m
LEGEND
Mining Lease
Mining and Rehabilitation Activities
Access Road
Haul Road
RM8
RM10
RM12
Q:\New Hope\Elimatta\PRCP\07 Mapping\PRCP_mineProgress\221219_EoMining.qgz

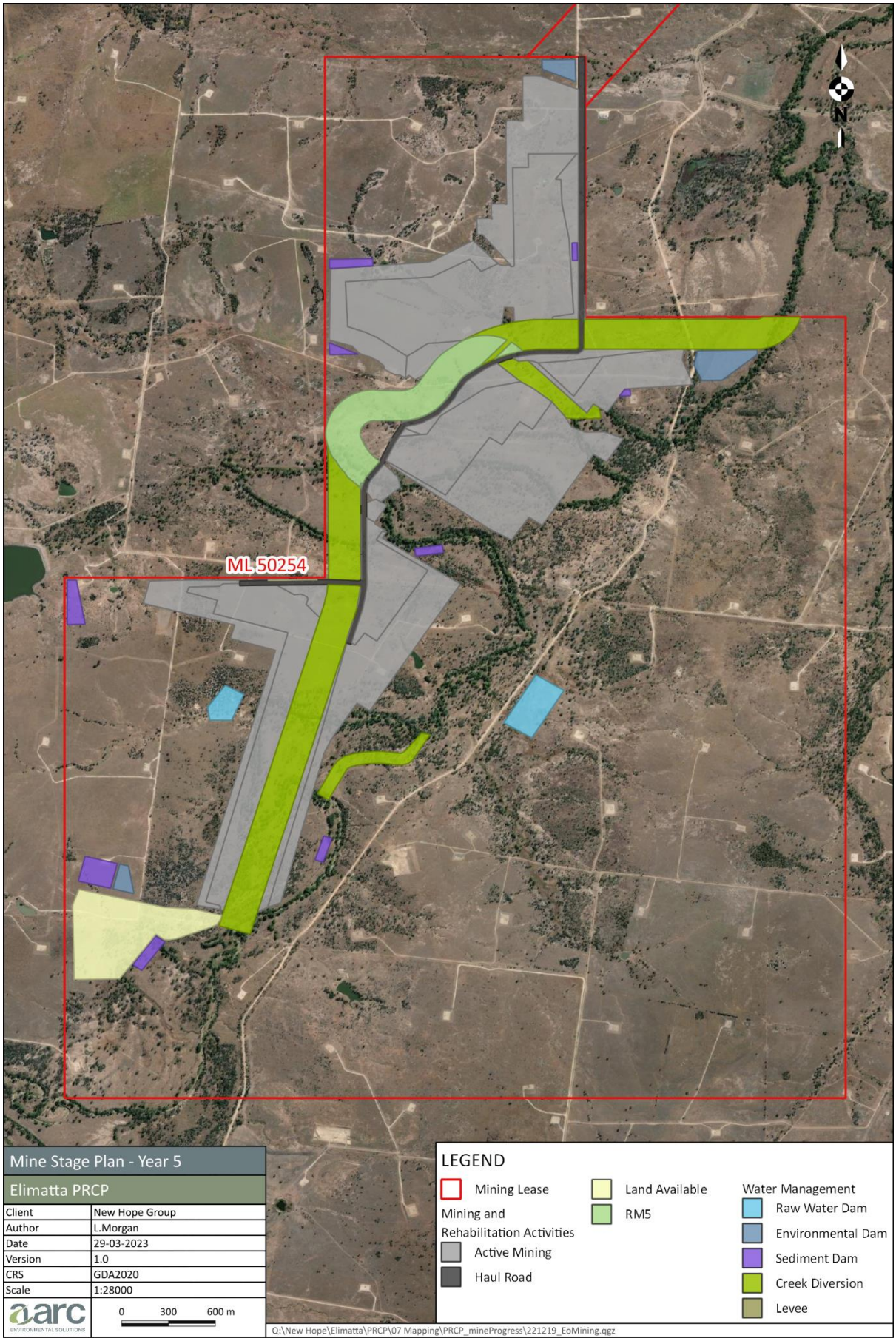

N
ML 50270
ML 50271
-26.00
Mine Stage Plan - Year 50
Elimatta PRCP
Client New Hope Group
Author L.Morgan
Date 29-03-2023
Version 1.0
CRS GDA2020
Scale 1:28000
0 300 600 m
LEGEND
Mining Lease
Mining and Rehabilitation Activities
Access Road
Haul Road
RM10
RM12
Q:\New Hope\Elimatta\PRCP\07 Mapping\PRCP_mineProgress\221219_EoMining.qgz

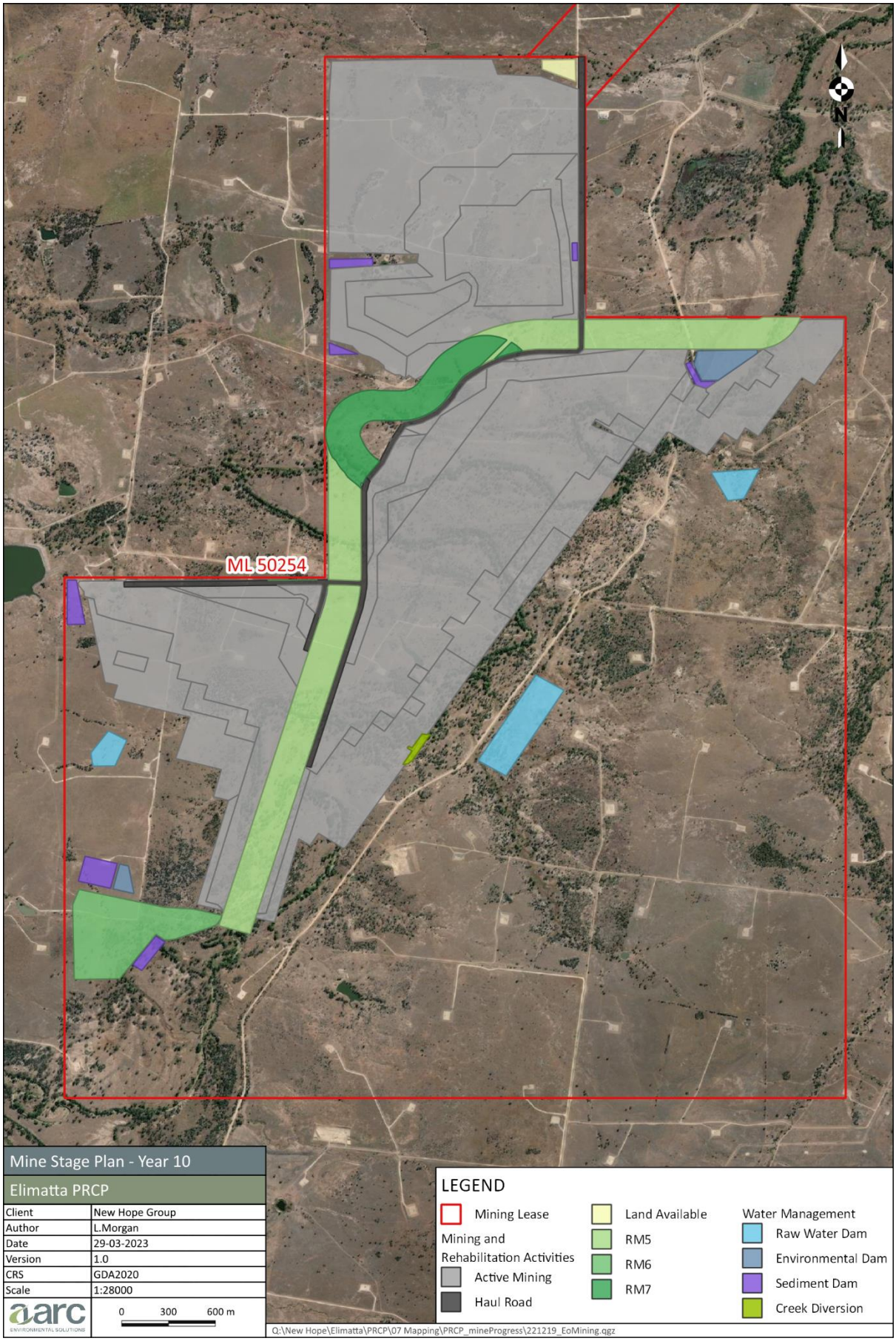

N
ML 50270
ML 50271
-26.00
-26.00
Mine Stage Plan - Year 55
Elimatta PRCP
Client | New Hope Group
Author | L.Morgan
Date | 29-03-2023
Version | 1.0
CRS | GDA2020
Scale | 1:28000
arc ENVIRONMENTAL SOLUTIONS
0 300 600 m
LEGEND
Mining Lease
Mining and Rehabilitation Activities
RM3
RM10
RM12
Q:\New Hope\Elimatta\PRCP\07 Mapping\PRCP_mineProgress\221219_EoMining.qgz

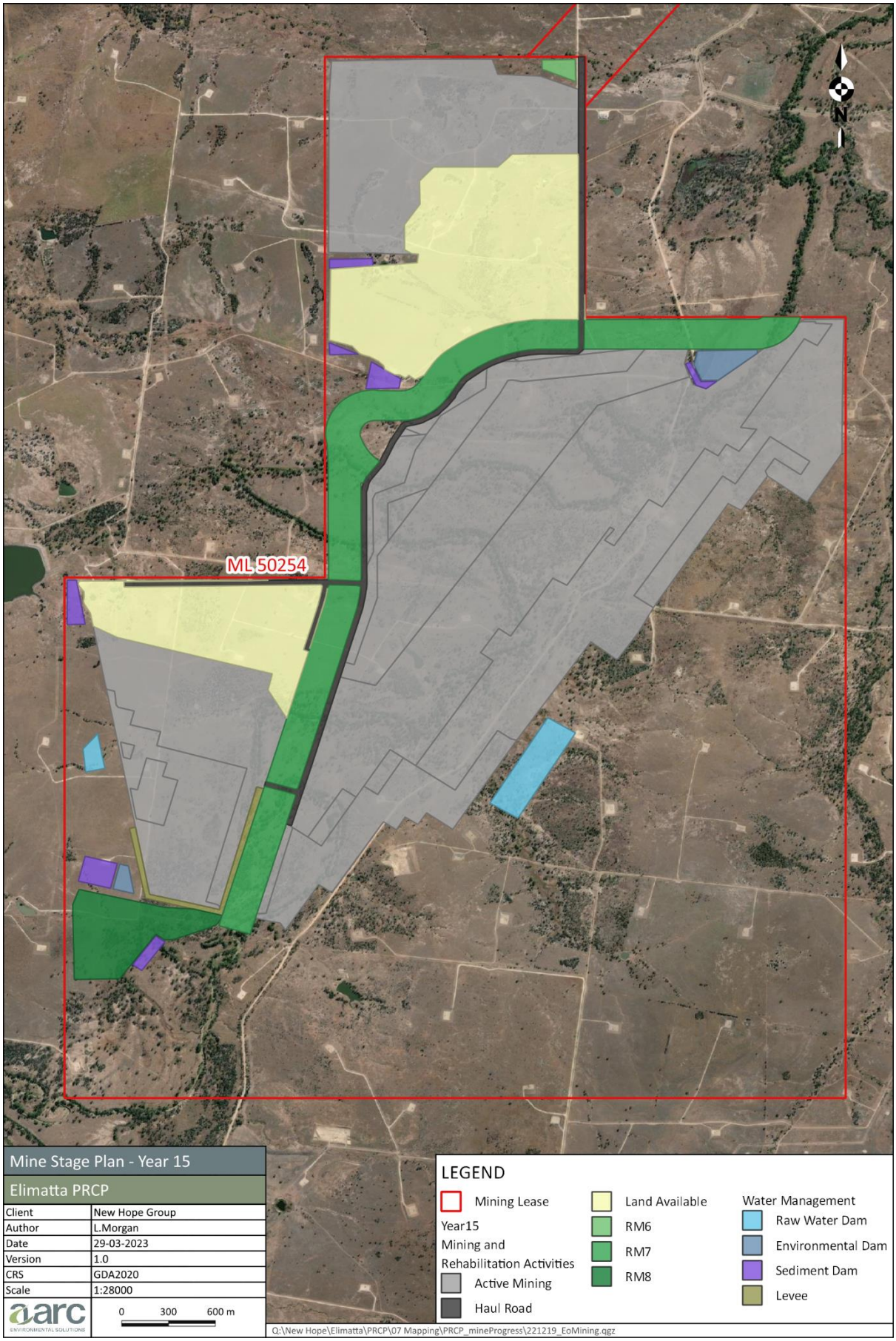

N
ML 50270
ML 50271
-26.00
-26.00
Mine Stage Plan - Year 60
Elimatta PRCP
Client | New Hope Group
Author | L.Morgan
Date | 29-03-2023
Version | 1.0
CRS | GDA2020
Scale | 1:28000
arc ENVIRONMENTAL SOLUTIONS
0 300 600 m
LEGEND
Mining Lease
Mining and Rehabilitation Activities
RM6
RM10
RM12
Q:\New Hope\Elimatta\PRCP\07 Mapping\PRCP_mineProgress\221219_EoMining.qgz

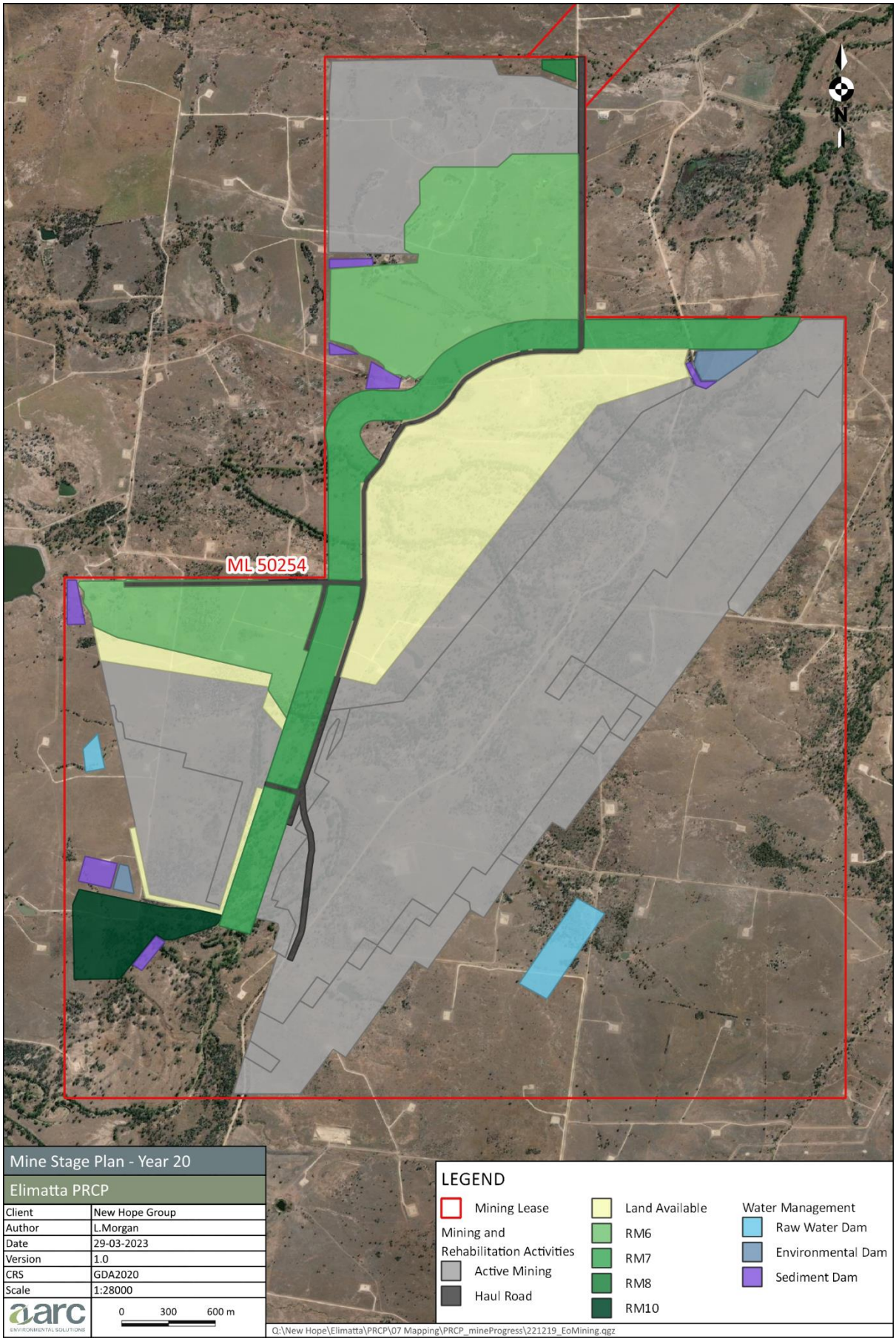

N
ML 50270
ML 50271
-26.00
-26.00
Mine Stage Plan - Year 65
Elimatta PRCP
Client | New Hope Group
Author | L.Morgan
Date | 29-03-2023
Version | 1.0
CRS | GDA2020
Scale | 1:28000
arc ENVIRONMENTAL SOLUTIONS
0 300 600 m
LEGEND
Mining Lease
Mining and Rehabilitation Activities
RM8
RM10
RM12
Q:\New Hope\Elimatta\PRCP\07 Mapping\PRCP_mineProgress\221219_EoMining.qgz

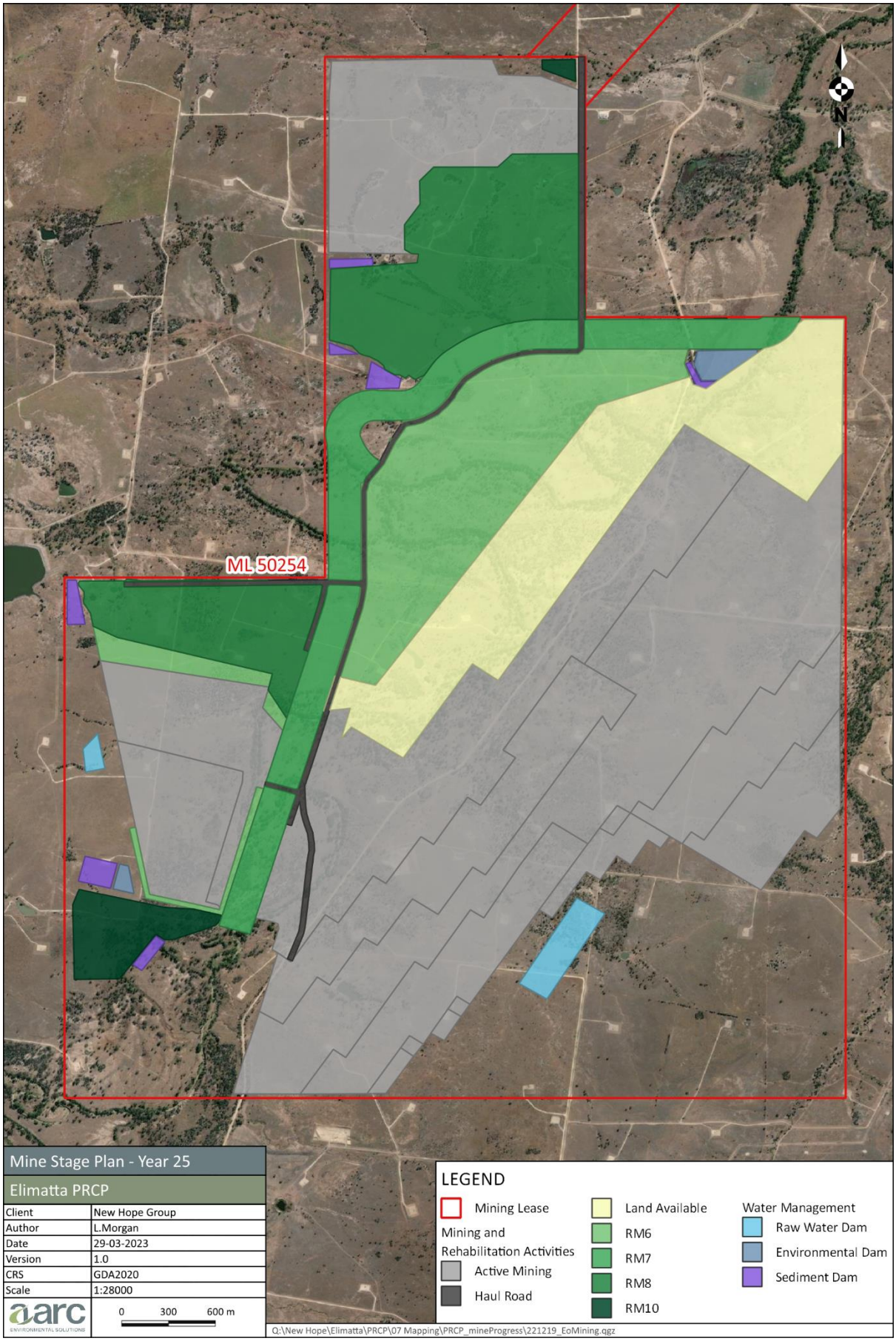

N
ML 50270
ML 50271
-26.00
Mine Stage Plan - Year 67
Elimatta PRCP
Client | New Hope Group
Author | L.Morgan
Date | 29-03-2023
Version | 1.0
CRS | GDA2020
Scale | 1:28000
arc ENVIRONMENTAL SOLUTIONS
0 300 600 m
LEGEND
Mining Lease
Mining and Rehabilitation Activities
RM10
RM12
Q:\New Hope\Elimatta\PRCP\07 Mapping\PRCP_mineProgress\221219_EoMining.qgz

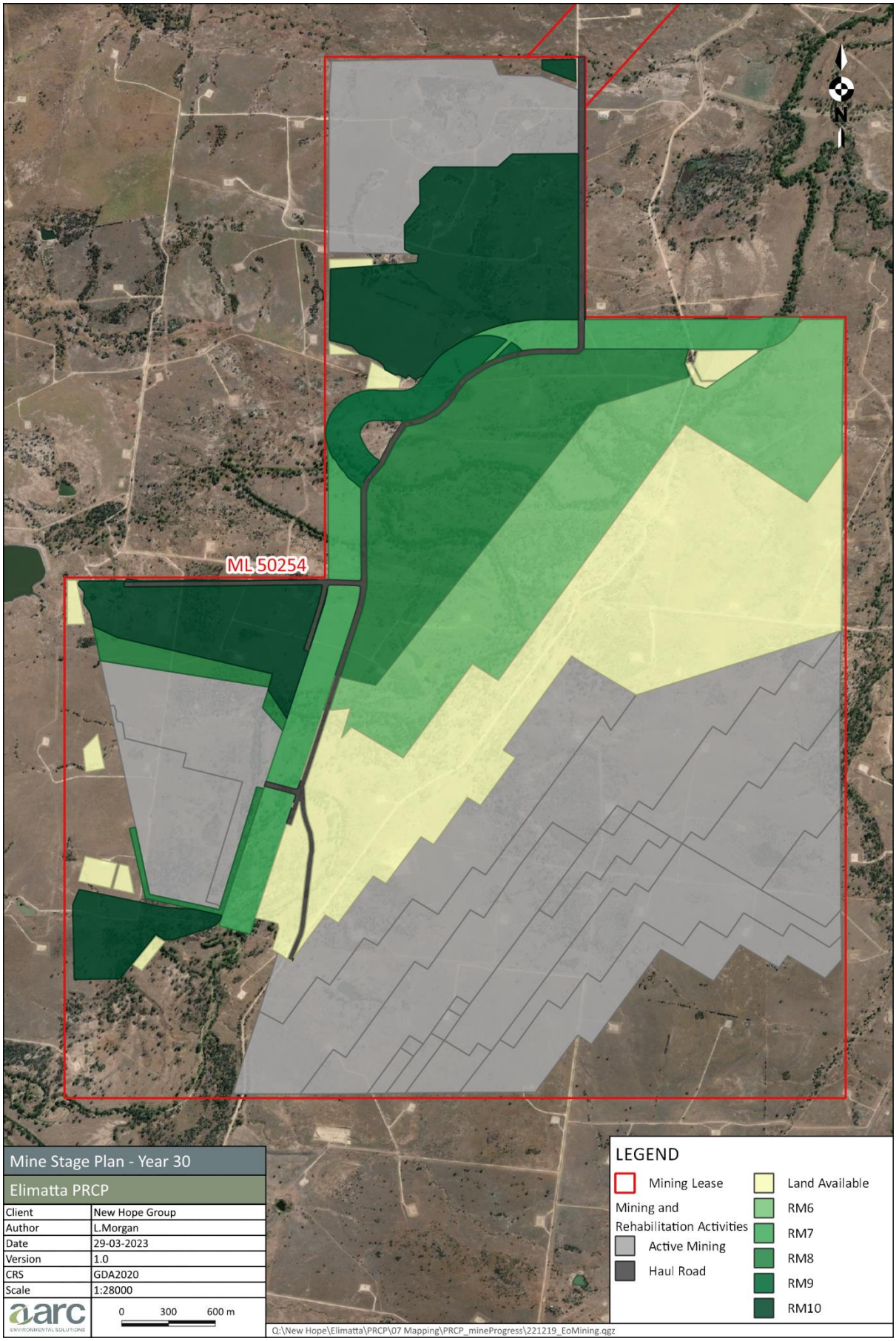

N
ML 50254
Mine Stage Plan - Year 5
Elimatta PRCP
Client | New Hope Group
Author | L.Morgan
Date | 29-03-2023
Version | 1.0
CRS | GDA2020
Scale | 1:28000
arc ENVIRONMENTAL SOLUTIONS
0 300 600 m
LEGEND
Mining Lease
Mining and Rehabilitation Activities
Active Mining
Haul Road
Land Available
RM5
Water Management
Raw Water Dam
Environmental Dam
Sediment Dam
Creek Diversion
Levee
Q:\New Hope\Elimatta\PRCP\07 Mapping\PRCP_mineProgress\221219_EoMining.qgz

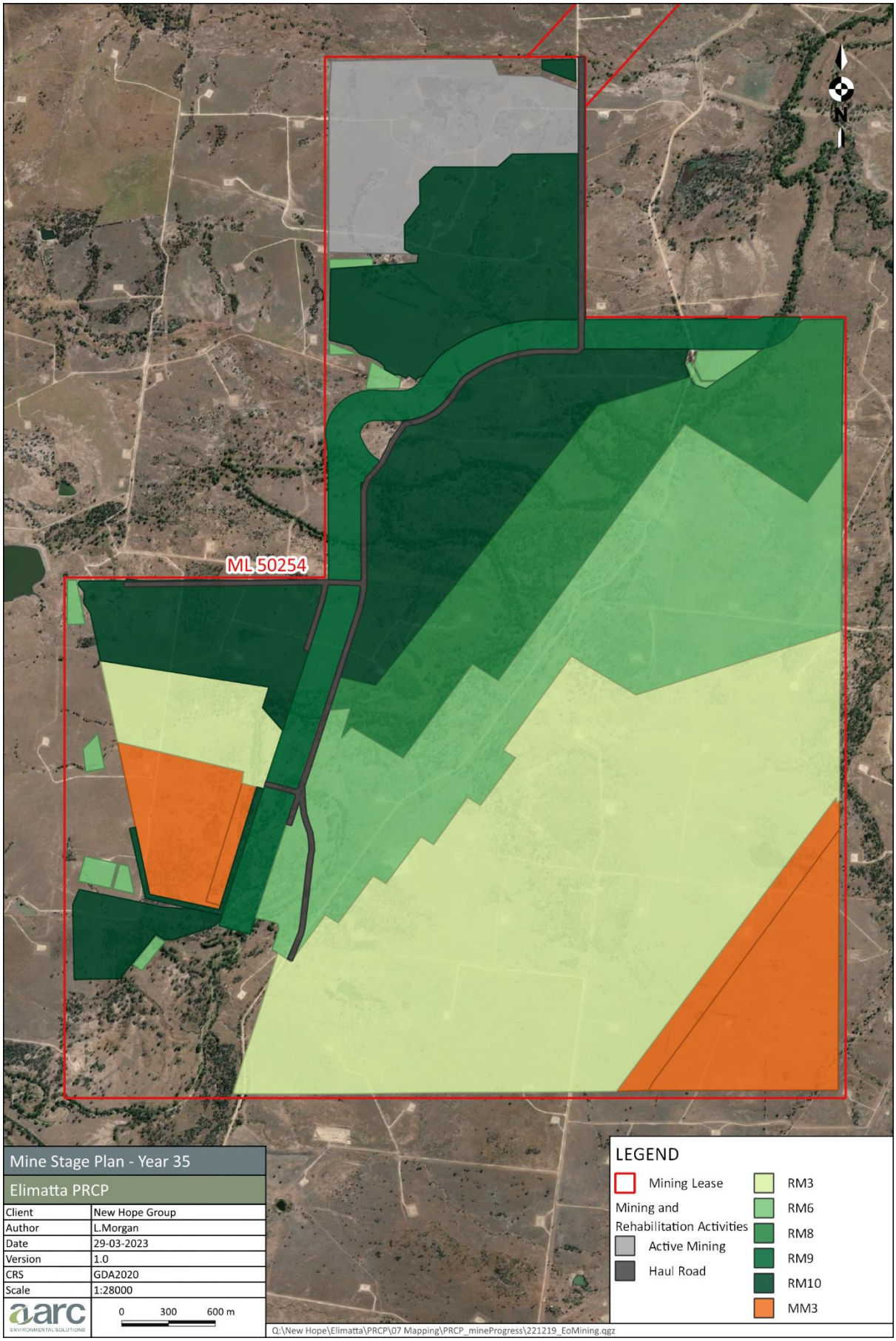

N
ML 50254
Mine Stage Plan - Year 10
Elimatta PRCP
Client | New Hope Group
Author | L.Morgan
Date | 29-03-2023
Version | 1.0
CRS | GDA2020
Scale | 1:28000
arc ENVIRONMENTAL SOLUTIONS
0 300 600 m
LEGEND
Mining Lease
Mining and Rehabilitation Activities
Active Mining
Haul Road
Land Available
RM5
RM6
RM7
Water Management
Raw Water Dam
Environmental Dam
Sediment Dam
Creek Diversion
Q:\New Hope\Elimatta\PRCP\07 Mapping\PRCP_mineProgress\221219_EoMining.qgz


N
ML 50254
Mine Stage Plan - Year 15
Elimatta PRCP
Client | New Hope Group
Author | L.Morgan
Date | 29-03-2023
Version | 1.0
CRS | GDA2020
Scale | 1:28000
arc ENVIRONMENTAL SOLUTIONS
0 300 600 m
LEGEND
Mining Lease
Year15 Mining and Rehabilitation Activities
Active Mining
Haul Road
Land Available
RM6
RM7
RM8
Water Management
Raw Water Dam
Environmental Dam
Sediment Dam
Levee
Q:\New Hope\Elimatta\PRCP\07 Mapping\PRCP_mineProgress\221219_EoMining.qgz


N
ML 50254
Mine Stage Plan - Year 20
Elimatta PRCP
Client | New Hope Group
Author | L.Morgan
Date | 29-03-2023
Version | 1.0
CRS | GDA2020
Scale | 1:28000
arc ENVIRONMENTAL SOLUTIONS
0 300 600 m
LEGEND
Mining Lease
Mining and Rehabilitation Activities
Active Mining
Haul Road
Land Available
RM6
RM7
RM8
RM10
Water Management
Raw Water Dam
Environmental Dam
Sediment Dam
Q:\New Hope\Elimatta\PRCP\07 Mapping\PRCP_mineProgress\221219_EoMining.qgz


N
ML 50254
Mine Stage Plan - Year 25
Elimatta PRCP
Client | New Hope Group
Author | L.Morgan
Date | 29-03-2023
Version | 1.0
CRS | GDA2020
Scale | 1:28000
arc ENVIRONMENTAL SOLUTIONS
0 300 600 m
LEGEND
Mining Lease
Mining and Rehabilitation Activities
Active Mining
Haul Road
Land Available
RM6
RM7
RM8
RM10
Water Management
Raw Water Dam
Environmental Dam
Sediment Dam
Q:\New Hope\Elimatta\PRCP\07 Mapping\PRCP_mineProgress\221219_EoMining.qgz

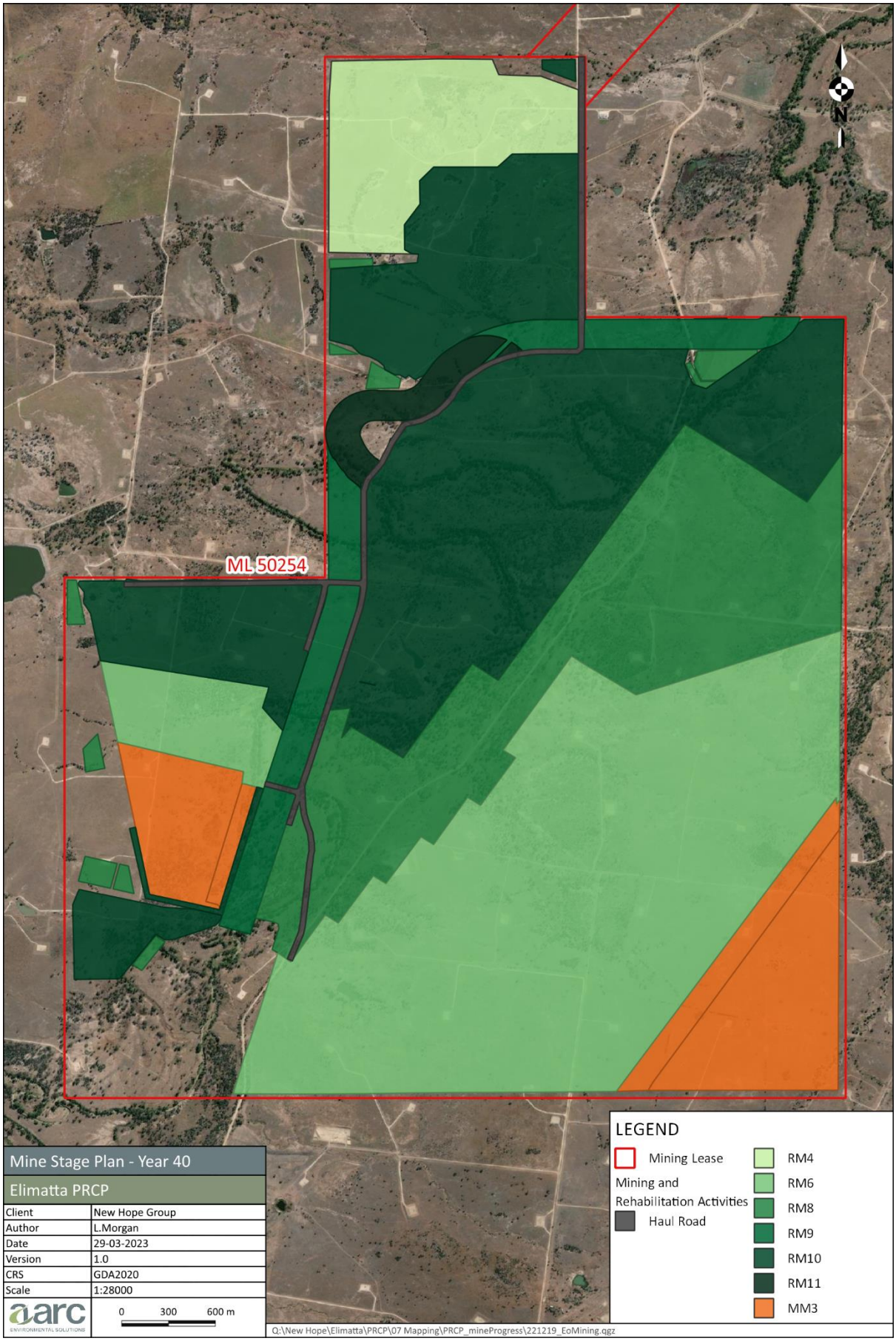

N
ML 50254
LEGEND
Mining Lease
Mining and Rehabilitation Activities
Active Mining
Haul Road
Land Available
RM6
RM7
RM8
RM9
RM10
Mine Stage Plan - Year 30
Elimatta PRCP
Client | New Hope Group
Author | L.Morgan
Date | 29-03-2023
Version | 1.0
CRS | GDA2020
Scale | 1:28000
0 300 600 m
Q:\New Hope\Elimatta\PRCP\07 Mapping\PRCP_mineProgress\221219_EoMining.qgz

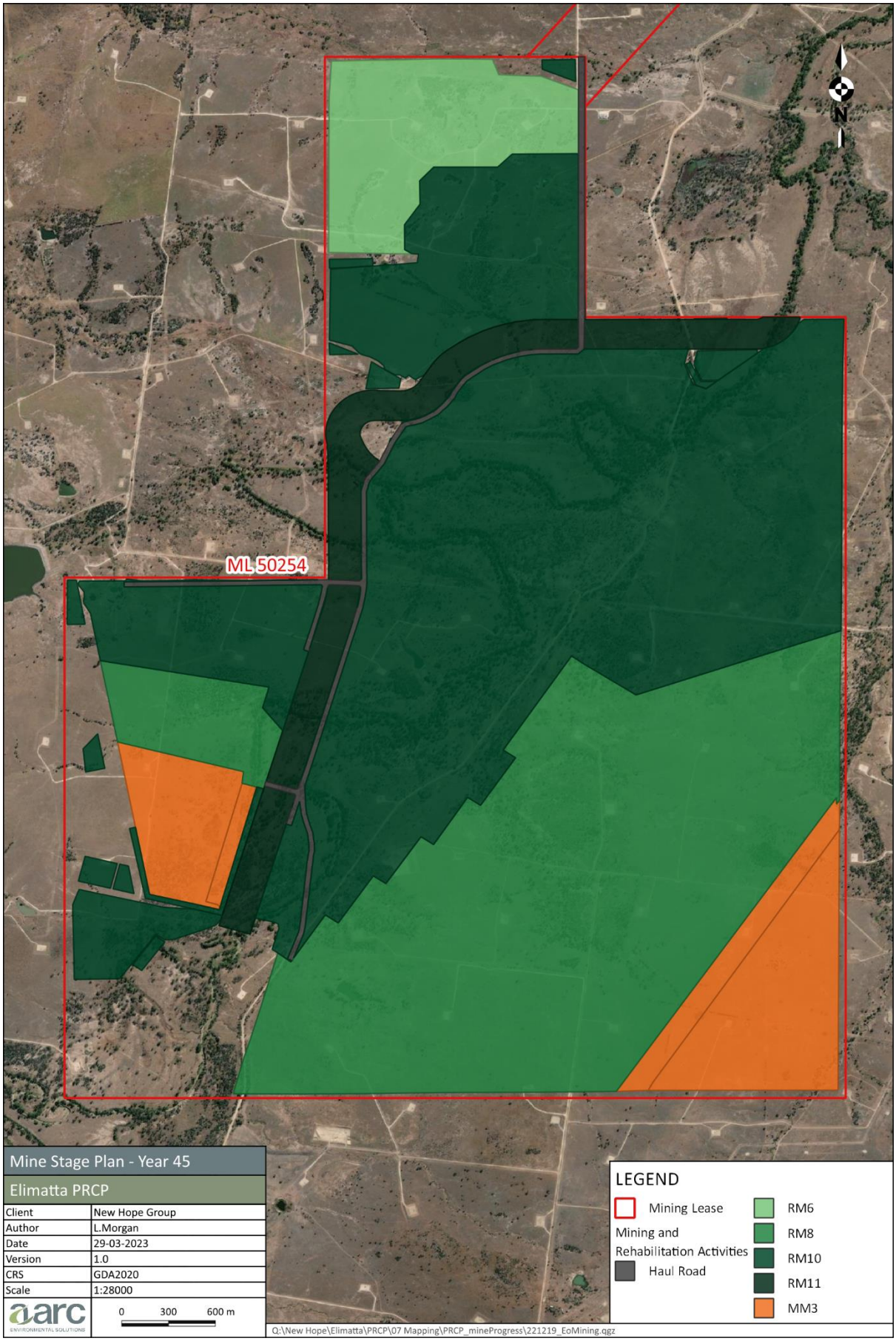


Mine Stage Plan - Year 35

Elimatta PRCP

Client	New Hope Group
Author	L.Morgan
Date	29-03-2023
Version	1.0
CRS	GDA2020
Scale	1:28000


N
ML 50254
LEGEND
Mining Lease
Mining and Rehabilitation Activities
Haul Road
RM4
RM6
RM8
RM9
RM10
RM11
MM3
Mine Stage Plan - Year 40
Elimatta PRCP
Client | New Hope Group
Author | L.Morgan
Date | 29-03-2023
Version | 1.0
CRS | GDA2020
Scale | 1:28000
0 300 600 m
Q:\New Hope\Elimatta\PRCP\07 Mapping\PRCP_mineProgress\221219_EoMining.qgz

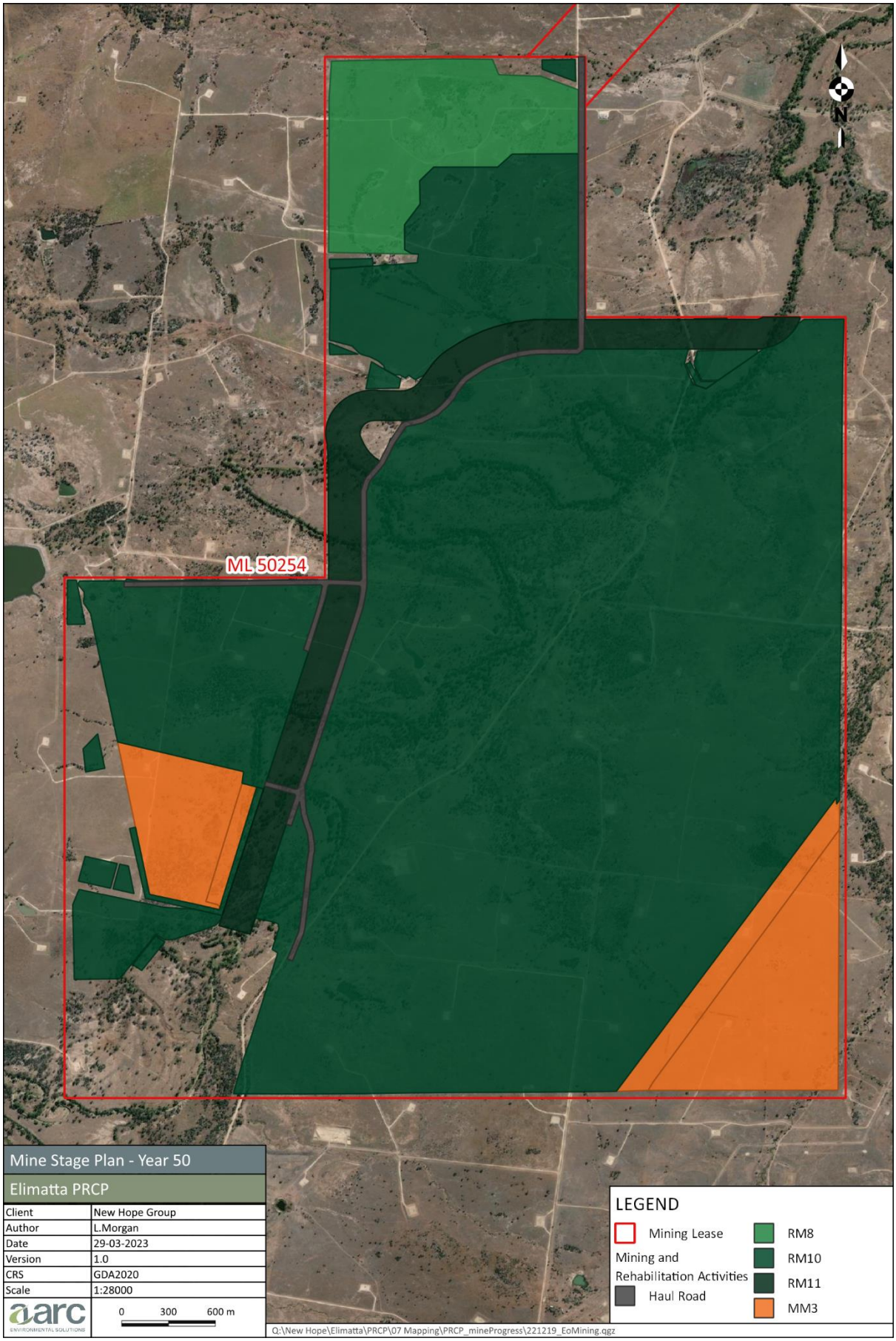


Mine Stage Plan - Year 45

Elimatta PRCP

Client	New Hope Group
Author	L.Morgan
Date	29-03-2023
Version	1.0
CRS	GDA2020
Scale	1:28000

Q:\New Hope\Elimatta\PRCP\07 Mapping\PRCP_mineProgress\221219_EoMining.qgz


N
ML 50254
Mine Stage Plan - Year 50
Elimatta PRCP
Client | New Hope Group
Author | L.Morgan
Date | 29-03-2023
Version | 1.0
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Mining and Rehabilitation Activities
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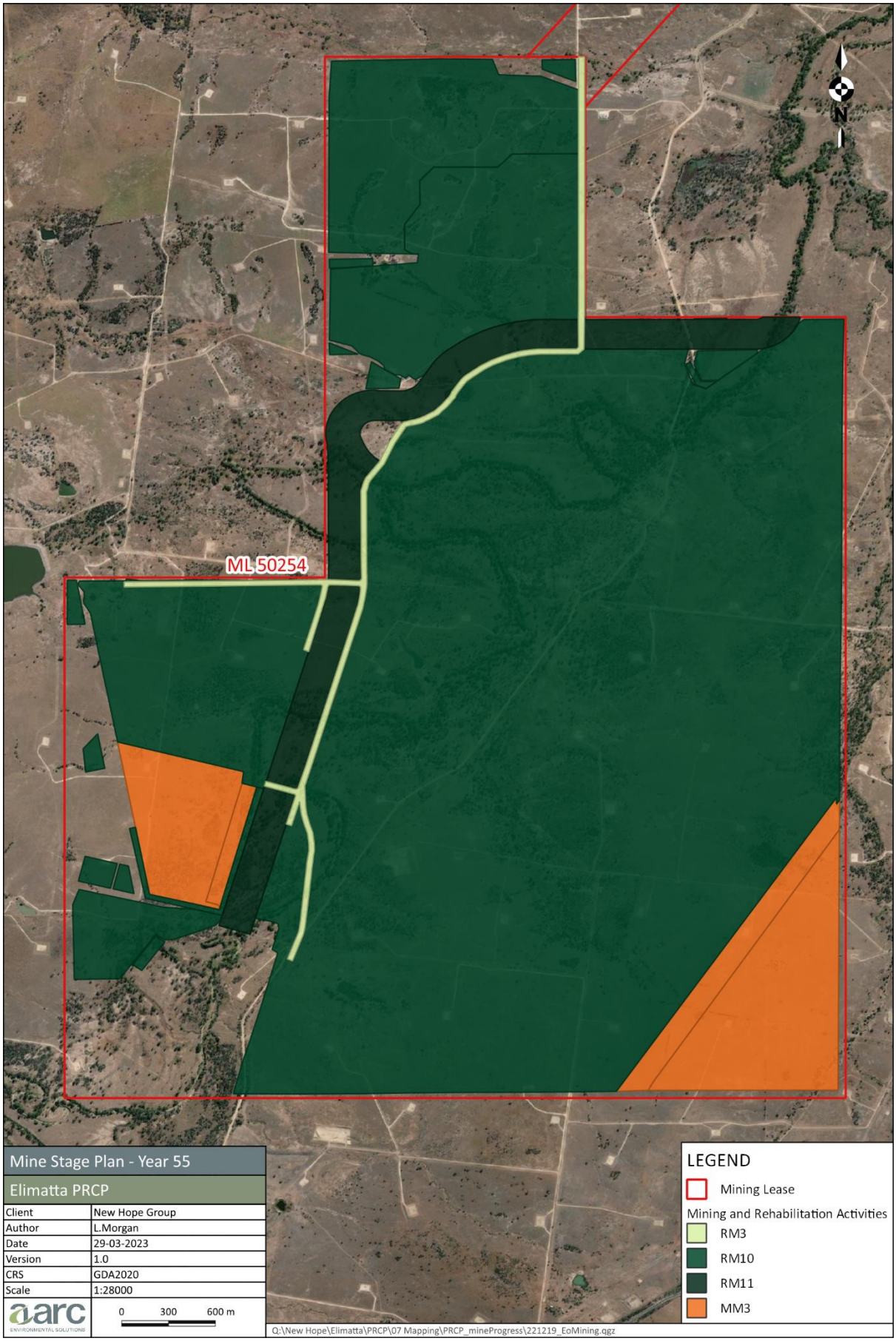
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Elimatta PRCP
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Author | L.Morgan
Date | 29-03-2023
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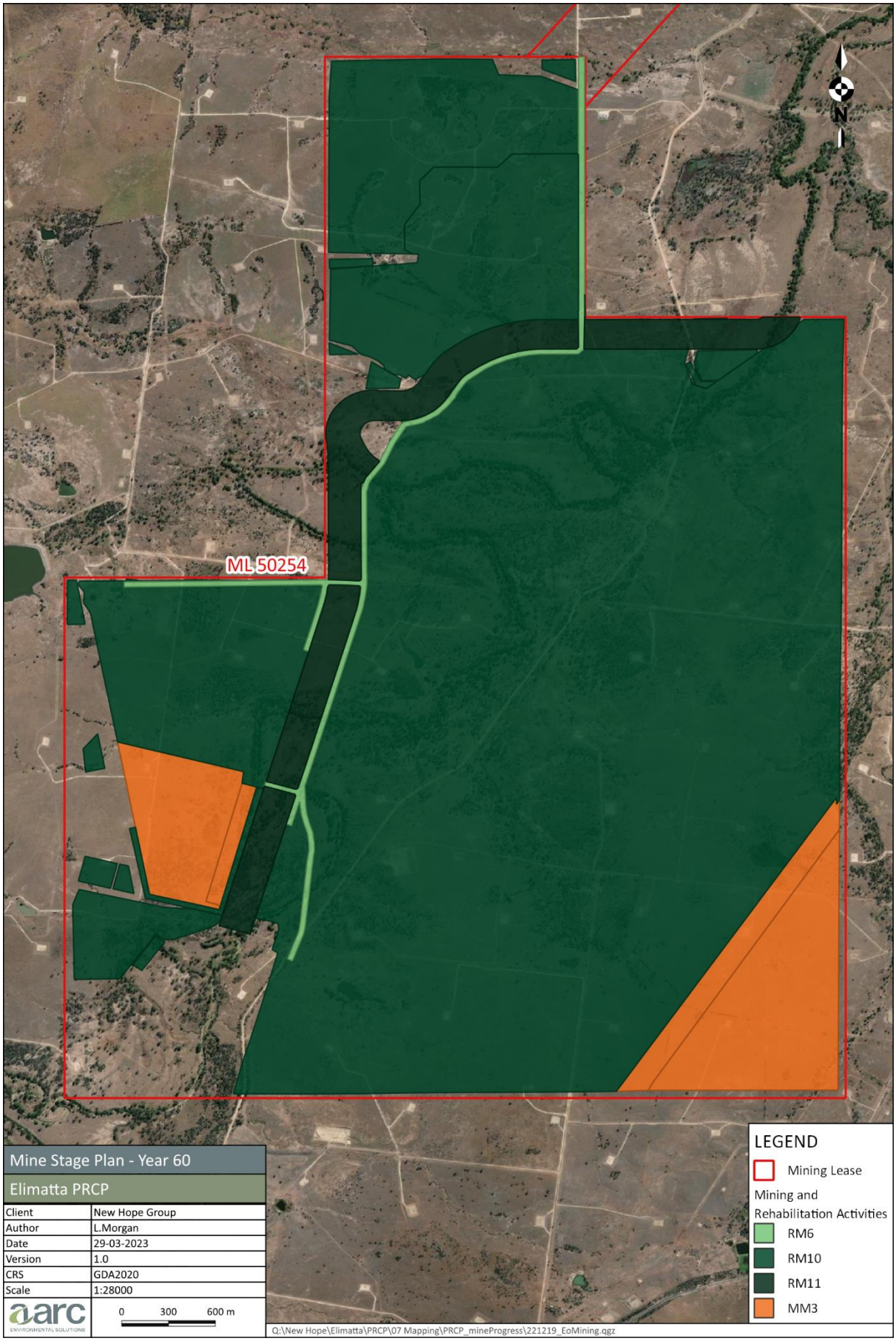
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Mining Lease
Mining and Rehabilitation Activities
RM6
RM10
RM11
MM3
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Elimatta PRCP
Client | New Hope Group
Author | L.Morgan
Date | 29-03-2023
Version | 1.0
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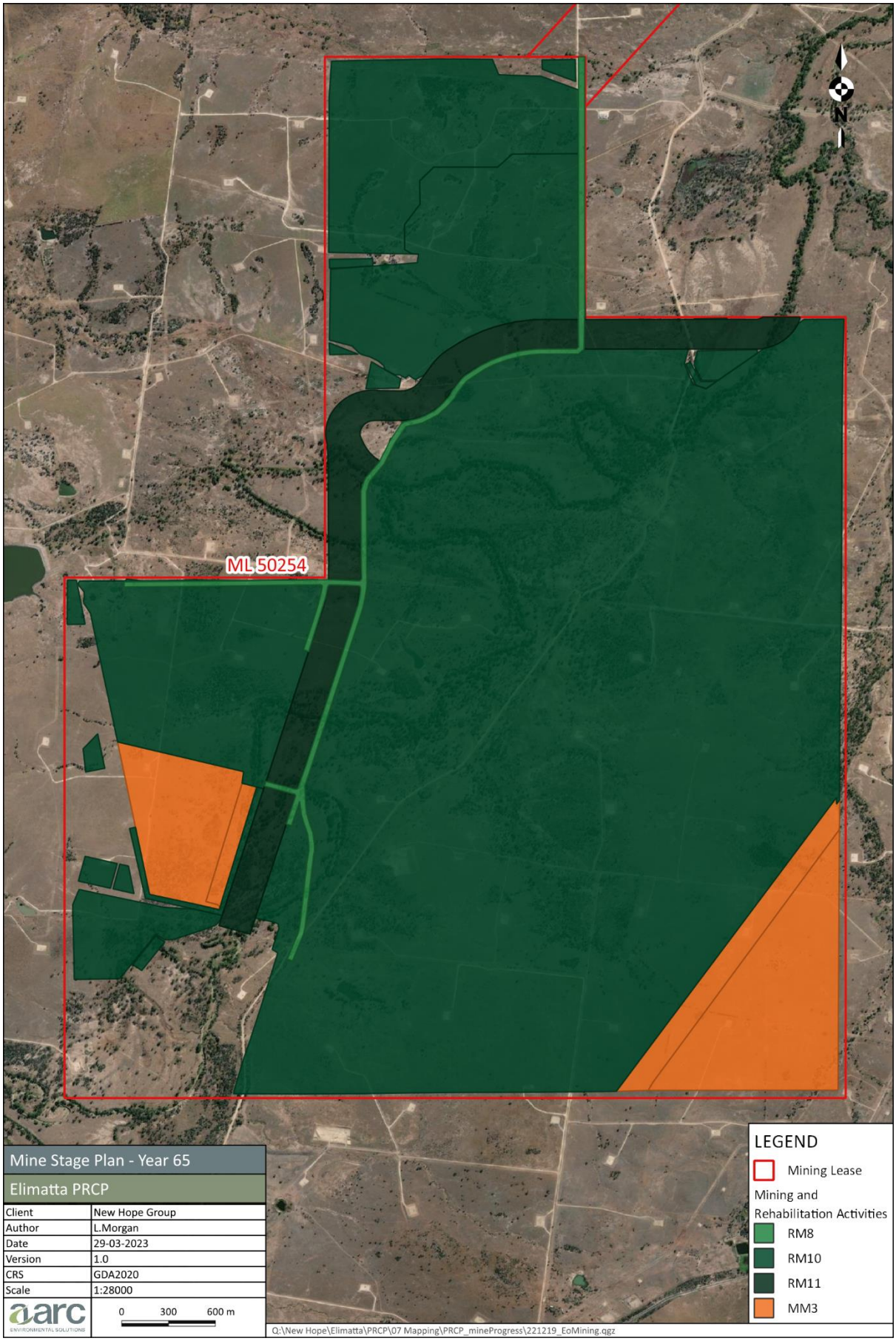
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ML 50254
LEGEND
Mining Lease
Mining and Rehabilitation Activities
RM8
RM10
RM11
MM3
Mine Stage Plan - Year 65
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Client | New Hope Group
Author | L.Morgan
Date | 29-03-2023
Version | 1.0
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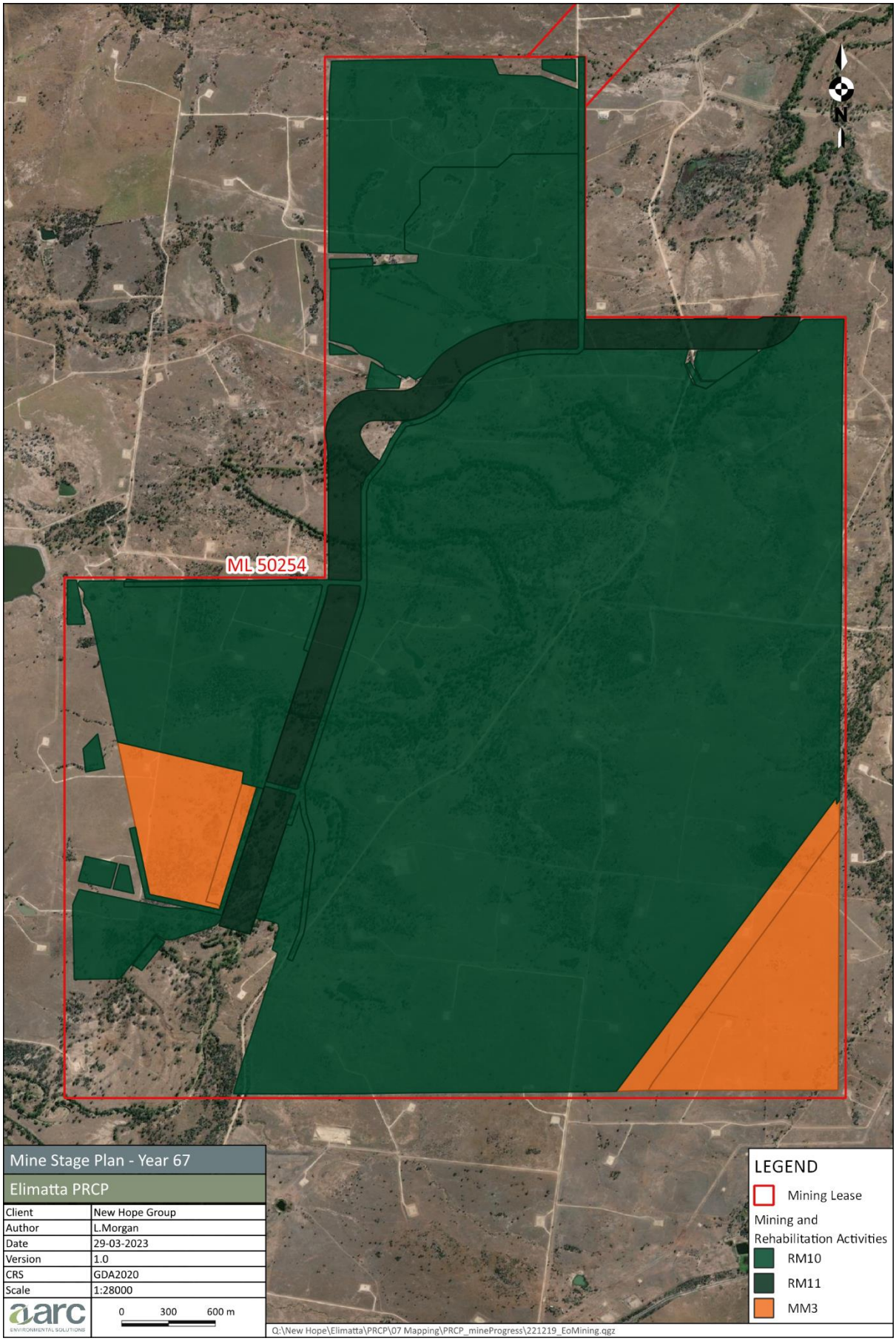
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ML 50254
Mine Stage Plan - Year 67
Elimatta PRCP
Client | New Hope Group
Author | L.Morgan
Date | 29-03-2023
Version | 1.0
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Mining and Rehabilitation Activities
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Appendix D. Stakeholder Engagement Plan

ELIMATTA COAL MINE
LOCAL STAKEHOLDER MANAGEMENT PLAN

PREPARED FOR
NEW HOPE GROUP

30 MARCH 2023

aarc
ENVIRONMENTAL SOLUTIONS

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Document Control

Project Name:	Elimatta Coal Mine
Report Title:	Local Stakeholder Management Plan
Client:	New Hope Group
Project Manager:	Stuart Ritchie

Version	Comments	Author	Reviewer	Date
Draft issued for client review		NW	SR	18 November 2022
Final issued to client		NW	SR	30 March 2023

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1 Introduction

The New Hope Group (NHG) is committed to developing and maintaining successful partnerships and working relationships with the people impacted both directly and indirectly by our operations. Good communication and stakeholder engagement is crucial to sustaining positive and enduring relationships based on trust and mutual benefit, and in turn building acceptance, support and a 'social licence to operate' within our communities.

To date, the NHG has undertaken significant community and stakeholder engagement as part of the 2014 Environmental Impact Statement (EIS). Stakeholder engagement has included interactive processes, in which stakeholders and the community have been engaged as active partners.

The Local Stakeholder Management Plan (LSMP) is targeted for residents within the vicinity of the Project potentially affected by social and environmental impacts, and includes:

- impacts management;
- consultation strategies; and
- complaints resolution.

This LSMP outlines the NHG's approach to stakeholder engagement and community consultation with its near neighbours, as well as the NHG's complaints handling process. The aim of the LSMP is to ensure that impacts and concerns raised by residents and their suggested mitigation measures are considered, by facilitating open communication and active complaint resolution.

2 Project Background

The Elimatta Coal Mine (the Project) is a proposed open cut coal mine located approximately 45 kilometres (km) southwest of the township of Taroom in Southern Queensland and approximately 380 km northwest of Brisbane (Figure 1 and Figure 2). The Project is planned to mine up to 8.2 million tonnes per annum (Mtpa) of ROM coal to produce on average 5 Mtpa of product coal for export.

Based on an assessment of the available resource for the Environmental Impact Statement (EIS) (AARC 2014), the expected production life of the Project is in excess of 32 years. Including construction through to decommissioning, the whole-of-project life is near to 40 years.

The Project encompasses three Mining Leases (MLs), including ML 50354, ML 50270, and ML 50271. ML 50254 will contain the proposed open-cut pit areas and stockpiles, encompassing a total area of 2,779 ha. ML 50270 will consist of the Coal Handling and Processing Plant (CHPP), rail load-out facility and other associated mine infrastructure including tailings storages and an accommodation village. ML 50270 will encompass a total area of 1,075 ha. Linking these two areas, ML 50271 will serve as a transport and services corridor for the transportation of Run-of-Mine (ROM) coal from the pit to the CHPP and will cover a total area of 128 ha. The maximum area proposed to be disturbed across all MLs is 3,982 ha.

A Rail and Services Corridor is also included as part of the Project. This corridor will be a common user corridor and encompass the development of the West Surat Link (WSL) railway, as well as service infrastructure to support the Project. Product coal is to be transported via the WSL to join the Surat Basin Rail (SBR) northeast of the Wandoan township. Product coal will be railed to the planned Wiggins Island Coal Export Terminal (WICET) at Gladstone for export. The development of the Rail and Services Corridor will extend approximately 36 km, with an assumed width of 100 m, covering a total area of approximately 360 ha (Figure 2).

The main disturbance footprints of the Project are:

- Opencut mining over approximately 2,287ha (MLA 50254);
- Out-of-pit stockpiling of spoil over approximately 183ha (MLA 50254);
- Relocation of Horse Creek and Perretts Road from within the mining area (MLA 50254);
- Development of a common user Rail and Services Corridor to service the Project;
- Construction and operation of a CHPP and associated mine infrastructure, including tailings storages and an accommodation village over approximately 340ha (MLA 50270);
- Transportation of ROM coal from the pit to the CHPP via a dedicated haul road (MLA 50271); and
- Rail loading at the project site and transportation of product coal to the WICET in Gladstone.

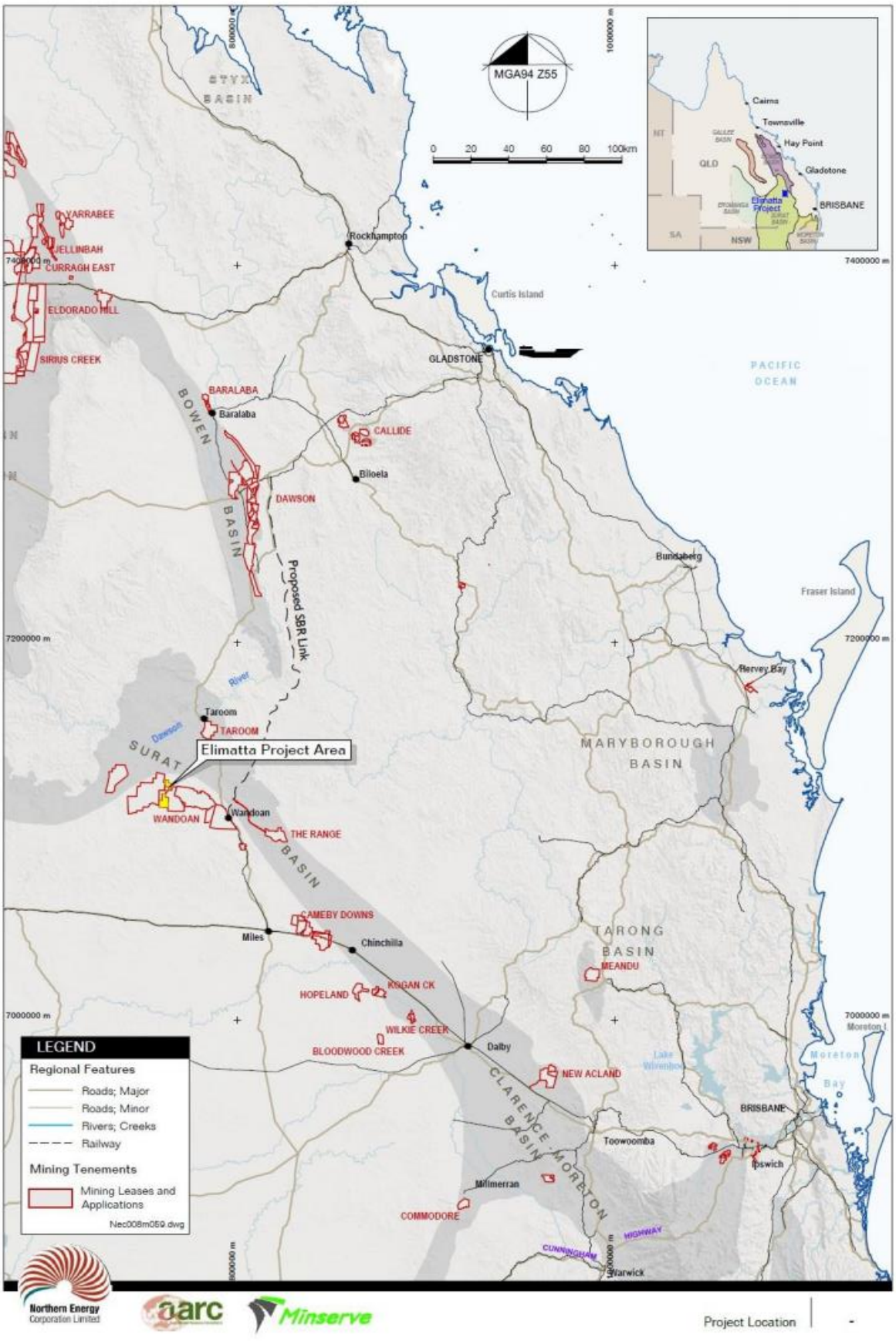

Figure 1: Project locality

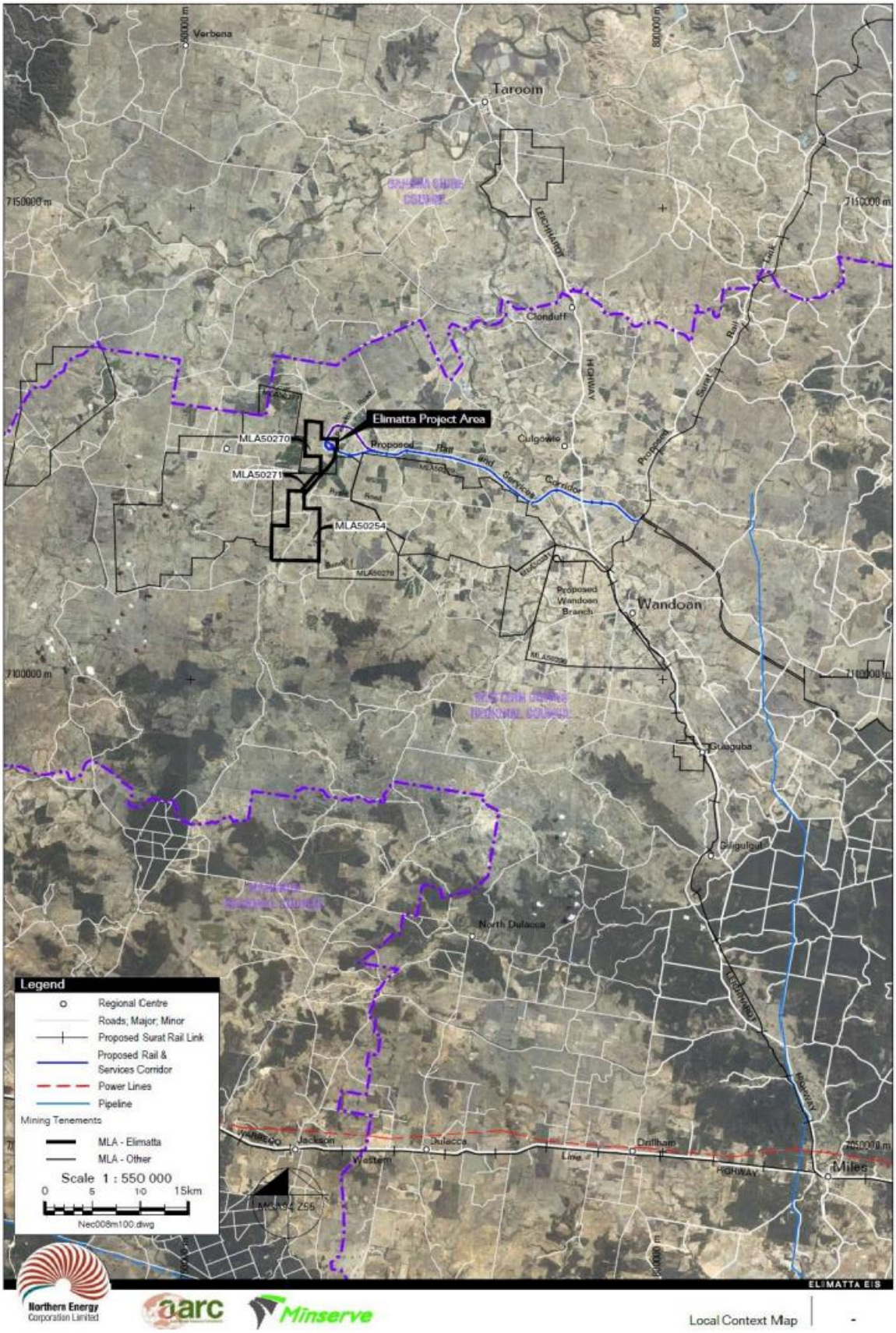

Figure 2: Local context of the Project

3 Local stakeholder engagement

3.1 Engagement approach

The NHG will seek to involve the local community during the planning, construction, operation and decommissioning of the Project. In particular, the NHG will seek to understand and address local community concerns about the environmental and social impacts of the Project's activities. A proactive and open approach to local community engagement will be undertaken as part of the revised Project.

The following key principles will apply to all revised Project engagement and communication:

- a proactive approach to local stakeholder engagement will be applied;
- respect will be shown at all times;
- ensure a two-way conversation between the NHG and the local stakeholders;
- develop local community understanding of the opportunities and benefits of the revised Project;
- maintain regular contact and engagement with the local stakeholders;
- provide feedback to the local stakeholders on how their input has informed decisions; and
- record all significant contact with local stakeholders.

The key local stakeholder groups, their primary interests and the range of engagement mechanisms NHG will use throughout the revised Project are outlined in Table 1.

Table 1: Local stakeholder engagement mechanisms

Stakeholder Group	Primary Interest	Engagement Mechanisms
Local Landholders	• Effects on farming practices and livelihoods • Property acquisition and relocation • Compensation agreements • Community funds and benefits • Property values • Access and connectivity • Social networks and connections • Dust, noise, light & amenity • Traffic • Vegetation clearing • Weeds and Pests	• Individual meetings on affected properties • Community Reference Group • Property acquisition through land valuator • Dedicated Community Liaison Officer • Dedicated project phone number and email address • Personal telephone calls, letters, emails • Quarterly newsletters • Results of environmental monitoring • Community information sessions • Community Investment Fund • Community Sponsorship and Donation Fund • Site tours and neighbours open days

Stakeholder Group	Primary Interest	Engagement Mechanisms
Resident Community	• Job and business opportunities • Education and training opportunities • Community funds and benefits • Community cohesion and social values • Dust and noise • Integration of workforce • Access to social services • Traffic and congestion	• Community information sessions • Community Reference Group • Quarterly community newsletter • Oakey Community Information Office • Dedicated project phone number and email address • Website • Participation in local events • Dedicated Community Liaison Officer • Community Investment Fund • Community Sponsorship and Donation Program • Public site tours • Media releases and local media advertising

3.2 Reporting

The NHG is focussed on ensuring a two-way conversation with stakeholders and the wider community and will actively seek feedback on the revised Project's impacts and benefits. Where possible, the Project team and those responsible for the technical studies will be directly involved in engagement activities and conversations with stakeholders to encourage a responsive approach to feedback. This method also assists in ground truthing study findings and understanding stakeholder's preferred mitigation and management strategies as they are advised and integration of this feedback into the mine plan, rehabilitation strategy and mine decommissioning where relevant.

Community feedback will be used to monitor the effectiveness of the Project's mitigation strategies and action plans. If feedback indicates a need to adjust the mitigation strategies and action plans the following process will be followed:

- community feedback on the mitigation measure will be reviewed further to better understand the issue;
- the feedback will be investigated further through discussions with stakeholders, community members, government agencies and other groups, field investigations, further technical monitoring or data collection as required; and
- following the investigation, recommendations will be made to the New Hope Operations Manager regarding the appropriate course of action. If necessary, Action Plans will be updated as needed and communicated to the relevant personnel for implementation.

The NHG is focussed on ensuring a two-way conversation with stakeholders and the wider community and will actively seek feedback on the revised Project's impacts and benefits.

3.3 Complaint resolution

To facilitate open communication and active complaint resolution, it is important that local stakeholders are able to raise issues and complaints in a formal way. The Project will provide a dedicated Community Liaison Officer with whom local stakeholders can raise issues and concerns relating to the Project.

The Community Liaison Officer is available to receive complaints and can be contacted in person at the Community Information Centre, by email or telephone. The Community Liaison Officer ensures that all issues are conveyed to the appropriate sectors of NHG, including onsite personnel, in the event an issue relates to operational issues.

Concerns and issues raised are recorded and responded to in a timely and consistent manner, and in accordance with regulatory standards and company policies. The following are key principles adhered to by NHG in responding to issues or concerns raised by local stakeholders:

- timeliness – complaints will be dealt with in a timely and efficient manner;
- sensitivity – ensure that both parties feelings and perspectives are respected;
- fairness and impartiality – both parties will be afforded substantive and procedural fairness in the resolution process; and
- confidentiality – only parties directly involved in the complaint or those involved in decision making about outcomes will have access to information about the complaint.

For issues relating to the operating mine, neighbours will be provided with access to senior site personnel via a telephone number which operates 24 hours a day. The operating mine has a process for responding to issues and concerns raised by local stakeholders, consistent with the four key principles listed above.

3.4 Communication protocols

The following Sections detail the NHGs communication protocols for engaging with local stakeholders.

3.4.1 Local stakeholder protocols

When taking telephone or email enquiries from local stakeholders the process outlined in Figure 3 will be applied. This scheme has been adopted from the NHG New Acland Project and will be updated accordingly prior to Project commencement.

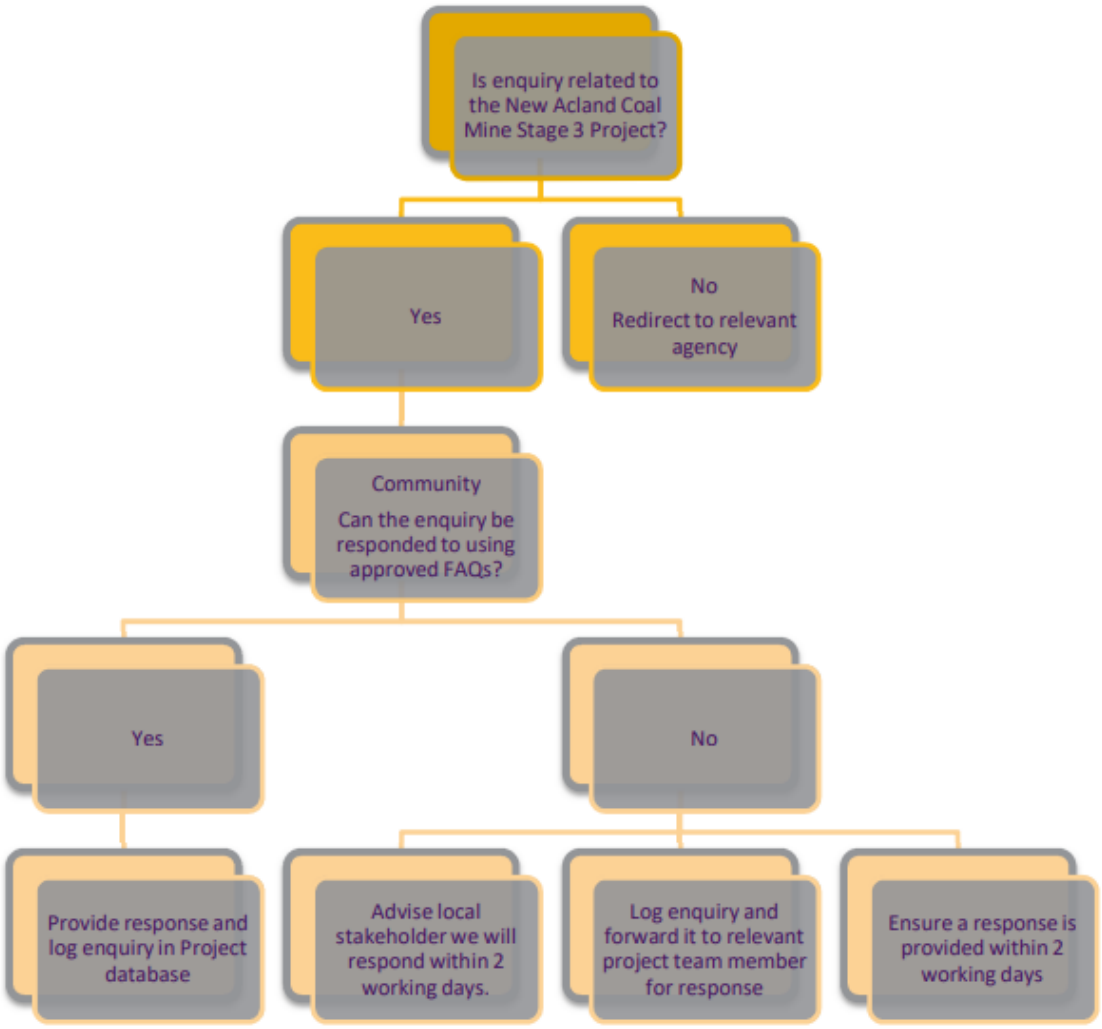

Figure 3: Telephone and email enquiries process

3.4.2 Landowner protocols

Management of local landowner relationships will be managed by the NHG staff. Field staff will be provided with Record of Contact forms for times when informal contact is made. Discussions with landowners will be recorded in Consultation Manager.

4 Evaluation methods

It will be critical to continually monitor and evaluate the effectiveness of the communication and engagement program with the local stakeholders in order to ensure impacts and concerns raised are considered and acted upon where appropriate.

4.1 Evaluation methods

A number of methods will be used to evaluate the effectiveness of the engagement program with local stakeholders. These methods include:

- **Database records**: Database records with an analysis of feedback forms submitted, website hits, telephone calls, incoming emails, tone of enquiries and key issues raised.
- **Benchmarking activities**: Benchmarking activities will be undertaken using questions on any feedback forms and activities to determine changes in local community attitude, knowledge and behaviours.
- **Informal feedback**: All significant informal feedback received from local stakeholders regarding consultation activities will be recorded in the revised Project database and reported and analysed.
- **Observations**: Team members will record their observations during local stakeholder engagement activities. These observations will detail what happened during the activity, who was involved and how they reacted. Team members will also record 'stand out moments' and quotes.
- **Media analysis**: Analysis of negative versus positive media coverage.

4.2 Evaluation criteria

The evaluation criteria for each objective are identified in Table 2.

Table 2: Evaluation criteria

Objective	Method of evaluation	Key indicators
1. Inform local stakeholders about revised Project benefits and opportunities	• Database records • Benchmarking activities • Informal feedback • Observations • Media analysis	• Level of local stakeholder awareness of the revised Project • Information disseminated as per this strategy
2. Provide open, honest and timely communication with local stakeholders	• Database records • Benchmarking activities • Informal feedback	• Amount of communication with local stakeholders and its effectiveness • Local stakeholders satisfaction levels with the revised Project communication • Response times to local stakeholder enquiries
3. Engage local stakeholders to capture their views and ensure they are understood by the revised Project team and considered in decision making where possible	• Database records • Benchmarking activities • Informal feedback • Observations •	• Amount of feedback received and how it has been acted upon • How and if local stakeholder feedback is successfully communicated to the revised Project team
4. Ensure early identification of potential local stakeholder issues and implementation of appropriate mitigation strategies	• Database records • Benchmarking activities • Observations •	• How feedback has been acted upon • How local stakeholders have influenced Project decisions and mitigation measures

5 Contact

5.1 Community liaison officer

A community liaison officer will be appointed prior to the commencement of the mining activities and contact details provided.

5.2 Corporate land and tenure team

The Corporate Land and Tenure team are based in the NHG offices in Brisbane. Contact details are as follows:

- **Email**: property@newhopegroup.com.au
- **Phone**: (07) 3418 0547

5.3 Corporate community team

The Corporate Community team are based in the NHG offices in Brisbane. Contact details are as follows:

- **Email**: community@newhopegroup.com.au
- **Phone**: (07) (07) 3418 0500 or 1800 882 142

5.4 Elimatta Coal Mine

Contact detailed for the Elimatta Coal Mine will be provided prior to the commencement of the mining activities.

5.5 Media enquiries

For media enquiries, contact details for New Hope's Media Team are as follows:

- **Email**: media@newhopegroup.com.au
- **Phone**: +61 7 3418 0558

Appendix E. Community Consultation Register

Table 3 Consultation Register for the Project

Date	Method of Communication	Brief Description of Consultation	**Stakeholders Involved**** (Name of Organisation/ Person & position in organisation)	Issues Discussed and Actions Taken	Further Actions Required
11 July 2011	Face to face discussion	Landholder Consultation		The stakeholder has concerns about the land being within 3 mining company's tenements and whether all 3 companies will want different parts of the subject land.	No further action
30 January 2012	Phone call	Invitation to community sessions		The stakeholder was called and messages were left requesting confirmation the stakeholder had received the invitation and to call for further information on the subject.	NEC representative to follow up*
8 March 2011	Face to face discussion	Site conditions for drill program		The stakeholder discussed the site conditions for drill program and the restructure of Northern Energy following the takeover of New Hope.	NEC representative to follow up with a call
1 July 2011	Phone call	Landholder consultation		Arrange an onsite meeting with the stakeholder	No further action
16 August 2011	Face to face discussion	Landholder Compensation and Land Access Agreement		The stakeholder was provided with information on land access rights as a landholder, a map showing boreholes to be rehabilitated by NEC and told monetary compensation will be given at a follow up meeting.	No further action
22 September 2011	Face to face discussion	Landholder consultation		The stakeholder signed the standard compensation agreement and waiver of notice of entry.	No further action

Date	Method of Communication	Brief Description of Consultation	**Stakeholders Involved**** (Name of Organisation/ Person & position in organisation)	Issues Discussed and Actions Taken	Further Actions Required
14 October 2011	Phone call	Rehabilitation and outstanding compensation payment.		The stakeholder called NEC to acknowledge the rehabilitation activities on the property's boreholes were going well and to chase an outstanding quarterly compensation payment. The stakeholder was told the payment would be posted to him and a follow up meeting between stakeholder and NEC representatives will be made at the end of the month.	NEC representative to follow up with a meeting
30 January 2012	Phone call	Arrange meeting to discuss social impact assessment		An appointment was made with the stakeholder to discuss the social impact assessment.	No further action
1 February 2012	Face to face discussion	Landholder consultation		The stakeholder raised concerns about impact of mining in regional area and impacts on their property	No further action
13 September 2011	Stakeholder briefing	Elimatta introduction to Department of Transport and Main Roads		NEC to conduct initial planning review of proposed overpass on Leichhardt Highway.	NEC representative to follow up on progress
23 September 2011	Phone call	Landholder consultation		The stakeholder indicated an unwillingness to cooperate with NEC unless offered payment for any activity. A follow up call was made to the stakeholder to arrange an onsite meeting.	NEC representative to follow up
5 November 2011	Phone call	Onsite meeting		Phone call to arrange an onsite meeting	No further action
5 November 2011	Face to face discussion	Land access		The stakeholder vocalised that access to the property would be negotiated if compensation was offered and additional conditions made by the stakeholder were adhered to by NEC.	NEC representative to follow up on land access issues

Date	Method of Communication	Brief Description of Consultation	**Stakeholders Involved**** (Name of Organisation/ Person & position in organisation)	Issues Discussed and Actions Taken	Further Actions Required
24 November 2011	Phone call	Arrange a meeting		The stakeholder declined a meeting when requested by a NEC representative. A phone discussion was conducted and issues for the social impact assessment were recorded.	No further action
5 December 2011	Face to face discussion	Land access		The stakeholder verbally agreed to allow access.	No further action
17 January 2012	Phone Call	Arrange a meeting		The stakeholder agreed to a meeting onsite.	No further action
19 January 2012	Face to face discussion	Alignment options		Meeting to discuss alignment options and other matters	No further action
27 September 2011	Phone call/Email	Impact on QPS		The stakeholder requested information on the economic impact the mining project may have in the Taroom area and requested NEC complete a questionnaire sent by email. NEC emailed the completed questionnaire to the stakeholder.	NEC representative to follow up with a call and email response
28 September 2011	Email	Impact on QPS		Issues raised are in relation to the economic – benefit to community and employment.	No further action
13 September 2011	Stakeholder briefing	Elimatta introduction to Western District Regional Council		The stakeholder raised concerns about the social impact the project may have on the region.	No further action

Date	Method of Communication	Brief Description of Consultation	**Stakeholders Involved**** (Name of Organisation/ Person & position in organisation)	Issues Discussed and Actions Taken	Further Actions Required
5 September 2011	Phone call	Landholder consultation		Initial consultation with stakeholder regarding the project.	NEC representative to follow up with a call to arrange a meeting
23 September 2011	Phone call	Arrange meeting		Phone call to arrange an onsite meeting.	No further action
1 October 2011	Face to face discussion	Landholder consultation		The stakeholder raised concerns about noise and dust from the mining operation.	NEC representative to follow up on land access issues
5 October 2011	Face to face discussion	Land access agreement		The stakeholder raised concerns about the access agreement and needed further clarification on certain issues. NEC offered to contact the stakeholder's Land Access Advisor directly to clarify issues.	NEC representative to address stakeholder concerns and discuss further
12 October 2011	Phone call	Land access agreement		The stakeholder declined in signing a land access agreement. NEC arranged another meeting with the stakeholder for further discussions on the land access issue.	NEC representative to arrange meeting
2 November 2011	Phone call	Land access agreement		The stakeholder continues to have concerns over land access and agrees to a further meeting with NEC.	NEC representative to continue discussion with stakeholder on land access issues
7 November 2011	Phone call	Onsite meeting		Phone call to arrange an onsite meeting	No further action

Date	Method of Communication	Brief Description of Consultation	**Stakeholders Involved**** (Name of Organisation/ Person & position in organisation)	Issues Discussed and Actions Taken	Further Actions Required
8 November 2011	Face to face discussion	Land access agreement		The stakeholder continues to have concerns about the property value and declines access to the property.	NEC representative to continue discussion with stakeholder on land access issues
24 November 2011	Phone call	Social Impact Assessment		A follow up call was made to the stakeholder to arrange a face to face meeting; however the stakeholder declined the meeting but agreed to give feedback over the phone relating to the social impact assessment.	No further action
23 January 2012	Phone call	Realignment of the eastern side of the corridor		The stakeholder discussed concerns of uncertainty for the family and family property as a rumour was circulating that another mining project in the area was possibly being put on hold for 10 years.	No further action
11 July 2011	Face to face discussion	Landholder consultation		Meeting between the stakeholder and the NEC representative was postponed due to time constraints.	NEC representative to reschedule meeting
22 September 2011	Face to face discussion	Landholder consultation		Compensation agreements, land access and land purchasing.	NEC representative to follow up on standard conduct and compensation agreement
27 September 2011	Email	Compensation correspondence		Emailed compensation correspondence	No further action

Date	Method of Communication	Brief Description of Consultation	**Stakeholders Involved**** (Name of Organisation/ Person & position in organisation)	Issues Discussed and Actions Taken	Further Actions Required
11 October 2011	Email	Compensation agreement		NEC emailed compensation agreement to stakeholder with amendments	No further action
21 October 2011	Email	Compensation agreement		Compensation agreement amendments	NEC representative to follow up stakeholders position on compensation agreement changes
26 October 2011	Email	Compensation agreement and land access		Land access denied until compensation agreement changes are sorted between NEC lawyers and stakeholder's lawyers	NEC representative to engage in further discussions with stakeholder
1 November 2011	Email	Conduct and compensation agreement		Email agreement to stakeholder	NEC representative to engage in further discussions with stakeholder
5 November 2011	Face to face discussion	Conduct and compensation agreement		Stakeholder signed standard compensation agreement	No further action
2 December 2011	Phone call	Access for surveying		NEC representative called stakeholder to organise time for work to be carried out on the property	No further action
25 January 2012	Phone call	Rental property		Stakeholder called to discuss offer of rental accommodation to NEC when working on the tenement.	No further action

Date	Method of Communication	Brief Description of Consultation	**Stakeholders Involved**** (Name of Organisation/ Person & position in organisation)	Issues Discussed and Actions Taken	Further Actions Required
30 January 2012	Phone call	Invitation to community session		Phone call to stakeholder to follow up on invitation to community session	No further action
22 September 2011	Phone call	Landholder consultation		Arrange meeting with stakeholder	No further action
27 September 2011	Face to face discussion	Landholder consultation		Amenity – Operation of property	NEC representative to follow up with a call
4 November 2011	Phone call	Landholder consultation		Follow up conversation from previous meeting	NEC representative to follow up with a call and arrange meeting with stakeholder
24 November 2011	Phone call	Social Impact Assessment		Recorded comments and noted issues for Social Impact Assessment (SIA)	No further action
23 January 2012	Face to face discussion	Landholder consultation		Discussion on the possible realignment of the corridor on certain properties	No further action
22 September 2011	Phone call	Landholder consultation		Arrange meeting with stakeholder	No further action
26 September 2011	Face to face discussion	Landholder consultation		Issues raised related to amenity – operation of property	NEC representative to follow up with an onsite meeting
29 September 2011	Face to face discussion	Landholder consultation		Issues discussed related to the operation of property, visual amenity, dust and noise.	NEC representative to arrange for access agreement to be signed

Date	Method of Communication	Brief Description of Consultation	**Stakeholders Involved**** (Name of Organisation/ Person & position in organisation)	Issues Discussed and Actions Taken	Further Actions Required
15 October 2011	Phone call	Land access		Stakeholder agrees to land access	No further action
21 October 2011	Phone call	Ecological investigation		NEC representative informed stakeholder of the completion of the investigation	No further action
5 November 2011	Phone call	Onsite visit		Discussions in relation to main concerns: operation of property, property values, visual amenity, dust and noise.	No further action
6 December 2011	Face to face discussion	Social Impact Assessment		Discussion on impacts of rail corridor and coal mining on the property	No further action
16 January 2012	Phone call	To arrange a meeting		Organised a meeting	No further action
19 January 2012	Face to face discussion	Landholder consultation		Meeting to outline the alternative corridor option. Issues raiser were amenity: operation of property; amenity: property values; operations: rail safety	No further action
11 July 2011	Face to face discussion	Landholder consultation		Stakeholder expresses concerns over property value	NEC representative to follow up on access
22 September 2011	Face to face discussion	Landholder consultation		Discussed land access for water bore drilling and stygofauna sampling	NEC representative to follow up with stakeholder on the project
28 September 2011	Email	Landholder consultation		Follow up email attaching project layout plan for Elimatta, including the concept rail and services route that connects the mine area to the Surat Basin Rail.	NEC representative to follow up with a further meeting

Date	Method of Communication	Brief Description of Consultation	**Stakeholders Involved**** (Name of Organisation/ Person & position in organisation)	Issues Discussed and Actions Taken	Further Actions Required
2 December 2011	Phone call	Access for surveying		Land access to granted by the stakeholder	No further action
30 January 2012	Phone call	Arrange meeting		Phone call to stakeholder to arrange a meeting	No further action
1 February 2012	Face to face discussion	Landholder consultation		Discussion on impacts of project on property and surrounding area	No further action
27 October 2011	Face to face discussion	Brief on Elimatta Project		Meeting with stakeholder to discuss the Elimatta project	No further action
27 January 2012	Face to face discussion	Impact on roads and traffic		Discussion on road and traffic statistics for road networks and highways in the Elimatta precinct	No further action
21 December 2011	Phone call	Project impact on property		Discussion on impacts of project on property	No further action
22 September 2011	Phone call	Landholder consultation		Arrange meeting with stakeholder	No further action
26 September 2011	Phone call	Landholder consultation		Stakeholder advised the meeting has to be postponed	Stakeholder to follow up with a rescheduled time
2 October 2011	Face to face discussion	Landholder consultation		The stakeholder raised the issues of operation of property, property values, visual amenity, dust and noise from rail operations	NEC representative to address issues raised at a further date

Date	Method of Communication	Brief Description of Consultation	**Stakeholders Involved**** (Name of Organisation/ Person & position in organisation)	Issues Discussed and Actions Taken	Further Actions Required
17 October 2011	Face to face discussion	Access agreement and ecological investigations		Deliver the access agreement and explain the ecological investigation to be carried out on the property	No further action
4 November 2011	Phone call	Arrange meeting		Stakeholder agreed to onsite meeting to discuss rail corridor concerns	No further action
5 December 2011	Phone call	Arrange meeting		Discuss concerns about the rail corridor on the stakeholder's property and health issues	No further action
6 December 2011	Face to face discussion	Onsite meeting		Discussion on proposed rail corridor.	No further action
8 December 2011	Phone call	Cancellation of meeting		Stakeholder called to postpone meeting.	NEC representative to follow up with a call and advise when community info sessions would be conducted in Taroom
20 January 2012	Phone call	Arrange meeting		NEC representative phoned and left message requesting the stakeholder call back to arrange a meeting	NEC representative to follow up with stakeholder
21 January 2012	Phone call	Arrange meeting		General discussion on the possibility of a slight alignment adjustment along the eastern end of the corridor	NEC representative to follow up with stakeholder an arrange face to face meeting
29 January 2012	Phone call	Arrange meeting		NEC representative phoned and left message requesting the stakeholder call back to arrange a meeting	NEC representative to follow up with stakeholder

Date	Method of Communication	Brief Description of Consultation	**Stakeholders Involved**** (Name of Organisation/ Person & position in organisation)	Issues Discussed and Actions Taken	Further Actions Required
30 January 2012	Phone call	Invitation to community session		NEC representative phoned and left message wanting to confirm the invitation was received and invited the stakeholder to return the call for further information.	NEC representative to follow up with stakeholder
30 January 2012	Phone call	Arrange meeting		NEC representative phoned and left message wanting to discuss possible options for crossings and/or land purchase	NEC representative to follow up with stakeholder
31 January 2012	Phone call	Arrange meeting		Stakeholder raised concern s about mining lease boundary and compensation	NEC representative to follow up by sending a map and copy of the land access agreement
22 September 2011	Phone call	Landholder consultation		Phone call to stakeholder to arrange meeting on site	No further action
30 September 2011	Face to face discussion	Landholder consultation		Stakeholder raised the issue of property value	NEC representative to continue keeping stakeholder up to date with progress of project
24 November 2011	Phone call	Arrange meeting		Phone call to stakeholder and left message requesting a meeting	NEC representative to follow up with another phone call
22 January 2012	Phone call	Arrange meeting		The stakeholder was informed of a social impact assessment to be carried out by AARC	No further action
30 January 2012	Phone call	Invitation to community session		Phoned and left message to confirm stakeholder received the invitation to the community session. Invited the stakeholder to return my call for further information	NEC representative to follow up with another phone call

Date	Method of Communication	Brief Description of Consultation	**Stakeholders Involved**** (Name of Organisation/ Person & position in organisation)	Issues Discussed and Actions Taken	Further Actions Required
31 January 2012	Phone call	Arrange meeting		Discussion on developments and possible corridor options	No further action
8 December 2011	Face to face discussion	Briefing on Elimatta project		The stakeholder is seeking maximum benefit for the region	No further action
27 January 2012	Face to face discussion	Road and traffic impacts		Meeting to discuss road and traffic impacts.	No further action
11 July 2011	Face to face discussion	Landholder consultation		Stakeholder raised issue of property value	NEC representative to follow up with a phone call
30 January 2012	Phone call	Invitation to community session		Spoke to stakeholder to confirm the invitation was received	No further action
17 October 2011	Email	Elimatta TOR document		A copy of the Elimatta TOR document was emailed to the stakeholder	No further action
12 July 2011	Phone call	Arrange meeting		Arrange meeting to discuss the Elimatta project	No further action
27 September 2011	Email	Land access		Explanation of the land access process and the standard conduct and compensation agreement	NEC representative to follow up on agreement
31 October 2011	Email	Conduct and compensation agreement		Copy of conduct and compensation agreement emailed to stakeholder	NEC representative to follow up with phone call

Date	Method of Communication	Brief Description of Consultation	**Stakeholders Involved**** (Name of Organisation/ Person & position in organisation)	Issues Discussed and Actions Taken	Further Actions Required
22 March 2012	Email	Project status		Stakeholder requested another copy of the map showing proposed works and progress of project	NEC representative to follow up by actioning the requested information
23 September 2011	Face to face discussion	Background of project		Issues raised by the stakeholder were property values and visual amenity	NEC representative to follow up with land access agreement
2 December 2011	Phone call	Land access for rehabilitation		Phone call to stakeholder to discuss access to property to complete rehabilitation	No further action
30 January 2012	Phone call	Invitation to community session		NEC representative attempted to contact stakeholder to confirm invitation was received but the stakeholder was not answering	NEC representative to follow up with another call
22 September 2011	Phone call	Landholder consultation		Phone call to stakeholder to arrange an onsite meeting	NEC representative to call stakeholder the day prior to arranged meeting as a reminder
28 September 2011	Face to face discussion	Landholder consultation		Stakeholder raised issues of operation of property, dust and noise from rail operations	NEC representative to follow up with a phone call regarding a land access agreement
4 October 2011	Phone call	Land access agreement		Phone call to stakeholder to discuss progress of land access agreement	NEC representative to follow up with a phone call regarding a land access agreement
11 October 2011	Phone call	Land access agreement		Phone call to stakeholder to discuss progress of land access agreement	NEC representative to follow up with a phone call regarding a land access agreement

Date	Method of Communication	Brief Description of Consultation	**Stakeholders Involved**** (Name of Organisation/ Person & position in organisation)	Issues Discussed and Actions Taken	Further Actions Required
19 October 2011	Phone call	Land access agreement		Phone call to stakeholder to arrange a meeting to collect the signed land access agreement	No further action
24 October 2011	Face to face discussion	Land access agreement		Visit onsite to collect the signed access agreement from stakeholder	No further action
30 January 2012	Phone call	Invitation to community session		Phone call to stakeholder to confirm the invitation was received.	No further action
8 November 2011	Phone call	Land access agreement		Arrange meeting with stakeholder to drop of access agreement	No further action
9 November 2011	Face to face discussion	Onsite meeting		Deliver access agreement and discuss stakeholder concerns – operation of property, property values, dust, noise and safety of rail operation	No further action
24 November 2011	Phone call	Arrange meeting		Phone call to stakeholder to arrange meeting – no answer	NEC representative to follow up with a phone call
29 November 2011	Phone call	Arrange meeting		Phone call to stakeholder to arrange meeting – no answer	NEC representative to follow up with a phone call
17 January 2012	Phone call	Arrange meeting		NEC representative called and left a message for the stakeholder to arrange a meeting	NEC representative to follow up with a phone call
21 January 2012	Face to face discussion	Proposed alternative corridor		Meeting to discuss the proposed alternative corridor	No further action

Date	Method of Communication	Brief Description of Consultation	Stakeholders Involved** (Name of Organisation/ Person & position in organisation)	Issues Discussed and Actions Taken	Further Actions Required
7 December 2011	Face to face discussion	Impact on health services		Discussion on impact of mine development on health services	No further action
22 September 2011	Phone call	Landholder consultation		Phone call to stakeholder to arrange meeting	NEC representative to follow up with a reminder call for the meeting
2 October 2011	Face to face discussion	Landholder consultation		Stakeholder raised issues on operation of property, visual amenity, dust and noise from rail operation	NEC representative to continue keeping stakeholder informed on project and supervise access
15 October 2011	Phone call	Land access agreement		Left phone message requesting a meeting to deliver land access agreement	NEC representative to follow up another call
18 October 2011	Face to face discussion	Land access agreement and site visit		Stakeholder signed agreement. Discussion with stakeholder on land access to carry out environmental assessment	NEC representative to follow up with land access agreement changes made by stakeholder
8 November 2011	Phone call	Arrange onsite meeting		Phone call to stakeholder to arrange meeting to deliver access agreement	No further action
8 November 2011	Face to face discussion	Onsite meeting		Deliver amended access agreement. Issues raised were operation of property, property values, visual amenity, dust, noise and safety of rail operation	No further action
7 December 2011	Face to face discussion	Impacts of rail corridor		Discussion on impacts of rail corridor and coal mining on the property	No further action

Date	Method of Communication	Brief Description of Consultation	**Stakeholders Involved**** (Name of Organisation/ Person & position in organisation)	Issues Discussed and Actions Taken	Further Actions Required
17 January 2012	Phone call	Arrange meeting		Arranged meeting with the stakeholder	No further action
18 January 2012	Face to face discussion	Alignment of corridor		The stakeholder was informed of social impact assessment to be carried out by AARC, proposed alignment options. Issues raised were amenity: operation of property	No further action
27 January 2012	Face to face discussion	Elimatta project update		Meeting with stakeholders to update them on project details and timelines	No further action
13 September 2011	Face to face discussion	Stakeholder briefing		Introduction of project to stakeholder	No further action
22 September 2011	Phone call	Landholder consultation		Phone call to stakeholder to arrange meeting onsite	NEC representative to follow up with a reminder call
28 September 2011	Face to face discussion	Landholder consultation		Issues raised by the stakeholder were: visual amenity, operations - infrastructure dust, operations - infrastructure noise, operations – mine dust, operations – mine noise, operations – rail dust and noise.	NEC representative to follow up with a phone call
5 October 2011	Face to face discussion	Access agreement		Collected the signed access agreement	NEC representative to follow up with access agreement signed by NEC
15 October 2011	Phone call	Access agreement		Phone call to stakeholder to arrange meeting to deliver signed access agreement and discuss environmental investigations to be carried out by AARC	NEC representative to follow up with field work dates

Date	Method of Communication	Brief Description of Consultation	**Stakeholders Involved**** (Name of Organisation/ Person & position in organisation)	Issues Discussed and Actions Taken	Further Actions Required
7 November 2011	Phone call	Arrange meeting onsite		Phone call to stakeholder to arrange a meeting onsite	No further action
7 November 2011	Face to face discussion	Onsite meeting to discuss concerns		Issued raised by stakeholder were: operation of property, property values, operations – rail dust, noise and safety	No further action
22 November 2011	Phone call	Arrange meeting onsite		Phone call to stakeholder to arrange meeting onsite to discuss concerns or the rail corridor	No further action
7 December 2011	Face to face discussion	Social Impact Assessment		Discussion on impacts of rail corridor and coal mining on property	No further action
16 January 2012	Phone call	Arrange meeting		A message was left inviting the stakeholder to return the NEC representative's phone call to organise a meeting	NEC representative to follow up with a phone call
20 January 2012	Face to face discussion	Proposed alignment option		Issues raised were amenity: operation of property, enmity: visual amenity, operations: rail dust, operations: rail noise.	No further action
14 October 2011	Phone call	Rail corridor		Stakeholder wanted to speak with someone in relation to the proposed railway	NEC representative to follow up with a phone call
19 October 2011	Phone call	Landholder consultation		A message was left inviting the stakeholder to return the NEC representative's phone call or to make contact by email	NEC representative to follow up with a phone call
22 October 2011	Phone call	Landholder consultation		A message was left inviting the stakeholder to return the NEC representative's phone call	NEC representative to follow up with a phone call

Date	Method of Communication	Brief Description of Consultation	**Stakeholders Involved**** (Name of Organisation/ Person & position in organisation)	Issues Discussed and Actions Taken	Further Actions Required
24 October 2011	Phone call	Landholder consultation		Initial discussion about the Elimatta project and arranged an onsite meeting with stakeholder for the access agreement to be signed	NEC representative to follow up with a phone call to arrange onsite meeting
7 November 2011	Phone call	Arrange meeting onsite		Phone call to stakeholder to arrange an initial onsite meeting. No one was home and a message was left for the stakeholder to call back.	NEC representative to follow up with a phone call to arrange onsite meeting
28 November 2011	Phone call	Arrange meeting onsite		Spoke to stakeholder and arranged an onsite meeting	No further action
7 December 2011	Phone call	Cancel meeting		NEC representative left messages on land line and mobile phone of stakeholder to cancel onsite meeting due to rain and road closures	NEC representative to follow up with a phone call to arrange onsite meeting
28 November 2011	Phone call	Arrange meeting		Phone call to stakeholder to arrange meeting	No further action
7 December 2011	Face to face discussion	Stakeholder briefing		Recorded comments and noted issues for SIA	No further action
7 December 2011	Face to face discussion	Stakeholder briefing		Recorded comments and noted issues for SIA	No further action

Date	Method of Communication	Brief Description of Consultation	**Stakeholders Involved**** (Name of Organisation/ Person & position in organisation)	Issues Discussed and Actions Taken	Further Actions Required
17 August 2011	Face to face discussion	Landholder compensation and access agreement		Discussion on access agreements and compensation	NEC representative to follow up with an onsite meeting
7 September 2011	Face to face discussion	Landholder consultation		Issues raised were: business – ownership of site	NEC representative to follow up on issues raised
30 January 2012	Phone call	Invitation to community session		Phone call to stakeholder to confirm the invitation to community session was received.	NEC representative to follow up with a phone call
12 July 2011	Face to face discussion	Landholder consultation		Discussion on Elimatta project and property value	No further action
6 December 2011	Email	Rental property		Email from stakeholder offering the use of a rental property to NEC	NEC representative to follow up with an email
6 December 2011	Email	Re: Rental property		Further discussion on rental property and process	No further action
22 September 2011	Phone call	Landholder consultation		Phone call to stakeholder to arrange an onsite meeting	No further action
3 October 2011	Face to face discussion	Landholder consultation		Issues raised by the stakeholder were: Amenity – operation of property, property values and visual amenity; operations –infrastructure dust and noise; operations – mine dust and noise; operations – rail dust and noise. Land access agreements	NEC representative to follow up with collecting the signed access agreement

Date	Method of Communication	Brief Description of Consultation	**Stakeholders Involved**** (Name of Organisation/ Person & position in organisation)	Issues Discussed and Actions Taken	Further Actions Required
15 October 2011	Phone call	Access agreement		Phone call to arrange meeting to deliver signed access agreement and explain access is required for environmental investigations	NEC representative to follow up with a phone call to discuss field schedule
4 November 2011	Phone call	Arrange meeting onsite		Phone call to stakeholder to arrange an onsite meeting	No further action
6 November 2011	Face to face discussion	Onsite meeting		Issues raised by the stakeholder were: amenity – operations of property, property values and visual amenity; operations – rail dust, noise and safety	No further action
7 December 2011	Face to face discussion	Impacts of rail corridor		Discussion on impacts of rail corridor and coal mining on property	No further action
20 January 2012	Phone call	Arrange meeting		NEC representative left message for stakeholder to call and arrange a meeting	NEC representative to follow up with a phone call
21 January 2012	Phone call	Arrange meeting		NEC representative left message for stakeholder to call and arrange a meeting	NEC representative to follow up with a phone call
22 January 2012	Face to face discussion	Proposed corridor		Discussion on the proposed corridor and how it will affect the stakeholder. Stakeholder was informed of the social impact assessment to be carried out by AARC	No further actin

Date	Method of Communication	Brief Description of Consultation	**Stakeholders Involved**** (Name of Organisation/ Person & position in organisation)	Issues Discussed and Actions Taken	Further Actions Required
6 December 2011	Face to face discussion	Stakeholder briefing		Discussion on impacts of coal mining and gas development	No further action
2 December 2011	Email	Fuel Supply		Stakeholder would like to quote for fuel supply requirements.	No further action
12 July 2011	Face to face discussion	Landholder consultation		Discussion on Elimatta project and concerns about property	No further action
28 November 2011	Phone call	Arrange meeting onsite		Stakeholder currently out of Taroom area. Recorded comments and noted issues for SIA	No further action
30 January 2012	Phone call	Invitation to community session		Attempted to contact stakeholder to confirm the invitation to community session was received	NEC representative to follow up with a phone call
22 September 2011	Phone call	Landholder consultation		Phone call to arrange a meeting onsite with stakeholder when in Taroom	NEC representative to phone call stakeholder to arrange a meeting
26 September 2011	Phone call	Arrange meeting onsite		Phone call to arrange a meeting onsite with stakeholder when in Taroom	No further action

Date	Method of Communication	Brief Description of Consultation	**Stakeholders Involved**** (Name of Organisation/ Person & position in organisation)	Issues Discussed and Actions Taken	Further Actions Required
3 October 2011	Face to face discussion	Initial meeting		Issues raised by the stakeholder were: amenity – operation of property and visual amenity; operations – infrastructure dust and noise; operations – mine dust and noise; operations – rail dust and noise	NEC representative to follow up with a phone call to discuss content of access agreement
13 October 2011	Phone call	Access agreement		Phone conversation with the stakeholder to chase up the access agreement and to discuss possible access for the upcoming environmental investigations	NEC representative to follow up with a phone call to discuss the access agreement
19 October 2011	Phone call	Access agreement		Follow up call to discuss the progress of the access agreement from the stakeholder	NEC representative to follow up with a phone call to discuss the access agreement
21 January 2012	Phone call	Arrange meeting		Left voice message for stakeholder to contact NEC representative to arrange a meeting	NEC representative to follow up with a phone call
22 January 2012	Phone call	Project status and arrange meeting		Discussion on corridor alignment and inform stakeholder of social impact assessment to be carried out by AARC	No further action
12 July 2011	Face to face discussion	Landholder consultation		Discussion on impacts of project on property	No further action
8 December 2011	Face to face discussion	Stakeholder briefing		Briefing on Elimatta project and discussion on stakeholder's expectations of how the project will impact the community	No further action
1 February 2012	Face to face discussion	Landholder consultation		Discussion on impacts of project on property	No further action

Date	Method of Communication	Brief Description of Consultation	**Stakeholders Involved**** (Name of Organisation/ Person & position in organisation)	Issues Discussed and Actions Taken	Further Actions Required
2 February 2012	Face to face discussion	Stakeholder consultation		Discussion on impacts of project on the local area	No further action
6 February 2012	Face to face discussion	Stakeholder consultation		Discussion on impacts of project on the local area	No further action
6 February 2012	Face to face discussion	Stakeholder consultation		Discussion on impacts of project on the local area	No further action
14 February 2012	Phone call	Stakeholder consultation		Discussion on current policing issues and potential issues from potential expanded resources sector	No further action
14 February 2012	Face to face discussion	Stakeholder consultation		Discussion on impacts of project on the local area	No further action
14 February 2012	Face to face discussion	Stakeholder consultation		Discussion on impacts of project on the local area	No further action
14 March 2012	Phone call	Stakeholder consultation		Discussion on current policing issues and potential issues from potential expanded resource sector	NEC representative to follow up by sending information on Project background
14 February 2012	Phone call	Stakeholder consultation		Discussion on issues for current regional ambulance services and potential issues from potential expanded resource sector	NEC representative to follow up by sending information on Project background

Date	Method of Communication	Brief Description of Consultation	**Stakeholders Involved**** (Name of Organisation/ Person & position in organisation)	Issues Discussed and Actions Taken	Further Actions Required
15 February 2012	Face to face discussion	Stakeholder consultation		Discussion on impacts of project on the local area	No further action
21 February 2012	Face to face discussion	Stakeholder consultation		Discussion on impacts of project on the local area	No further action
22 February 2012	Face to face discussion	Stakeholder consultation		Discussion on impacts of project on the local area	No further action
26 April 2012	Face to face discussion	Regulator Meeting		Discussion of EIS issues particularly the anticipated approval process for the Rail and Services Corridor.	NEC to decide whether the Rail and Services Corridor forms a component of the Project or not.
03 May 2012	Face to face discussion	Regulator Meeting		Discuss approach for extending timelines to allow the Rail and Services Corridor to be included in the EIS.	Consider options for extension.
09 May 2012	Teleconference	Regulator Meeting		Finalise approach for extending timelines to allow the Rail and Services Corridor to be included in the EIS.	Extension of date for decision on whether or not the EIS can proceed (s49). Extension to the Elimatta Project Terms of Reference.
19 June 2012	Face to face discussion	Regulator meeting		Discussion topics included WICET progress & capacity, regional significance status, multi-user agreements for Rail and Services Corridor, land acquisition.	No further action

Date	Method of Communication	Brief Description of Consultation	Stakeholders Involved** (Name of Organisation/ Person & position in organisation)	Issues Discussed and Actions Taken	Further Actions Required
05 July 2012	Face to face discussion	Regulator meeting		EIS progress update	No further action
25 July 2012	Face to face discussion	Regulator meeting		Discussion of the application of water and dam design guidelines to Elimatta Project	No further action
2 August 2012	Face to face discussion	Consultation with Department of Transport and Main Roads (TMR) and Western Downs Regional Council (WDRC)		Presentation of preliminary Road Impact Assessment for the Elimatta Project and West surat Link Rail Crossings Constructability.	TMR and WDRC to review documents presented and provide feedback to AARC.
3 September 2012	Email Correspondence	Consultation with Department of Transport and Main Roads (TMR)		Response to review of preliminary Road Impact Assessment (RIA).	AARC to incorporate comments into comprehensive RIA.

*Northern Energy Corporation (NEC) acting on behalf of Taroom Coal Pty Ltd (Taroom Coal)
** Stakeholder names have been removed for privacy purposes

Appendix F. Rehabilitation Monitoring and Maintenance Plan

REHABILITATION MONITORING PROGRAM

ELIMATTA COAL MINE

PREPARED FOR
NEW HOPE GROUP PTY LTD

30 MARCH 2023

aarc
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Document Control

Project Name:	**Elimatta Coal Mine**
Report Title:	Rehabilitation Monitoring Program
Client:	New Hope Group Pty Ltd
Project Manager:	Stuart Ritchie

Version	Comments	Author	Reviewer	Date
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1 Introduction

AARC Environmental Solutions Pty Ltd (AARC) has been commissioned by New Hope Group Pty Ltd (NHG) on behalf of Taroom Coal Proprietary Limited to develop a Rehabilitation Monitoring Program (RMP) to guide the monitoring of rehabilitation performance for the Elimatta Coal Mine (the Project). This RMP is applicable to rehabilitation activities associated with Mining Leases (ML) ML 50354, ML 50270, and ML 50271 in accordance with the Project's Environmental Authority (EA) (EPML00443913).

1.1 Purpose

The purpose of the RMP is to guide assessment of the condition of rehabilitated areas through the collection and comparison of quantitative data from rehabilitated and reference sites. Comparison of data from rehabilitated sites against reference sites and post-mine land use criteria is used to assess the performance of rehabilitation works.

The program has been designed to meet the rehabilitation goals, objectives, indicators and criteria defined in the Progressive Rehabilitation and Closure Plan (PRCP) for the Project.

1.2 Scope

This RMP incorporates the following components to ensure sufficient data is collected to assess the progress of the Project's rehabilitation works over time against the identified completion criteria:

- a rehabilitation monitoring design that determines the progress of existing project rehabilitation through quantitative assessments;
- identification of existing reference and rehabilitation monitoring locations and, for all monitoring locations, ensuring that adequate spatial and temporal coverage is established to address the RMP objectives;
- a specified frequency for monitoring events and an overall duration for the rehabilitation monitoring program;
- the definition of sampling methods that are repeatable and comparable over time and between different observers;
- analysis techniques suited to the field monitoring data being collected; and
- reporting on the progress of rehabilitation against the identified rehabilitation objectives and completion criteria for the Project.

1.3 Background

The Project is a proposed open cut coal mine located approximately 45 km southwest of the township of Taroom in southern Queensland and approximately 380 km northwest of Brisbane. The Project is planned to mine up to 8.2 million tonnes per annum (Mtpa) of ROM coal to produce on average 5 Mtpa of product coal for export. Based on an assessment of the available resource for the Environmental Impact Statement (EIS), the expected production life of the Project is in excess of 32 years. Including construction through to decommissioning, the whole-of-project life is expected to be approximately 40 years.

The Project activities will be undertaken across three MLs including ML 50354, ML 50270, and ML 50271; shown in Figure 1. ML 50254 will contain the proposed open-cut pit areas and stockpiles, encompassing a total area of 2,774 ha. ML 50270 will consist of the Coal Handling and Processing Plant (CHPP), rail load-out facility and other associated mine infrastructure including tailings storages and an accommodation village. ML 50270 encompasses a total area of 1,073 ha. Linking these two areas, ML 50271 will serve as a transport and services corridor for the transportation of Run-of-Mine (ROM) coal from the pit to the CHPP and has a total area of 128 ha. The maximum area proposed to be disturbed across all MLs is 3,313 ha.

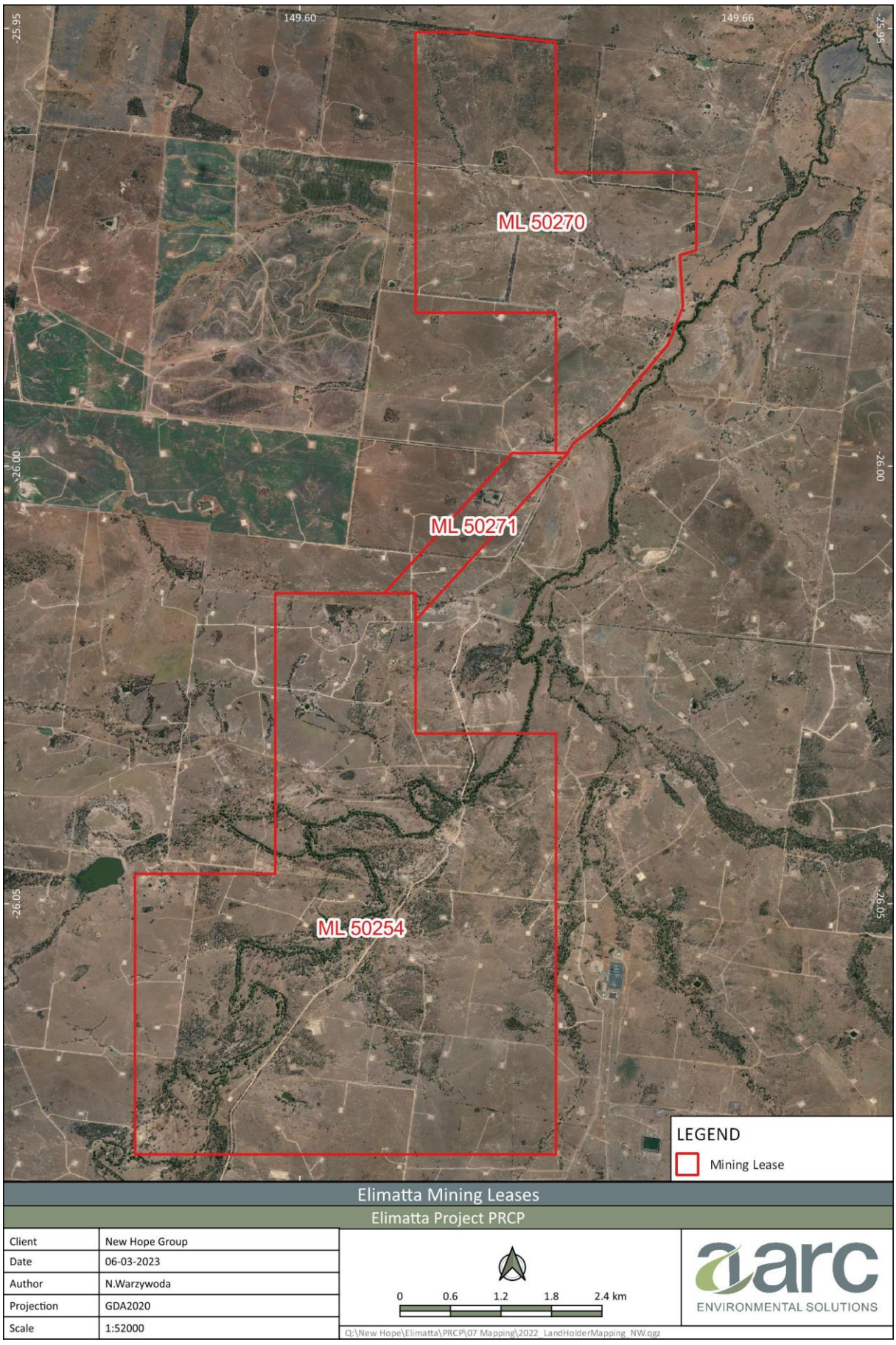

Figure 1: Project mining leases

To allow for the development of the PRCP, discrete rehabilitation areas (RAs) and improvement areas (IAs) have been defined for the Project. An RA is defined in the Environmental Protection Regulation 2019 as an area of land of a specific post-mining land use (PMLU) to which a rehabilitation milestone for the PMLU relates. An IA is defined in the EP Regulation as, for a non-use management area (NUMA), an area of land in the NUMA to which a management milestone for the NUMA relates. Either RAs or IAs have been nominated for areas of disturbance within the Project as shown on Figure 2 and Figure 3, and as summarised in Table 1.

Table 1: Rehabilitation and improvement areas

Rehabilitation Area reference	Mining domain	Description	PMLU
Rehabilitation areas			
RA1	Creek diversion	• Horse Creek diversion (permanent)	Grazing native riparian vegetation
RA2a	Water management infrastructure	• Environmental dams • Sediment dams • Raw water dams	Grazing modified pasture
RA2b		• Retained flood levee	
RA3	Mine infrastructure areas	• Buildings, including foundations • Roads • Chemical/fuel storages • CHPP • Laydown yard • Access/coal haul road and infrastructure corridor • infrastructure corridor linking the MIA to the electrical substation • Pit access road	
RA4	Waste disposal	• Surface TSFs (TDN and TDNA) • In-pit TSF	
RA5	In-pit and out-of-pit spoil dumps	• Out-of-pit waste rock emplacements • In-pit waste rock emplacements	
RA6	Rail and services corridor	• Rail and services corridor and rail balloon loop	Retained infrastructure
Improvement area			
IA1	Residual voids	• Residual voids (eastern and western voids)	NUMA

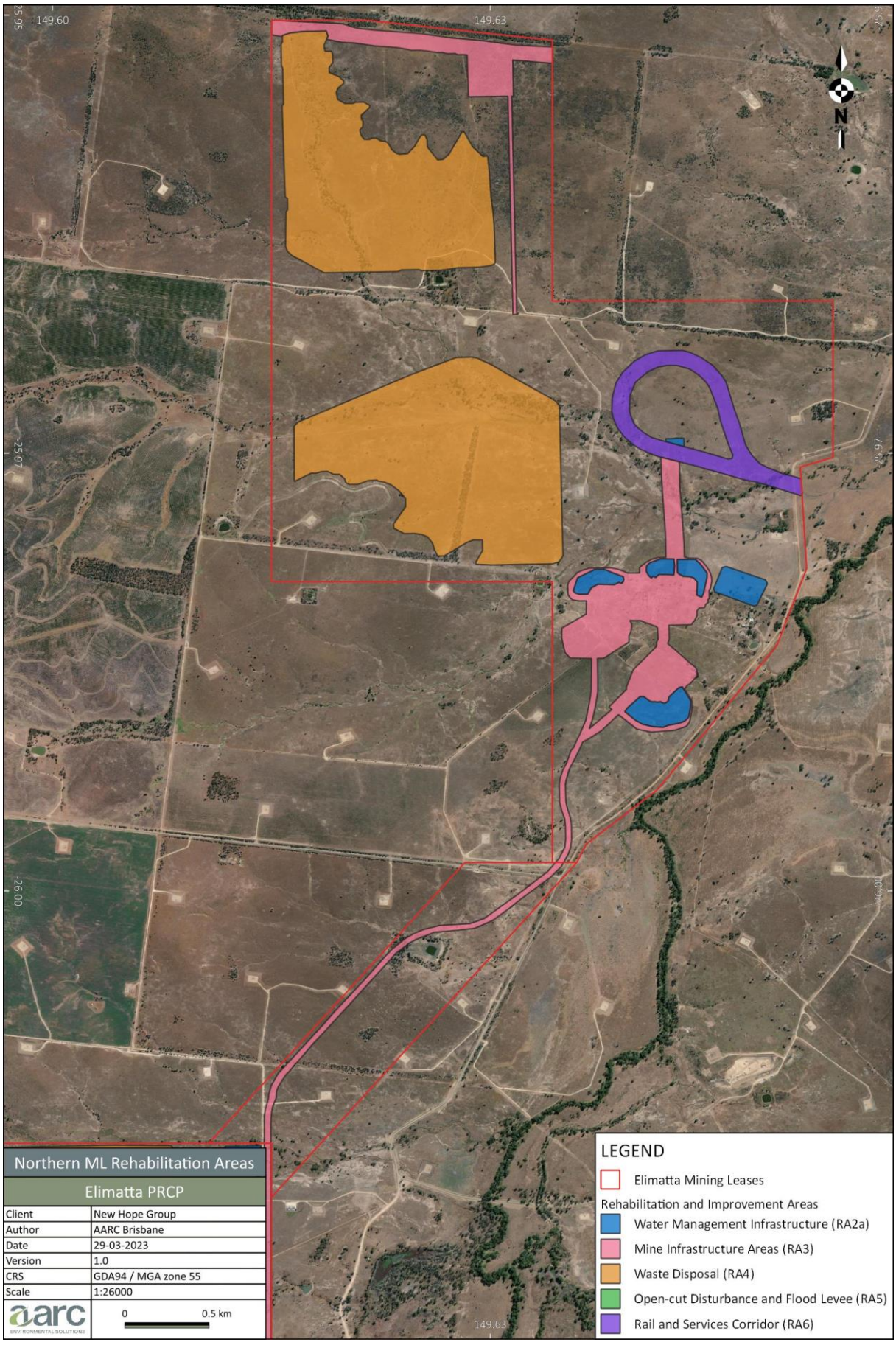

Figure 2: North MLs rehabilitation areas

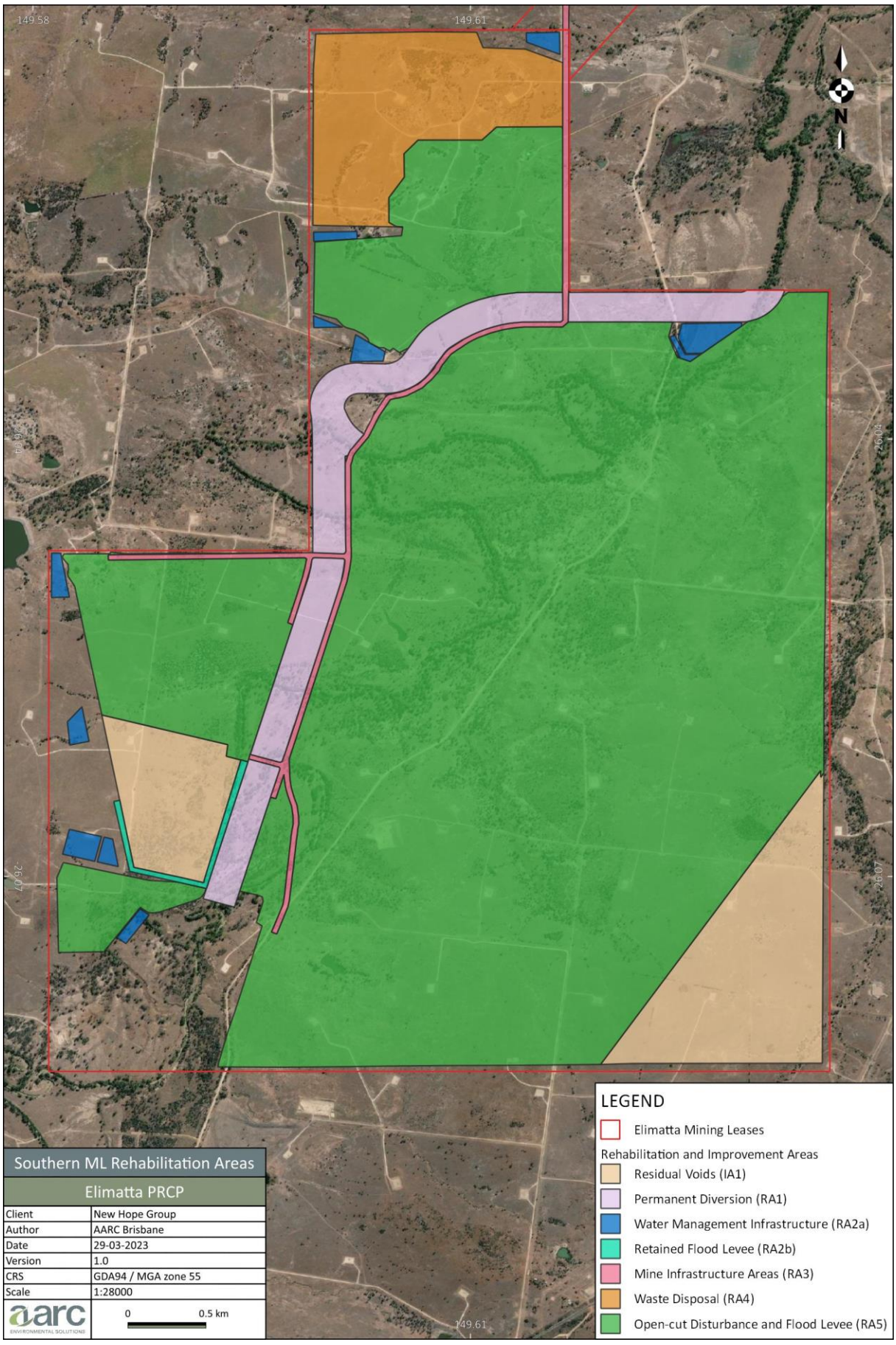

Figure 3: South ML rehabilitation areas

2 Rehabilitation requirements

In accordance with the Project's EA, NHG is required to undertake progressive rehabilitation of land disturbed by mining activities. These rehabilitation areas must be monitored at an appropriate frequency to demonstrate that site specific rehabilitation goals are likely to be achieved upon completion of the Project.

2.1 Environmental authority requirements

This RMP is intended to satisfy requirements prescribed in relevant conditions of the Project's EA which are:

C3 Tailings Disposal

Tailings must be managed in accordance with procedures contained within the current plan of operations. These procedures must include provisions for:

a) containment of tailings;

b) the management of seepage and leachates both during operation and the foreseeable future;

c) the control of fugitive emissions to air;

d) a program of progressive sampling and characterisation to identify acid producing potential and metal concentrations of tailings;

e) maintaining records of the relative locations of any other waste stored within the tailings;

f) rehabilitation strategy; and

g) monitoring of rehabilitation, research and/or trials to verify the requirements and methods for decommissioning and final rehabilitation of tailings, including the prevention and management of acid mine drainage, erosion minimisation and establishment of vegetation cover.

H1 Rehabilitation Landform Criteria

All areas significantly disturbed by mining activities must be rehabilitated to achieve the following rehabilitation goals:

a) safe to humans;

b) stable;

c) non-polluting; and

d) self-sustaining for the post-mining land use.

H2 Rehabilitation must commence progressively in accordance with the plan of operations

H3 A Rehabilitation Plan must be developed and implemented by a suitably qualified person and must include:

a) rehabilitation objectives to achieve the rehabilitation goals for all disturbed areas;

b) detailed rehabilitation methods for each disturbed area;

c) rehabilitation indicators to measure the success of the rehabilitation against the rehabilitation objectives;

d) final completion criteria that will achieve the rehabilitation goals and objectives; and

e) details of appropriate monitoring and maintenance of rehabilitation.

H5 All areas significantly disturbed by mining activities must be rehabilitated in accordance with the Rehabilitation Plan to achieve the final completion criteria.

H6 Residual Void Outcome

Residual voids must not cause any serious environmental harm to land, surface waters or any recognised groundwater aquifer, other than the environmental harm constituted by the existence of the residual void itself and subject to any other condition within this environmental authority.

H9 A Mine Closure and Rehabilitation Plan must be developed and implemented by a suitably qualified and experienced person for the mining lease areas that this environmental authority applies to, within twelve (12) months of the commencement of open cut coal mining activities (not including exploration activities).

2.2 Final land use and rehabilitation

The final land uses prescribed for each rehabilitation area will determine the rehabilitation goals, objectives, and performance indicators relevant to the Project. The post mine land descriptions, classifications and rehabilitation schedule for each area of and are included within the Project's PRCP.

The dominant current land use within the ML areas is low to medium intensity cattle grazing on native and improved pastures, along with the less common dryland forage cropping. Other land uses common in the region surrounding the Project area include dryland cereal cropping.

The current land use within the rail and services corridor is predominantly grazing. Approximately 40% of the corridor length has been cropped several times in the last 15 years, however, there are no areas where cropping has occurred every year.

The Queensland Land Use Mapping (ALUM) provides classifications for the various land uses that occur within the Project area (ABARES 2016), and are presented in Table 2.

Table 2: Australian land use and management classification (ABARES 2016)

Current land use	ALUM classification	Description
Cattle grazing on native pastures	Grazing native vegetation	Land uses based on grazing by domestic stock on native vegetation where there has been limited or no deliberate attempt at pasture modification.
Cattle grazing on improved pastures	Grazing modified pastures	Pasture and forage production, both annual and perennial, based on significant active modification or replacement of the initial vegetation.
Dryland forage cropping	Cropping	Land that is under cropping and in a rotation system such that different areas will be cropped while others are left available. These are classified by the primary use (i.e. pasture).
Dryland cereal cropping		

To determine the suitability of land within the Project MLs to support relevant land uses (i.e. beef cattle grazing, rainfed broadacre cropping and conservation uses) prior to and following mining activities, project disturbances were subject to a pre-mining land suitability assessment. Beef cattle grazing was assigned a land suitability Class of 3 - 4.

2.3 Rehabilitation goals, objectives, indicators and criteria

In Queensland, mine rehabilitation is required under the *Environmental Protection Act 1997* (EP Act). Amendments to the EP Act in late 2018 implemented key elements of the State Government's Mined Land Rehabilitation Policy (Queensland Government 2018) which intends to ensure that, for land disturbed by mining activities:

- the land is safe and structurally stable;
- there is no environmental harm being caused by anything on or in the land; and
- the land can sustain a post-mining land use (section 111A of the EP Act).

Site specific rehabilitation objectives, indicators and criteria have been developed for the Project to assist in achieving these goals for each rehabilitation area, as outlined in the PRCP.

Rehabilitation indicators provide measures of progress towards rehabilitation objectives. Completion criteria are the standards which provide a clear definition of successful rehabilitation. Completion criteria take the form of a set of measurable benchmarks against which the rehabilitation indicators can be compared to determine if objectives are being met. Rehabilitation is deemed successful when completion criteria for each rehabilitation goal and objective are consistently met.

The revegetation and landform completion criteria for disturbed and constructed landforms to meet post-mine land use prior to relinquishment are described in Table 3.

Table 3: Rehabilitation completion criteria

Rehabilitation milestone	Milestone criteria	Description	Management / monitoring measure(s)
RM1: Infrastructure decommissioning and removal	• All non-required services disconnected and removed • All concrete, bitumen and gravel roads removed (where not to be retained) • All non-required operational pipelines drained and removed • All fencing that is not part of PMLU requirements removed • All non-required buildings and footings demolished and/or removed off-site • All machinery and equipment removed • All surface water drainage infrastructure that is not retained in the final landform removed • All rubbish removed	Applicable to all infrastructure identified to be decommissioned/removed from site. Considered to be met when the area can be transitioned to the next milestone.	A visual inspection(s) will be conducted to determine that no infrastructure remains that does not form part of a Landholder Agreement.
RM2: Management of contaminated land status	• Contaminated material either remediated *in situ* or removed/transported to an approved landfill for disposal and waste tracking information recorded and submitted • Contaminated land assessment undertaken by an appropriately qualified person[1]. If required, a site investigation report including a site suitability statement prepared and submitted in accordance with the provisions of Chapter 7, Part 8 of the EP Act	Applicable to the waste rock dump area, mine infrastructure areas, and the tailings dam area (i.e. where notifiable activities have been carried out) and, at a minimum, involves the completion of a Phase 1 contaminated land investigation undertaken by an appropriately qualified person. Considered to be met when contaminated material has been placed removed from site, or remediated in situ, a validation report has been completed, and, if required, a site suitability statement has been prepared. Where required, remediation activities will be undertaken and recorded, and notifications completed.	A completed Phase 1 contaminated land investigation report, as well as any consequent reports where required. Visual inspection of potential sites or sources of contaminated material will be conducted, and samples collected as required. The contaminated land investigation will determine the presence of any contaminants. Remediation activities will be undertaken if required following consultation on appropriate remediation activities. A validation report will detail the remediation of contaminated land and, if required, a site suitability statement prepared by an appropriately qualified person that states that the land is suitable for

Rehabilitation milestone	Milestone criteria	Description	Management / monitoring measure(s)
			use according to the nominated PMLU.
RM3: Landform development (re-profiling / re shaping) of land affected by disturbance	• All earthworks and landform reshaping /re-profiling works completed to design specifications • Geotechnical assessment by an appropriately qualified person[1] confirms that long-term geotechnical stability has been achieved • Certification provided by an appropriately qualified person[1] confirms that drainage features are constructed to design specifications Landform constructed to the following design parameters, where relevant: • Waste rock emplacement: o slopes ≤10° (17%) o uninterrupted batter length ≤70 m o stable berms or bunds (≥5 m wide) • Flood levee slopes ≤10° (17%) • Diversions: o average grade of 0.00158 m/m o valley length of 7.25 km and stream length of 8.25 km o stream sinuosity of approximately 1.12	Applicable to all areas where bulk earthworks and other grading are required to achieve target landform shape and drainage characteristics. Considered to be met when graded banks are installed on WRDs, final landform water storages are cleared and natural drainage is established and all other applicable disturbance areas have been reprofiled to suit the surrounding landform. Additionally, a geotechnical assessment will be conducted to confirm that long-term geotechnical stability has been achieved.	Land based and/or remote sensing survey techniques will be employed to confirm that graded slopes meet design specifications. Additionally, visual inspections will be done to determine if any future maintenance/repair action is required. A geotechnical assessment will be conducted by an appropriately qualified person to confirm that long-term stability has been achieved for all relevant landforms.
RM4: Capping	• All earthworks and landform reshaping /re-profiling works completed to design specifications • Certification provided by an appropriately qualified person[1] confirms that drainage features are constructed to design specifications • Groundwater monitoring program confirms no migration of contaminants • Geotechnical assessment by an appropriately qualified person[1] confirms that long-term geotechnical stability has been achieved • Landform constructed to design parameters including:	Applicable to all TSFs and required to achieve target landform shape and drainage characteristics.	Survey of completed areas.

Rehabilitation milestone	Milestone criteria	Description	Management / monitoring measure(s)
	○ containment wall limited to 16 m in height ○ outer slope angles in the order of 1(V) in 3(H) (18°) ○ cover placement over the tailings (2 m) ○ placement of non-sodic cover materials (50 mm) ○ topsoil (300 mm)		
RM5: Surface preparation (topdressing, contour ripping, soil amelioration)	• Prior to each rehabilitation event, soil health and suitability are assessed and documented by an appropriately qualified person[1], and a recommendation made for ameliorants to ensure sodicity, salinity, pH and fertility levels are suitable to achieve the relevant PMLU • Records of ameliorants applied and incorporated into surface, as recommended by an appropriately qualified person[1] • Records of topsoil origin and placement of a target depth of 300 mm • Ripping undertaken along the contour of slopes	Applicable to all areas requiring revegetation. Includes final profiling and application of topsoil materials, soil testing, and soil amelioration. Considered to be met when surface preparation activities have been completed and soil condition is conducive to plant germination and growth.	A soil assessment will be conducted by an appropriately qualified person prior to each rehabilitation event to determine soil suitability, and recommendations made for ameliorants where required. Records of topsoil placement indicating achievement of a target depth of the ≥ 0.1 m. Records to include any ameliorants applied, including types, rates and timing of applications. Visual inspections and documentation of contour ripping, including depth, spacing and machinery used.
RM6: Grazing revegetation (seeding and / or planting)	• Records demonstrate seeding of target species and/or planting of tube stock (where relevant).	Applicable to all areas requiring revegetation. Includes seeding and/or planting of target revegetation species. Considered to be met when records demonstrate that seeding and/or planting of target species has been completed, with the understanding that remedial works such as reseeding or infill planting may be necessary to meet target vegetation completion criteria.	Survey of completed areas, and record of revegetation method retained. Records of seeded and/or planted species.

Rehabilitation milestone	Milestone criteria	Description	Management / monitoring measure(s)
RM7: Riparian habitat (native vegetation) revegetation (seeding and / or planting)	• Records demonstrate seeding of target species and/or planting of tube stock (where relevant).	Applicable to all areas requiring revegetation. Includes seeding and/or planting of target revegetation species. Considered to be met when records demonstrate that seeding and/or planting of target species has been completed, with the understanding that remedial works such as reseeding or infill planting may be necessary to meet target vegetation completion criteria.	Survey of completed areas, and record of revegetation method retained. Records of seeded and/or planted species.
RM8: Achievement of grazing PMLU to stable condition	• No prohibited invasive or restricted invasive plants, and weed cover is ≤5% (excluding exotic pasture grasses). Weed abundance is no greater than at representative analogue sites • Target percentage vegetation ground foliage cover of ≥50th percentile of that of representative analogue sites with similar landform parameters • Land capability assessment undertaken by an appropriately qualified person[1] confirms that land has achieved a minimum class 4 • Erosion classification[3] is comparable with erosion classifications[3] from nearby equivalent land uses with similar landform parameters, determined using analogue sites established in accordance with section **Error! Reference s ource not found.** (Monitoring and Maintenance) • No active erosion present as demonstrated by no increase in erosion ratings over time • Hazard and safety assessment completed by an appropriately qualified person[1] demonstrates hazards are consistent with the type and severity of hazards typical of the adjacent equivalent land use	Final milestone applicable to all rehabilitated areas (excluding RA7). Involves monitoring and remediation works if monitoring identifies risks to the final rehabilitation criteria being achieved. Considered to be met when all completion criteria have been achieved and land is safe, stable, does not cause environmental harm and can sustain the nominated PMLU.	A Hazard and Safety Assessment will be undertaken by an appropriately qualified person. Recommendations for remedial works will be made where required, and remedial activities undertaken as soon as practicable.
RM9: Achievement of native vegetation PMLU to stable condition	• Downstream water quality complies with water quality objectives or upstream / reference data • No erosion classified[3] as 'severe' nor 'extreme' gully erosion or washout features	Final milestone applicable to RA7. Involves monitoring and remediation works if monitoring identifies risks to the final rehabilitation criteria being achieved.	A Hazard and Safety Assessment will be undertaken by an appropriately qualified person.

Rehabilitation milestone	Milestone criteria	Description	Management / monitoring measure(s)
	• No active erosion present as demonstrated by no increase in erosion ratings over time • Assessed as geotechnically stable by an appropriately qualified person[1] • No prohibited invasive or restricted invasive plants, and weed cover is ≤5% (excluding exotic pasture grasses). Weed abundance is no greater than at representative analogue sites • Hazard and safety assessment completed by an appropriately qualified person[1] demonstrates hazards are consistent with the type and severity of hazards typical of the adjacent equivalent land use	Considered to be met when all completion criteria have been achieved and land is safe, stable, does not cause environmental harm and can sustain the nominated PMLU.	Recommendations for remedial works will be made where required, and remedial activities undertaken as soon as practicable.
RM10: Achievement of target pasture productivity criteria for grazing PMLU	• Pasture productivity is consistently[2] similar to or exceeding analogue sites • Vegetation structure and condition is consistent[2] with analogue sites	Rehabilitated areas to be assessed against all completion criteria developed with reference to analogue sites of similar characteristics and land use. Considered to be met when land can be transitioned to progressive certification.	Field surveys, drone and satellite data analysis as part of the annual rehabilitation monitoring.
RM11: Achievement of native vegetation PMLU to a sustainable condition	• Evidence of native fauna utilisation in the form of tracks, scats, and opportunistic observations • Land capability assessment undertaken by an appropriately qualified person[1] confirms that land has achieved a minimum class 4 • Evidence of flora recruitment from rehabilitation monitoring data • Vegetation structure and condition is consistently[2] similar to or exceeding analogue sites • Field-based monitoring data provided in the final rehabilitation report demonstrates that the following attributes are comparable or greater than representative analogue sites: o species richness of tree, shrub and groundcover functional groups; o tree canopy cover; o shrub canopy cover; and	Rehabilitated areas to be assessed against all completion criteria developed with reference to analogue sites of similar characteristics and land use. Considered to be met when land can be transitioned to progressive certification.	Field surveys, drone and satellite data analysis as part of the annual rehabilitation monitoring.

Rehabilitation milestone	Milestone criteria	Description	Management / monitoring measure(s)
	o perennial grass cover.		
RM12: Achievement of retained infrastructure PMLU to stable condition	• Hazard and Safety Assessment completed by an appropriately qualified person[1] demonstrates hazards in RAs are consistent with the type and severity of hazards typical of neighbouring equivalent land use. Remaining hazards are considered to be low risk with no significant increase in risk expected over time • Final landform survey confirms no built structures remain other than those that form part of a landholder agreement • No erosion classified[3] as 'severe' nor 'extreme' gully erosion or washout features • No active erosion present as demonstrated by no increase in erosion ratings over time	Final milestone applicable to all areas nominated as retained infrastructure. Involves monitoring and remediation works if monitoring identifies risks to the final rehabilitation criteria being achieved. Considered to be met when all completion criteria have been achieved and land is safe, stable, does not cause environmental harm and can sustain the nominated PMLU.	A Hazard and Safety Assessment will be undertaken by an appropriately qualified person, and a final landform survey will be undertaken to confirm that retained infrastructure forms part of a landholder agreement. Recommendations for remedial works will be made where required, and remedial activities undertaken as soon as practicable.

1. Appropriately qualified person means a person who has professional qualifications, training, skills or experience relevant to the nominated subject matter and can give authoritative assessment, advice and analysis on performance relating to the subject matter using the relevant protocols, standards, methods, or literature.
2. Consistently means that the criterion is met for a minimum of three consecutive years.
3. Erosion classification framework see Table 5 in Section 3.3.2.

3 Monitoring program design and methodology

3.1 Monitoring program design

The RMP has been designed to assess rehabilitation progress to effect acceptance of rehabilitation by the administering authority and to support surrender of the MLs. A key assessment will be the behaviour of rehabilitated areas in comparison with surrounding non-mind lands, or analogue sites.

3.1.1 Rehabilitation monitoring frequency and coverage

Rehabilitation will be monitored at a frequency appropriate to the stage that rehabilitation is at, generally with the survey period occurring post wet season, as monitoring at this time allows for more accurate identification of the species present and a clearer understanding of species richness on-site.

The rehabilitation monitoring program will be reviewed to ensure that data collection is achieved at sufficient spatial and temporal resolution to ensure statistically valid results.

3.2 Rehabilitation monitoring program

3.2.1 Analogue sites

Rehabilitation completion criteria, described for each mine domain, can be achieved by comparing a number of variables between rehabilitation areas and existing ecosystems (analogue sites) over time.

Pasture and native vegetation analogue or reference transects should provide sufficient replication to allow for statistical testing that is rigorous enough to determine differences between a reference site and rehabilitation values and demonstrate the achievement of completion criteria. It is recommended that a minimum of three transects be established within each representative reference modified pasture grazing area and each representative reference native vegetation grazing area. The frequency and timing of monitoring of reference sites is to coincide with monitoring of rehabilitation areas. Where possible, reference sites should be chosen that replicate the anticipated slopes of rehabilitated areas. Results from analogue sites will be used to compare and assess monitoring results obtained from rehabilitated site transects. Analogue sites will be recorded as GIS files, for replication.

Analogue sites relevant to the proposed Horse Creek Diversion and subsequent re-instatement of a riparian habitat have been established during baseline surveys. The location of these sites is detailed in Table 4. Analogue sites representative of the proposed post-mining land use of low intensity grazing on native and improved pastures will be established prior to the commencement of the Project.

Rehabilitation monitoring will aim to demonstrate that domain specific completion criteria have been continuously met for a period of three years before the rehabilitation is considered successful.

Table 4: Proposed riparian habitat rehabilitation monitoring locations

Site ID	Vegetation community	Location (GDA94, Zone 55)	
		Easting	Northing
BC4	RE 11.3.25	758373.38	7112341.98
BC5	RE 11.3.25	763343.76	7119132.51
BC6	RE 11.3.25	762791.84	7119181.31

3.2.2 Rehabilitation sites

Rehabilitation sites will be determined during progressive rehabilitation where land becomes available following mining disturbance. These areas will be compared to the predefined analogue sites.

3.3 Rehabilitation monitoring aspects

The following methods are employed at each monitoring site and described in detail in the following sections:

- permanent vegetation monitoring transects (ground cover monitoring and species richness);
- photographic monitoring;
- erosion monitoring;
- topsoil characterisation (every 2–3 years).

In conjunction with walking between transects, rehabilitation areas will be visually assessed to identify signs of fauna utilisation, noticeable issues such as erosion, vegetation cover deficiencies, or weed and / or pest infestations. Satellite imagery technology may also be employed. These observations are incorporated with the results of each rehabilitation progress report.

3.3.1 Vegetation monitoring

Vegetation monitoring will involve the collection of quantitative data for:

- ground cover percentage;
- canopy cover;
- species richness;
- woody stem density;
- recruitment; and
- weeds.

Each monitoring site is demarcated by a 50 m long transect and observations/ measurements are taken at each 5 m interval on either side of the transect, thereby representing an effective plot size of 50 m by 10 m. A plastic delineator post guide will be installed at each end of the transect to ensure the exact location of the permanent transect can be identified, ensuring robust sampling repetition.

The survey methodology outlined has been adapted based on information contained within the *BioCondition Assessment Framework* (Eyre et al. 2015), the *Vegetation Assessment Guide* (DoE 2013), and the *Methodology for Survey and Mapping of Regional Ecosystems and Vegetation Communities in Queensland* (Neldner et al. 2022).

3.3.1.1 Species richness

To measure species richness, all vascular plants occurring within 5 m of either side of the 50 m transect are recorded. Any species unable to be identified are collected for later identification. Species will be classified into one of the following six groups for reporting purposes:

- native pasture species;
- exotic pasture species;
- trees;
- shrubs;

- forbs; and
- noxious weeds.

This methodology is used to record species richness and the projective foliage cover on the transects to assess against milestone criteria. It should be noted that due to the pastoral nature of rehabilitation sites, the projective foliage cover is inferred from the vegetation cover measured at each transect.

3.3.1.2 Ground cover

Ground cover monitoring involves the collection of quantitative data on average ground cover (percent) where the percentage of all types of ground cover within ten 1 m x 1 m quadrats is determined. Similar to the transect above, the quadrat shall be placed every 5 m on alternating sides of the transect, commencing at 0 m on the right and the final quadrat at 45 m. In each quadrat the total percentage ground foliage cover of each plant species and the percentage cover of bare soil, rock and organic litter is recorded.

Ground foliage cover incorporates native perennial grass cover, native annual grass cover, native forbs and other species, native shrubs (< 1m height), non-native grass, non-native forbs and shrubs, litter, rock, bare ground and cryptogams.

3.3.1.3 Recruitment

Recruitment is assessed using methodology adapted from Eyre *et al.* 2015 whereby recruitment is assessed over the 10 m x 50 m plot (5 m either side of each 50 m transect) (refer to Figure 4). Within this plot, the proportion of dominant species found to be regenerating are counted. A regenerating individual is identified as a woody stem species with a diameter at breast height of <5 cm. For each dominant canopy species present, at least one individual must be present as a sapling or seedling for the species to be considered as regenerating. The presence of all dominant species in the regenerative state would make up 100% recruitment.

3.3.1.4 Canopy cover

Tree canopy cover can be used to characterise stand productivity and the distribution and abundance of biomass (Eyre *et al*. 2017). It refers to the estimation of the percentage canopy cover of the living, native tree layer along a 50 m transect, using the line intercept method (Greig-Smith 1964). For this attribute, the vertical projection of tree canopy cover of the species making up the tree canopy cover is assessed. The vertical projection of the tree canopy over the 50 m transect is recorded as illustrated in Figure 4. The total length of the projected canopy of each layer is then divided by the total length of the tape to give an estimate of percentage canopy cover on the site.

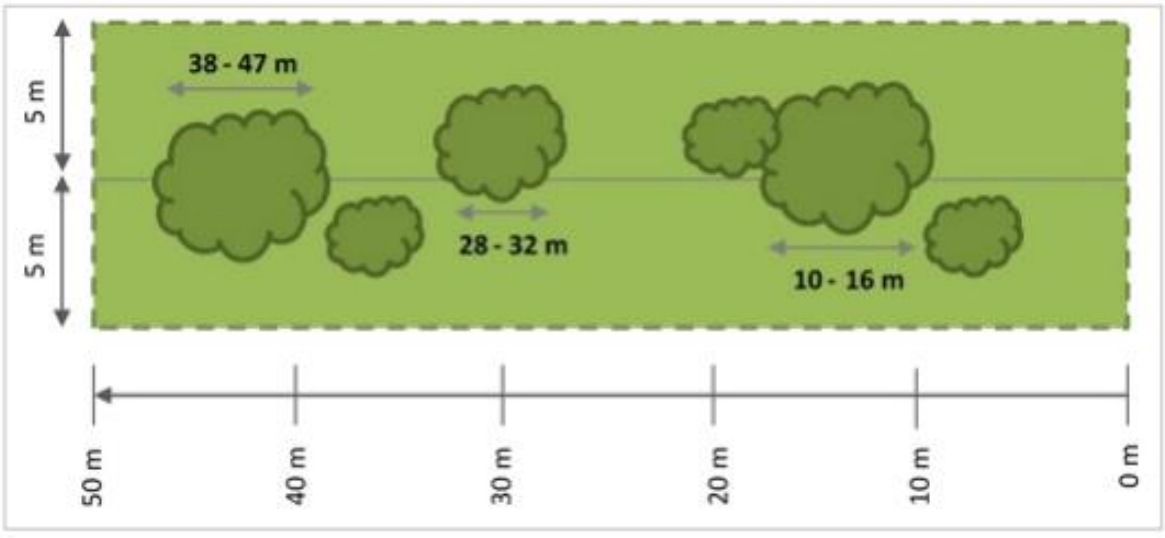

Figure 4: Guide to monitoring canopy cover (after Eyre et al. 2017)

3.3.1.5 Pasture productivity

An assessment of pasture productivity will be undertaken to determine the achievement of the target PMLU. Pasture productivity within rehabilitated areas will be assessed using either manual measurements or satellite imagery. Measurements for pasture productivity should be undertaken at the end of the growing season. Manual measurements of pasture productivity will be undertaken in accordance with relevant industry guidelines. Pasture mass and height are common proxy measurement used for assessing pasture productivity.

To measure pasture mass:

1) A 30 x 30 cm quadrat will be established to measure sample sites.
2) A digital photograph is to be taken of the sample quadrat.
3) Pasture is then cut to ground level and placed in a paper bag.
4) The paper bag is placed on a wet/dry balance and the mass is recorded.
5) The process is then repeated for a minimum of 15 sites across the paddock and up to 20 sites if the paddock has significant variability in cover.
6) Data collected is then used below to calculate the average pasture mass in kilograms of dry matter per hectare (kg DM/ha).

To measure pasture height using the ruler/stick method (Meat and Livestock Australia 2019):

1) A 1 cm thick dowel, 30 cm long is marked 0.5 cm from the bottom, then every 1cm along the stick. Note: readings between 0.5cm and 1.5cm will be recorded as 1cm, readings between 1.5cm and 2.5cm as 2cm etc.
2) To measure the pasture, place the stick vertically on the soil surface at the point where the base of the stick landed.
3) Slide a thumb down the stick until you touch a green leaf and record the cm.
4) Measure the height from at least 50 sites chosen at random as you traverse the paddock. The best way is to throw the stick as you walk across the paddock.
5) Pasture mass is then estimated in kg dry matter DM/ha using the approximate relationship between pasture height and a kg DM/ha chart.

Pending the outcomes of the advancement of the use of remote sensing / satellite imagery currently being undertaken, pasture productivity may be estimated from the use remote sensing or satellite imagery. For example, the CSIRO in partnership with the Western Australian Government has developed a '*Pastures from Space*' program which will utilise satellite imagery to provide real-time data on green pasture biomass and feed on offer. The use of satellite imagery is beneficial in providing a site-wide analysis and comparative analysis with analogue sites.

3.3.2 Erosion monitoring

An erosion monitoring methodology has been developed by experienced AARC ecologists with consideration to relevant guidelines and research (Neldner *et al.* 2019, Eyre *et al*. 2017 and DSITI 2015). Erosion monitoring is to be conducted across all analogue and rehabilitation monitoring locations. Rehabilitation areas will be inspected to assess the extent of erosion features and an erosion rating for each site will be determined. Erosion features or indicators may include wind or sheet erosion, erosion rills, gullies or tunnels, or signs of slumping.

Erosion at the survey sites is monitored through visual assessment over time. Assessment is undertaken by traversing the 50 m transects described in Section 3.3.1, and recording the number and average depth of any erosion features or rill lines. Table 5 is used to record and classify these observations. The overall classification

of the erosion on each transect is determined by the higher classification attributed to either the number of rills/gullies or the average depth. For example, a transect may present only one or two rills but if these are recorded as being 25 cm deep, the transect will be classified as presenting a Moderate erosion classification.

Obvious cases of localised settlement which are not causing any subsequent erosion are not counted as instances of erosion.

Table 5: Erosion classifications

Erosion classification	Minor	Moderate	Severe
Sheet erosion	Shallow soil deposits downslope	Partial exposure of roots; moderate soil deposits downslope, etc.	Loss of surface horizons; root exposure, etc.
Rill/gully erosion	<15 rills and <0.3 m deep	15 – 30 rills and <0.3 m deep	>30 rills and/or any >0.3 m deep
Tunnel erosion	-	-	Present
Mass movement	-	-	Present

It should be noted that the placement of the permanent transects may not be representative of the level of erosion across the entire rehabilitation area landforms. To compensate for this, general observations undertaken during the survey are also utilised in assessing rehabilitation performance. The location of any severe erosion outside the transect (i.e. tunnels, mass wasting, large gullies) is also recorded and marked with a handheld Global Positioning System (GPS).

The following information is recorded at each site:

- GPS reading of location;
- general description of type of erosion (gully [> 30 cm], rill line [<30 cm], circular failure, tunnelling etc.) and possible causes, refer to the glossary of terms for definitions of erosion types;
- depth of erosion;
- width of erosion;
- length of erosion;
- where eroded material is being deposited; and
- whether the erosion line is being stabilised by vegetation.

3.3.3 Soil monitoring

Topsoil sampling is not considered to be an annual requirement of the rehabilitation monitoring program, but it is recommended to be undertaken at the commencement of rehabilitation monitoring to identify and address any deficiencies in the chemical composition or exceedances in the metal composition of the soil that may be detrimental to vegetation health.

Soil monitoring involves the collection of topsoil samples from a maximum depth of 10 cm to obtain quantitative data on the chemical and physical properties of soil. Soil sampling methodology has been adapted from Monitoring and Sampling Manual Environmental Protection (Water) Policy 2009 (DES 2018). Soil sampling is conducted by collecting approximately 200 g samples with a clean non-metallic shovel and bucket every 10 m along the 50 m transect. The first sample is collected at 0 m. These five samples are mixed in the bucket. The final 200 g soil sample is taken from the mix and placed into plastic sample bag. Samples are sent to a National Association of Testing Authorities (NATA) certified laboratory for analysis of indicators of soil nutrition and land contamination including:

- pH;
- electrical conductivity;
- soluble chloride;
- moisture content;
- Emerson aggregate stability test;
- exchange acidity;
- exchangeable cations (calcium, magnesium, potassium, sodium and aluminium);
- cation exchange capacity;
- calcium : magnesium ratio (Ca: Mg);
- exchangeable sodium percentage (ESP);
- total nitrogen, nitrite and nitrate;
- sulphate;
- extractable potassium and phosphorous (Colwell);
- total organic carbon and organic matter; and
- trace elements (arsenic, boron, cadmium, chromium, cobalt, copper, iron, lead, manganese, nickel and zinc).

Soil moisture content shall be measured for interpretive purposes only and will not be assessed in determining rehabilitation performance.

Ideally, rehabilitation site data should reflect that of analogue sites, though data indicating a trajectory to meet performance criteria may be sufficient in supporting the chosen post-mining land use.

3.3.4 Photographic monitoring

Photographic monitoring provides a visual record of the vegetation, ground cover, erosion and general appearance of each analogue and rehabilitation site, allowing these sites to be compared over time (Eyre *et al.* 2015). A digital camera is used to take the photos so that a permanent record can be kept for each site. The process of taking the monitoring photos is as follows:

1) The person taking the photograph stands at the star picket which marks the beginning of the 50 m.
2) The camera is then aimed directly toward the end of the 50 m transect and a single photograph is taken.
3) The person then stands at the star picket which marks the end of the 50 m transect.
4) The camera is then aimed directly toward the start of the 50 m transect and a single photograph is taken.
5) Steps 1 – 6 are repeated for all terrestrial monitoring sites.
6) The digital photographs are then downloaded and stored for future reference.

3.3.5 Fauna observations

Observations of any fauna species or indicators of fauna presence (e.g., scats, tracks, or other signs of fauna activity) within or in the vicinity of the rehabilitation areas will be noted as part of rehabilitation monitoring.

3.3.6 Water quality monitoring

3.3.6.1 Surface water quality monitoring

The surface water quality monitoring component of the RMP will be undertaken as part of the Receiving Environment Monitoring Program for the Project. The surface water quality monitoring sites include on-site water storages, on-site surface water ponding and the receiving environment. Receiving environment monitoring will be undertaken at background (i.e., control) sites located upstream of any release points on Horse Creek. These sites are located outside the immediate zone of influence from release locations. Monitoring will also be undertaken at impact sites located downstream and within the potential zone of influence including downstream locations at Horse Creek and Nine Mile Creek.

3.3.6.2 Stream sediment monitoring

Sediment quality sampling is to be undertaken in accordance with the Queensland Monitoring and Sampling Manual 2018 (DES 2018). The stream sediment monitoring component of the RMP will be undertaken as part of the Projects Receiving Environment Monitoring Program.

3.3.6.3 Groundwater quality

The groundwater monitoring component of the RMP will be undertaken as part of the Groundwater Monitoring Program for the Project. Groundwater quality monitoring will be undertaken biannually and will be compared with reference groundwater data. Groundwater monitoring will be undertaken by a competent person and will be in accordance with the latest edition of the administering authorities water quality sampling manual.

4 Data analysis, interpretation and reporting

4.1 Laboratory analysis

All soil samples collected during rehabilitation monitoring will be sent to a NATA certified laboratory for analysis of the recommended parameters.

In the event that, any plants cannot be identified in the field, samples will be sent to the Queensland herbarium for identification.

4.2 Progress reporting

A rehabilitation report will be prepared following the collection of monitoring data to provide a detailed analysis of monitoring results and evaluate rehabilitation progress towards completion criteria. This ongoing evaluation will enable the early detection of unfavourable trends in measured indicators and identify any requirements for adaptive management practices to ensure rehabilitation success and certification in the long term.

4.2.1 Interpretation

Rehabilitation monitoring results will be analysed both categorically and temporally. Results obtained from rehabilitation sites will be compared to analogue sites from the same final land use vegetation community. Rehabilitation monitoring results will also be compared with historical data where possible to detect any trends over time. Common variables such as climatic conditions, seasonal variation and other event specific circumstances will also be considered in the analysis of rehabilitation data.

5 References

ABARES 2016, *The Australian Land Use and Management Classification Version 8*, Australian Bureau of Agricultural and Resource Economics and Sciences, Canberra.

DES 2018, *Monitoring and Sampling Manual Environmental Protection (Water) Policy 2009*, Version 2, July 2018, Department of Environment and Science, Queensland Government, Brisbane.

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DSITI 2015, Chapter 1: Introduction, in Soil conservation guidelines for Queensland, Department of Science, Information Technology and Innovation, Brisbane.

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Neldner, V, Wilson, B, Dillewaard, H, Ryan, T, Butler, D, McDonald, W, Addicott E, and Appelman, C 2019, Methodology for Survey and Mapping of Regional Ecosystems and Vegetation Communities in Queensland, Version 4.0, updated March 2019, Queensland Herbarium, Department of Environment and Science, Brisbane.

Appendix G. Provided technical studies

AARC AustralAsian Resource Consultants (AARC) 2013, Elimatta Project - Soil and Land Suitability Assessment, Prepared for Taroom Coal Pty Ltd.

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Appendix H. Rehabilitation Risk Assessment

Ref.				Risk Description					Risk Evaluation						Risk Rating			
Risk Type (T=Threat	Category	Subcategory	Item	Risk Scenario/Threat Title	Causes (Triggers / Indicators)	Impacts (Consequences)	Existing Controls	Control Effectiveness	Likelihood - Frequency	Likelihood - Probability	Health	Safety	Environment	Compliance	Health	Safety	Environment	Compliance
T	**A**			**In-pit and out-of-pit spoil dumps**														
T	**A**	**01**		**Safe**														
T	A	01	01	Surface roughness (rockiness, depressions) in excess of that expected for the PMLU	Erosion gullies etc due to subsoil/ topsoil characteristics/availability, inadequate surface preparation, poor early germination, localised settlement, rock used for erosion control	Safety hazard for personnel, stock and wildlife	Surface preparation measures (initial), monitoring, maintenance controls (pre-closure), risk assess controls when designed and placed and modify as required, post-closure monitoring.		P			Mi				M		
T	A	01	02	Slope steepness in excess of that expected for the PMLU	Inappropriate landform design, landform design restrictions	Safety hazard for personnel, stock and wildlife	Landform design criteria appropriate to PMLU, operational slope controls		U			Mo				M		
T	**A**	**02**		**Stable - geotechnical risk**														
T	A	02	01	Significant slope failure	Excessive slope steepness, physical material properties, poor drainage, adverse rainfall event	Localised land impacts and downstream water quality impacts	Geotechnical analysis undertaken where appropriate, slope moderation, provision of adequate drainage infrastructure, rapid revegetation		U				Mo				M	
T	**A**	**03**		**Stable - erosional risk**														
T	A	03	01	Initial/ongoing gully, pipe and/or sheet erosion of rehabilitated areas	Erodible topsoils and subsoils, adverse weather events	Localised land impacts and downstream water quality impacts	Soil sampling and analysis prior to rehabilitation. Landform design moderating slope, adequate/effective subsoil and topsoil amelioration, prompt revegetation establishment, revegetation monitoring and management as required, sediment controls during establishment.		P				Mi				M	
T	A	03	02	Initial/ongoing gully, pipe and/or sheet erosion of rehabilitated areas	Inadequate rehabilitation drainage capacity and/or design	Localised land impacts and downstream water quality impacts	Drainage network design with acceptable design standards for drainage structures, avoidance of flow concentration, sub-catchment delineation, sufficient water storage structures, engineered flow channels, effective revegetation techniques, rehabilitation monitoring and management as required		U				Mi				M	
T	A	03	03	Initial/ongoing gully, pipe and/or sheet erosion of rehabilitated areas	Adverse climatic events and/or climatic sequences beyond design capacity	Localised land impacts and downstream water quality impacts	Rehabilitation of disturbance area, downstream sedimentation controls, revegetation, monitoring and maintenance		U				Mi				M	
T	A	03	04	Initial/ongoing gully, pipe and/or sheet erosion of rehabilitated areas (medium-long term risk)	Rehabilitation failure/ vegetation disease/loss, climatic events, other	Localised land impacts and downstream water quality impacts	Landform design moderating slope, adequate/effective subsoil and topsoil amelioration, prompt revegetation establishment, revegetation monitoring and management as required		P				Mo				**H**	
T	**A**	**04**		**Non-polluting - geochemical risk**														
T	A	04	01	Acid and saline drainage generation	Adverse waste rock geochemistry, external to site	Revegetation performance impacts, downstream receiving environment water quality and dependent ecosystem impacts	NAPP waste rock materials, low propensity for saline drainage generation, water quality monitoring and assessment		U				Hi				M	
T	A	04	02	Acid and saline drainage generation - impacts to groundwater	Adverse waste rock geochemistry, external to site	Groundwater impacts (incl. GDEs)	NAPP waste rock materials, low propensity for saline drainage generation, water quality monitoring and assessment		U				Hi				M	

Ref.				Risk Description				Control Effectiveness	Risk Evaluation						Risk Rating			
Risk Type (T=Threat	Category	Subcategory	Item	Risk Scenario/Threat Title	Causes (Triggers / Indicators)	Impacts (Consequences)	Existing Controls		Likelihood - Frec	Likelihood - Prol	Health	Safety	Environment	Compliance	Health	Safety	Environment	Compliance
T	**A**	**05**		**Non-polluting - other environmental harm**														
T	A	05	01	TSS in site drainage in excess of that expected for the PMLU	Dispersive materials used in construction of WRDs	Downstream water quality impacts	Soil testing and amelioration and prompt vegetation establishment, revegetation monitoring and management		P				Hi				**H**	
T	**A**	**06**		**Sustainable - PMLU**														
T	A	06	01	Insufficient pasture productivity/diversity/density for the PMLU	Weather, poor soil characteristics, poor management practices impacting germination, vegetation establishment and PMLU density/diversity metrics	Insufficient pasture productivity	Ongoing grazing management, soil amelioration, pasture performance monitoring, revegetation timing		P				Mo				**H**	
T	A	06	02	Insufficient topsoil resources onsite available to undertake rehabilitation activities	Poor management practices, shortage of topsoil resources	Poor vegetation establishment, insufficient habitat suitable for native fauna, insufficient pasture productivity	Adequate topsoil stockpiling and management strategies		U				Mo	Mi			M	M
T	A	06	03	Pests and weeds	Poor local, regional or site property management practices, weed invasion	Increased risk of not achieving designated PMLU	Pest and weed management practices, monitoring programs to allow early detection and management		U				Mo				M	
T	**B**			**Waste Disposal (including capped surface TSFs)**														
T	**B**	**01**		**Safe**														
T	B	01	02	Surface roughness (rockiness, depressions) in excess of that expected for the PMLU	Challenging subsoils/ topsoils, inadequate surface preparation, localised settlement, erosion gullies	Safety hazard for personnel and wildlife	Surface preparation measures (initial), monitoring, maintenance controls (pre-closure)		P			Mi				M		
T	**B**	**02**		**Stable - geotechnical risk**														
T	B	02	01	Significant slope failure	Excessive slope steepness, not constructed to design, adverse rainfall event	Localised land impacts and downstream water quality impacts	Engineered design and inspection, geotechnical assessment, certification that final landform is safe and stable		U				Hi				M	
T	**B**	**03**		**Stable - erosional risk**														
T	B	03	01	Initial/ongoing gully, pipe and/or sheet erosion of rehabilitated areas	Erodible topsoils and subsoils, adverse weather events	Localised land impacts and downstream water quality impacts, sedimentation Creek lines	Soil samping and analysis prior to rehabilitation. Adequate/effective subsoil and topsoil amelioration, prompt revegetation establishment, revegetation monitoring and management as required		U				Mi				M	
T	B	03	02	Initial/ongoing gully, pipe and/or sheet erosion of rehabilitated areas	Inadequate rehabilitation drainage capacity and/or design	Localised land impacts and downstream water quality impacts, sedimentation Creek lines	Cell design incorporates engineered spillways, avoidance of flow concentration by batter surface preparation, effective revegetation techniques, rehabilitation monitoring and management as required		U				Mi				M	
T	B	03	03	Initial/ongoing gully, pipe and/or sheet erosion of rehabilitated areas	Adverse climatic events and/or climatic sequences beyond design capacity	Localised land impacts and downstream water quality impacts, sedimentation Creek lines	Downstream sedimentation controls, revegetation, monitoring and maintenance		U				Mi				M	
T	B	03	04	Initial/ongoing gully, pipe and/or sheet erosion of rehabilitated areas (medium-long term risk)	Rehabilitation failure/ revegetation disease, climatic events, other	Localised land impacts and downstream water quality impacts, sedimentation Creek lines	Adequate/effective subsoil and topsoil amelioration, prompt revegetation establishment, revegetation monitoring and management as required		P				Mo				**H**	

Ref.				Risk Description				Control Effectiveness	Risk Evaluation						Risk Rating			
Risk Type (T=Threat	Category	Subcategory	Item	Risk Scenario/Threat Title	Causes (Triggers / Indicators)	Impacts (Consequences)	Existing Controls		Likelihood - Freq	Likelihood - Prob	Health	Safety	Environment	Compliance	Health	Safety	Environment	Compliance
T	**B**	**04**		**Non-polluting - geochemical risk**														
T	B	04	01	Acid Mine drainage	Adverse waste rock geochemistry, construction not according to design, inadequate capping	Revegetation performance impacts, downstream receiving environment water quality and dependent ecosystem impacts	Routine confirmatory geochemical testing, progressive rehabilitation, surface water/groundwater monitoring programme		U				Hi				M	
T	B	04	02	Acid Mine drainage and seepage	Design failure	Groundwater quality impact	Progressive rehabilitation, surface water/groundwater monitoring programme, groundwater studies, monitoring piezometers		U				Hi				M	
T	**B**	**05**		**Non-polluting - other environmental harm**														
T	B	05	01	Not applicable														
T	**B**	**06**		**Sustainable - PMLU**														
T	B	06	01	Insufficient pasture productivity/diversity/density for the PMLU	Weather, poor soil characteristics, poor management practices impacting germination, vegetation establishment and PMLU density/diversity metrics	Failure to achieve rehabilitation completion criteria targets	Ongoing grazing management, soil amelioration, pasture performance monitoing, revegetation timing		P				Mo				**H**	
T	B	06	02	Pests and weeds	Poor local, regional or site property management practices, weed invasion	Increased risk of not achieving designated PMLU	Pest and weed management practices, monitoring programs to allow early detection and management, intensify monitoring and management measures as appropriate.		U				Mo				M	
T	B	06	03	Insufficient quality topsoil resources onsite available to undertake rehabilitation activities	Poor management practices, shortage of topsoil resources	Increased risk of not achieving PMLU	Implementation of topsoil management plan, annual review of topsoil inventory.		U				Mo	Mi			M	M
T	**C**			**Rehabilitated water management structures**														
T	**C**	**01**		**Safe**														
T	C	01	01	Surface roughness (rockiness, depressions) in excess of that expected for the PMLU	Erosion gullies etc due to subsoil/ topsoil characteristics/availability, inadequate surface preparation, poor early germination, localised settlement, rock used for erosion control	Safety hazard for personnel, stock and wildlife	Surface preparation measures (initial), monitoring, maintenance controls (pre-closure), risk assess controls when designed and placed and modify as required, post-closure monitoring.		U				Mi			M		
T	**C**	**02**		**Stable - geotechnical risk**														
T	C	02	01	Not applicable														
T	**C**	**03**		**Stable - erosional risk**														
T	C	03	01	Initial/ongoing gully, pipe and/or sheet erosion of rehabilitated areas	Erodible topsoils and subsoils, adverse weather events	Localised land impacts	Soil sampling and analysis prior to rehabilitation. Adequate/effective subsoil and topsoil amelioration, prompt revegetation establishment, revegetation monitoring and management as required.		U				Mi				M	
T	C	03	02	Initial/ongoing gully, pipe and/or sheet erosion of rehabilitated areas	Inadequate rehabilitation drainage capacity and/or design	Localised land impacts and downstream water quality impacts	Downstream sedimentation controls, revegetation, rehabilitation and water quality monitoring, maintenance and repair activities as required.		U				Mi				M	
T	C	03	03	Initial/ongoing gully, pipe and/or sheet erosion of rehabilitated areas	Adverse climatic events	Localised land impacts and downstream water quality impacts	Downstream sedimentation controls, revegetation, rehabilitation and water quality monitoring, maintenance and repair activities as required.		U				Mi				M	
T	C	03	04	Initial/ongoing gully, pipe and/or sheet erosion of rehabilitated areas (medium-long term risk)	Rehabilitation failure/ revegetation disease, climatic events	Localised land impacts and downstream water quality impacts	Landform design similar contour to surrounding environment, adequate/effective subsoil and topsoil amelioration, prompt revegetation establishment, revegetation monitoring and management as required.		U				Mi				M	

Ref.				Risk Description				Control Effectiveness	Risk Evaluation						Risk Rating			
Risk Type (T=Threat	Category	Subcategory	Item	Risk Scenario/Threat Title	Causes (Triggers / Indicators)	Impacts (Consequences)	Existing Controls		Likelihood - Frec	Likelihood - Prol	Health	Safety	Environment	Compliance	Health	Safety	Environment	Compliance
T	**C**	**04**		**Non-polluting - geochemical risk**														
T	C	04	01	Not applicable														
T	**C**	**05**		**Non-polluting - other environmental harm**														
T	C	05	01	Contaminated land (applicable to environmental and sediment dams)	Inadequate assessment and remediation prior to rehabilitation	Land contamination, surface water impacts, poor vegetation establishment	Contamintated land assessment, water quality monitoring, records of remediation activities		U				Mo				M	
T	**C**	**06**		**Sustainable - PMLU**														
T	C	06	01	Insufficient pasture productivity/density/diversity of vegetation in PMLU	Adverse weather, poor soil characteristics and slopes impacting germination, vegetation establishment and PMLU density/diversity metrics	Reduced pasture production due to unsuitable conditions	Topsoil amelioration, improving rehabilitation methodologies, seeding rates to be finalised with local agronomists prior to seeding, sowing of seeds not to be undertaken in adverse weather conditions management and maintenance activities, rehabilitation performance monitoring and assessment, undertake repairs and improvement works as required.		U				Mo				M	
T	C	06	02	Pests and weeds	Poor local, regional or site property management practices.	Increased risk of not achieving PMLU	Pest and weed management practices, monitoring programs to allow early detection and management, intensify monitoring and management measures as appropriate.		U				Mo				M	
T	C	06	03	Insufficient quality topsoil resources onsite available to undertake rehabilitation activities	Poor management practices, shortage of topsoil resources	Increased risk of not achieving PMLU	Adequate topsoil stockpiling and management strategies		U				Mo	Mi			M	M
T	**D**			**Residual voids**														
T	**D**	**01**		**Safe**														
T	D	01	01	Void overtopping	Extreme rainfall events beyond design capacity, insufficient water level monitoring	Increased hazard to humans and animals	Void water level monitoring, hydrological modelling, constructed to design criteria		R			Mo				L		
T	D	01	02	Cattle, humans or wildlife access to the residual void	Insufficient warnings, barriers preventing access to hazardous areas, fencing/bunding breaks, unauthorised access	Falls, slips, trips impacting humans, livestock and wildlife. Livestock accessing void water for drinking	Signage, physical barriers, slope moderation, conduct a risk assessment of controls when designed and placed. Modify as required. Post closure monitoring.		R			Hi				M		
T	**D**	**02**		**Stable - geotechnical risk**														
T	D	02	01	Final void highwalls and low walls subject to significant slope failure	Excessive slopes, inadequate design, not constructed to design, inadequate drainage controls, adverse weather event	Localised land impact	Slope moderation, final landform design, maximum slopes subject to engineered design, assessment of construction materials by a suitably qualified person, provision of adequate drainage infrastructure, geotechnical assessment undertaken at closure. Certification by a suitably qualified expert that the final landform is stable and constructed according to design criteria.		P				Ne				L	

Ref.				Risk Description				Control Effectiveness	Risk Evaluation						Risk Rating			
Risk Type (T=Threat	Category	Subcategory	Item	Risk Scenario/Threat Title	Causes (Triggers / Indicators)	Impacts (Consequences)	Existing Controls		Likelihood - Freq	Likelihood - Prob	Health	Safety	Environment	Compliance	Health	Safety	Environment	Compliance
T	**D**	**03**		**Stable - erosional risk**														
T	D	03	01	Initial/ongoing gully, pipe and/or sheet erosion of the low walls and high walls	Faults and fractures in the underlying geology, adverse weather events	Localised land impacts, water quality impacts (water contained within the pit)	Landform design in accordance with geotechnical assessment of the site, monitoring and management as required.		P				Ne				L	
T	D	03	02	Initial/ongoing gully, pipe and/or sheet erosion of the low walls and high walls	Inadequate design, erodible topsoil and subsoils	Localised land impacts, water quality impacts (water contained within the pit)	Landform including highwalls and site drainage network to be constructed as designed. Monitoring of drainage network performance, prompt remediation. Certification by a suitably qualified person that the final landform is stable and constructed according to design criteria.		P				Ne				L	
T	D	03	03	Initial/ongoing gully, pipe and/or sheet erosion of the low walls and high walls	Adverse climatic events and/or climatic sequences beyond design capacity	Localised land impacts, water quality impacts (water contained within the pit)	Final void designed as to prevent excessive runoff from entering the final void during rainfall events. Prompt remediation, post-weather event monitoring of final void water quality, high walls and low wall.		P				Ne				L	
T	**D**	**04**		**Non-polluting - geochemical risk**														
T	D	04	01	Mine affected water contributes to natural groundwater body	Void longterm water level is above natural groundwater level	Adverse water quality and dependent ecosystem impacts	Final void hydrological assessment shows final voids as a groundwater sink. Monitoring of pit water quality to be undertaken and assessed against model predictions. Geotechnical/geochemical assessment, groundwater monitoring program		U				Hi				M	
T	**D**	**05**		**Non-polluting - other environmental harm**														
T	D	05	01	Not applicable														
T	**F**			**In-Pit Tailings (TDP) rehabilitated**														
T	**F**	**01**		**Safe**														
T	F	01	01	Surface roughness (rockiness, depressions) in excess of that expected for the PMLU	Erosion gullies etc due to subsoil/ topsoil characteristics/availability, inadequate surface preparation, localised settlement, rock used for erosion control	Safety hazard for personnel, stock and wildlife	Surface preparation measures (initial), design specifications, monitoring, maintenance controls (pre-closure), risk assess controls when designed and placed and modify as required, post-closure monitoring.		P			Mi				M		
T	**F**	**02**		**Stable - geotechnical risk**														
T	F	02	01	Differential settlement	Materials used for capping, capping methodology	Localised land impacts	Extended non-operational drying period, geotech testing, increased depth of capping material		P				Mo				**H**	
T	**F**	**03**		**Stable - erosional risk**														
T	F	03	01	Initial/ongoing gully, pipe and/or sheet erosion of rehabilitated areas	Erodible topsoils and subsoils, adverse weather events	Localised land impacts and downstream water quality impacts	Adequate/effective subsoil and topsoil amelioration, prompt revegetation establishment, revegetation monitoring and management as required.		U				Mi				M	
T	F	03	02	Initial/ongoing gully, pipe and/or sheet erosion of rehabilitated areas	Inadequate rehabilitation drainage capacity and/or design	Localised land impacts and downstream water quality impacts	Downstream sedimentation controls, revegetation, rehabilitation and water quality monitoring, maintenance and repair activities as required.		U				Mi				M	
T	F	03	03	Initial/ongoing gully, pipe and/or sheet erosion of rehabilitated areas	Adverse climatic events	Localised land impacts and downstream water quality impacts	Downstream sedimentation controls, revegetation, rehabilitation and water quality monitoring, maintenance and repair activities as required.		U				Mi				M	
T	F	03	04	Initial/ongoing gully, pipe and/or sheet erosion of rehabilitated areas (medium-long term risk)	Rehabilitation failure/ revegetation disease, climatic events	Localised land impacts and downstream water quality impacts	Landform design similar contour to surrounding environment, adequate/effective subsoil and topsoil amelioration, prompt revegetation establishment, revegetation monitoring and management as required.		P				Mo				**H**	

Ref.				Risk Description				Control Effectiveness	Risk Evaluation						Risk Rating			
Risk Type (T=Threat	Category	Subcategory	Item	Risk Scenario/Threat Title	Causes (Triggers / Indicators)	Impacts (Consequences)	Existing Controls		Likelihood - Freq	Likelihood - Prob	Health	Safety	Environment	Compliance	Health	Safety	Environment	Compliance
T	**F**	**04**		**Non-polluting - geochemical risk**														
T	F	04	01	Acid and saline drainage	Adverse geochemical characteristics, inadequate design	Impacts to groundwater and GDEs, downstream water quality impacts	Water quality monitoring program, NAPP tailings materials, design specification (water shedding)		U				Hi				M	
T	**F**	**05**		**Non-polluting - other environmental harm**														
T	F	05	01	Contaminants in seepage and surface water runoff	Adverse geochemical characteristics, inadequate capping design and implimentation	Surface water impacts, groundwater impacts	Groundwater and surface water monitoring program, seal coal seam aquifers, NAPP tailings materials		U				Hi				M	
T	**D**	**06**		**0**														
T	D	06	01	Insufficient pasture productivity or density/diversity of vegetation in PMLU	Weather, poor soil characteristics, poor management practices impacting germination, vegetation establishment and PMLU density/diversity metrics	Insufficient pasture productivity, habitat unsuitable for native fauna	Ongoing grazing management, soil amelioration, pasture performance monitoring		P				Mo				**H**	
T	D	06	02	Pests and weeds	Poor local, regional or site property management practices.	Increased risk of not achieving designated PMLU	Pest and weed management practices, monitoring programs to allow early detection and management, intensify monitoring and management measures as appropriate.		U				Mo				M	
T	D	06	03	Insufficient quality topsoil resources onsite available to undertake rehabilitation activities	Poor management practices, shortage of topsoil resources	Increased risk of not achieving PMLU	Implementation of topsoil management plan, annual review of topsoil inventory.		U				Mo	Mi			M	M
T	**G**			**Mine infrastructure and exploration areas**														
T	**G**	**01**		**Safe**														
T	G	01	01	Surface roughness (rockiness, depressions) in excess of that expected for PMLU	Inadequate surface preparation, localised settlement, erosion gullies	Safety hazard for personnel, stock and wildlife	Surface preparation measures (initial), monitoring, maintenance controls (pre-closure), rehabilitation monitoring assessment, undertake repairs and maintenance as required		U			Mi				M		
T	**G**	**02**		**Stable - geotechnical risk**														
T	G	02	01	Not applicable														
T	**G**	**03**		**Stable - erosional risk**														
T	G	03	01	Initial/ongoing gully, pipe and/or sheet erosion of rehabilitated areas	Erodible topsoils and subsoils, adverse weather events	Localised land impacts and downstream water quality impacts	Landform design moderating slope, adequate/effective subsoil and topsoil amelioration, prompt revegetation establishment, revegetation monitoring, revegetation maintenance and repairs as required, modify revegetation methods and techniques to improve rehabilitaiton success when required, sediment controls during establishment		U				Mi				M	
T	G	03	02	Initial/ongoing gully, pipe and/or sheet erosion of rehabilitated areas	Inadequate rehabilitation drainage capacity and/or design	Localised land impacts and downstream water quality impacts	Drainage network design with acceptable design standards for drainage structures, avoidance of flow concentration, sub-catchment delineation, sufficient water storage structures, engineered flow channels, adequate and effective revegetation techniques, rehabilitation monitoring and management as required		U				Mi				M	
T	G	03	03	Initial/ongoing gully, pipe and/or sheet erosion of rehabilitated areas	Adverse climatic events and/or climatic sequences beyond design capacity	Localised land impacts and downstream water quality impacts	Downstream sedimentation controls, revegetation, monitoring and maintenance		U				Mi				M	
T	G	03	04	Initial/ongoing gully, pipe and/or sheet erosion of rehabilitated areas (medium-long term risk)	Rehabilitation failure / vegetation disease / loss, climatic events	Localised land impacts and downstream water quality impacts	Landform design moderating slope, adequate/effective subsoil and topsoil amelioration, prompt and effective revegetation establishment, revegetation monitoring and management as required		U				Mo				M	

Ref.				Risk Description				Control Effectiveness	Risk Evaluation						Risk Rating			
Risk Type (T=Threat	Category	Subcategory	Item	Risk Scenario/Threat Title	Causes (Triggers / Indicators)	Impacts (Consequences)	Existing Controls		Likelihood - Freq	Likelihood - Prob	Health	Safety	Environment	Compliance	Health	Safety	Environment	Compliance
T	**G**	**04**		**Non-polluting - geochemical risk**														
0	0	0	01	Not applicable														
T	**G**	**05**		**Non-polluting - other environmental harm**														
T	G	05	01	Contaminated land	Operational phase industrial use of land	Land contamination, surface water impacts	Appropriate infrastructure management, storage and bunding of hazardous materials, contaminated land assessment at closure, contingent provision for clean-up and proactive spills management, water quality monitoring		U				Mo				M	
T	**G**	**06**		**Sustainable - PMLU**														
T	G	06	01	Insufficient pasture productivity or density / diversity of vegetation PMLU	Weather, poor soil characteristics, poor management practices impacting germination, vegetation establishment and PMLU density/diversity metrics	Insufficient pasture productivity, habitat unsuitable for native fauna	Ongoing grazing management, soil amelioration, pasture performance monitoring		U				Mo				M	
T	G	06	02	Pests and weeds	Poor local, regional or site property management practices, weed invasion	Increased risk of not achieving designated PMLU	Pest and weed management practices, monitoring programs to allow early detection and management, intensify monitoring and management measures as appropriate.		U				Mo				M	
T	G	06	03	Insufficient quality topsoil resources onsite available to undertake rehabilitation activities	Poor management practices, shortage of topsoil resources	Increased risk of not achieving PMLU	Implementation of topsoil management plan, annual review of topsoil inventory.		U				Mo	Mi			M	M
T	**H**			**Creek diversions (permanent)**														
T	**H**	**01**		**Safe**														
T	H	01	01	Surface roughness (rockiness, depressions) in excess of that expected for the PMLU	Challenging subsoils/ topsoils, inadequate surface preparation, localised settlement, erosion gullies	Safety hazard for personnel and wildlife	Surface preparation measures (initial), monitoring, maintenance controls (pre-closure).		P			Mi				M		
T	**H**	**02**		**Stable - geotechnical risk**														
T	H	02	01	Not applicable														
T	**H**	**03**		**Stable - erosional risk**														
T	H	03	01	Diversion doesn't achieve geomorphic stability	Erodible topsoils and subsoils, Adverse climatic events and/or climatic sequences beyond design capacity, Rehabilitation failure/ vegetation disease/loss	Ongoing watercourse erosion, water quality impacts, bank stability impacts	Geomorphic diversion design, adequate/effective subsoil and topsoil amelioration, prompt revegetation establishment, revegetation monitoring, revegetation maintenance and repairs as required, sediment controls during establishment, bank stabilisation if required. Geomorphic monitoring program for at least life of mine		U				Mo				M	
T	**H**	**04**		**Non-polluting - geochemical risk**														
T	H	04	01	Not applicable														
T	**H**	**05**		**Non-polluting - other environmental harm**														
T	H	05	01	Downstream water quality impacts and sedimentation	Erodible topsoils and subsoils, Adverse climatic events and/or climatic sequences beyond design capacity, Rehabilitation failure/ vegetation disease/loss	Water quality impacts, bank stability impacts	Geomorphic diversion design, adequate/effective subsoil and topsoil amelioration, prompt revegetation establishment, revegetation monitoring, revegetation maintenance and repairs as required, sediment controls during establishment, bank stabilisation if required. Geomorphic monitoring program for at least life of mine		U				Mo				M	

Ref.				Risk Description				Control Effectiveness	Risk Evaluation						Risk Rating			
Risk Type (T=Threat	Category	Subcategory	Item	Risk Scenario/Threat Title	Causes (Triggers / Indicators)	Impacts (Consequences)	Existing Controls		Likelihood - Frec	Likelihood - Prol	Health	Safety	Environment	Compliance	Health	Safety	Environment	Compliance
T	**H**	**06**		**Sustainable - PMLU**														
T	H	06	01	Pests and weeds	Poor local, regional or site property management practices.	Increased risk of not achieving designated PMLU	Pest and weed management practices, monitoring programs to allow early detection and management, intensify monitoring and management measures as appropriate.		U				Mi				M	
T	H	06	02	Insufficient riparian habitat (native vegetation) density/diversity and recruitment	Weather, poor soil characteristics, poor management practices impacting germination, vegetation establishment and PMLU density/diversity metrics	Insufficient vegetation productivity	Adaptive rehabilitation methodologies, management and maintenance activities, rehabilitation performance monitoring and assessment, undertake revegetation improvement works as required.		P				Mo				**H**	
T	H	06	03	Insufficient quality topsoil resources onsite available to undertake rehabilitation activities	Poor management practices, shortage of topsoil resources	Increased risk of not achieving PMLU	Implementation of topsoil management plan, annual review of topsoil inventory.		U				Mi	Mo			M	M
T	**H**			**Retained flood levees**														
T	**H**	**01**		**Safe**														
T	H	01	01	Failure of retained levees	Extreme flood events, adverse weather conditions	Risk of drowning of personnel, stock or wildlife during flood events	Retained levee design. Ensuring no personnel or stock access to areas protected by retained levees during flood events		R			Hi				M		
T	**H**	**02**		**Stable - geotechnical risk**														
T	H	02	01	Flood levee failure	Structure failure, landform not constructed to design, physical material properties, adverse rainfall event,	Flood and overtopping of the retained southwest void	Retained levee design, geotechnical assessment undertaken at closure.		R				Mo				L	
T	**H**	**03**		**Stable - erosional risk**														
T	H	03	01	Initial/ongoing gully, pipe and/or sheet erosion of rehabilitated areas	Erodible topsoils and subsoils, adverse weather events	Localised land impacts and downstream water quality impacts	Landform design moderating slope, adequate/effective subsoil and topsoil amelioration, prompt revegetation establishment, revegetation monitoring, revegetation maintenance and repairs as required, modify revegetation methods and techniques to improve the likelihood of rehabilitation succession rehabilitated slopes when required, sediment controls during establishment.		P				Mi				M	
T	H	03	02	Initial/ongoing gully, pipe and/or sheet erosion of rehabilitated areas	Adverse climatic events and/or climatic sequences beyond design capacity	Localised land impacts and downstream water quality impacts	Prompt revegetation, regular (typically annual) review of design parameters, undertake repairs and maintenance as required, prompt remediation and causal feedback loop to water management system review.		U				Mi				M	
T	H	03	03	Initial/ongoing gully, pipe and/or sheet erosion of rehabilitated areas	Inadequate rehabilitation drainage capacity and/or design	Localised land impacts and downstream water quality impacts	Drainage network design with acceptable design standards for drainage structures, avoidance of flow concentration, sub-catchment delineation, sufficient water storage structures, engineered flow channels, effective revegetation techniques, rehabilitation monitoring and management as required		U				Mi				M	
T	H	03	04	Initial/ongoing gully, pipe and/or sheet erosion of rehabilitated areas (medium-long term risk)	Rehabilitation failure/ vegetation disease/loss, climatic events (drought)	Localised land impacts and downstream water quality impacts	Landform design moderating slope, adequate/effective subsoil and topsoil amelioration, prompt revegetation establishment, revegetation monitoring and assessment, modify rehabilitation methods and techniques to improve the likelihood of revegetation success on rehabilitated slopes, undertake repairs and maintenance as required.		P				Mo				**H**	

Ref.				Risk Description					Risk Evaluation						Risk Rating			
Risk Type (T=Threat	Category	Subcategory	Item	Risk Scenario/Threat Title	Causes (Triggers / Indicators)	Impacts (Consequences)	Existing Controls	Control Effectiveness	Likelihood - Frequency	Likelihood - Probability	Health	Safety	Environment	Compliance	Health	Safety	Environment	Compliance
T	**H**	**04**		**Non-polluting - geochemical risk**														
T	H	04	01	Not applicable														
T	**H**	**05**		**Non-polluting - other environmental harm**														
T	H	05	01	Not applicable														
T	**H**	**06**		**Sustainable - PMLU**														
T	H	06	01	Pests and weeds	Poor local, regional or site property management practices.	Increased risk of not achieving designated PMLU	Pest and weed management practices, monitoring programs to allow early detection and management, intensify monitoring and management measures as appropriate.		U				Mo				M	
T	H	06	02	Insufficient pasture productivity or density / diversity of vegetation PMLU	Weather, poor soil characteristics, poor management practices impacting germination, vegetation establishment and PMLU density/diversity metrics	Insufficient vegetation productivity	Adaptive rehabilitation methodologies, management and maintenance activities, rehabilitation performance monitoring and assessment, undertake revegetation improvement works as required.		P				Mo				**H**	
T	H	06	03	Insufficient quality topsoil resources onsite available to undertake rehabilitation activities	Poor management practices, shortage of topsoil resources	Increased risk of not achieving PMLU	Implementation of topsoil management plan, annual review of topsoil inventory.		U				Mo	Mi			M	M
				End of record														