



ACN 117 086 745

**EASTERN PROJECT AREA
 TENNANT CREEK, NORTHERN TERRITORY
 MINING MANAGEMENT PLAN 2018
 AUTHORISATION – 0463-04**

DISTRIBUTION:		DATE
Central Land Council	1	
Department of Primary Industry & Resources	2	
Emmerson Resources Limited	3	

Document Title:	Eastern Project Area MMP September 2018		
Document Path:	Tenements\Tenements & Compliance\Northern Territory Government\MMP\Eastern Project Area\Renewals\2018\ Eastern Project Area MMP September 2018	Copy No: 1	
Type: (Tick Box)	Controlled <input type="checkbox"/> Uncontrolled <input checked="" type="checkbox"/>	Issue: 1	Date: 07/09/18
Prepared By:	Emmerson Resources Ltd – Tenements & Compliance Department	PO Box 1573, West Perth WA 6872	
Authorised By:	Ana Liza Cuison - Exploration Manager		

CONTENTS

AMENDMENTS	3
1.0 OPERATOR DETAILS	4
1.1 ORGANISATIONAL STRUCTURE / CHART	5
1.2 WORKFORCE	6
2.0 IDENTIFIED STAKEHOLDERS AND CONSULTATION	6
3 PROJECT DETAILS	7
3.1 HISTORY OF DEVELOPMENT AND CURRENT STATUS	17
3.2 PROPOSED ACTIVITIES	21
4.0 CURRENT PROJECT SITE CONDITIONS	26
5.0 ENVIRONMENTAL MANAGEMENT SYSTEM / PLAN	31
5.1 ENVIRONMENTAL POLICY AND RESPONSIBILITIES	32
5.2 STATUTORY REQUIREMENTS	32
5.3 NON-STATUTORY REQUIREMENTS	33
5.4 INDUCTION AND TRAINING	33
5.5 IDENTIFICATION OF ENVIRONMENTAL ASPECTS AND IMPACTS	35
5.6 EMERGENCY PROCEDURES AND INCIDENT REPORTING	37
5.7 ENVIRONMENTAL AUDITS AND INSPECTIONS	37
5.8 ENVIRONMENTAL PERFORMANCE PROGRAMS AND REPORTING	37
6.0 EXPLORATION REHABILITATION	39
6.1 COSTING OF CLOSURE ACTIVITIES	40
6.2 PERFORMANCE OBJECTIVES	41

**Appendix 8 – Eastern Project Area September 2018 Proposed Drilling
Details Appendix 13 – Security Calculation**

AMENDMENTS

All amendments will be highlighted in **yellow**.

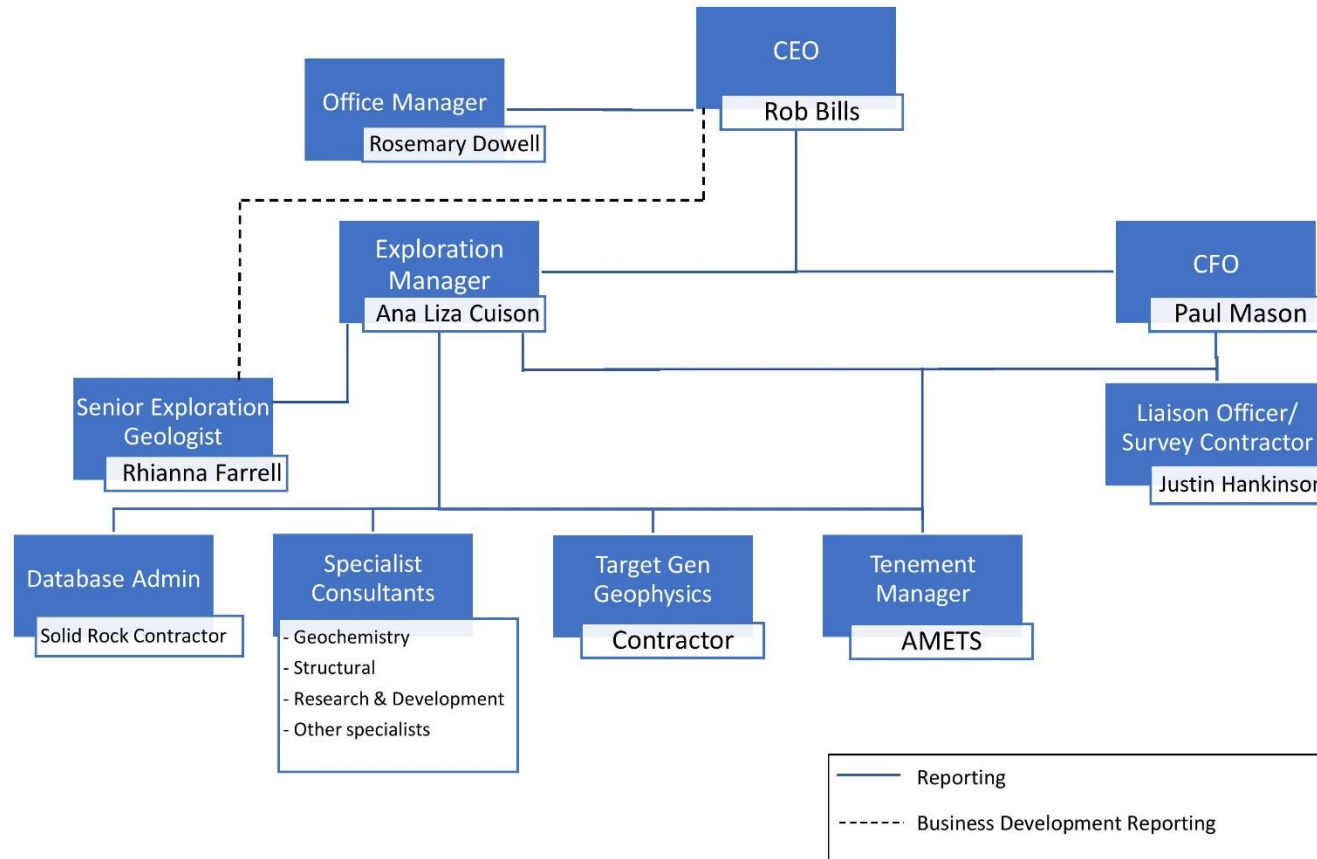
Amendments relate to the proposal for new drilling campaigns at a number of EPA prospects;

Section	Amendment
3.2 Proposed Activities	Inclusion of new drilling at; Black Snake 30 RC holes; Golden Kangaroo East 35 RC holes; Three-Thirty 25 RC holes; The Susan 20 RC holes; and Explorer 195 10 RC holes.
Figures 7 – 10c	Updated figures 7 – 10 with new proposed target areas and inclusions of figures 10a, b & c to display proposed drill hole locations.
6.1 Costing of Closure Activities	Updated to include new drilling and reference to 129 holes in security calculation.
6.2 Performance Objectives	Updated to reflect new September signing date
Appendix 8	Updated to reflect new proposed drilling
Appendix 13	Updated Security Calculation

1.0 OPERATOR DETAILS

Operator Name:	Emmerson Resources Ltd (Emmerson)
Key Contact Person/s:	Ana Liza Cuison Exploration Manager
Postal Address:	Emmerson Resources Limited PO Box 1056, West Leederville WA 6901
Street Address:	Emmerson Resources Limited 3 Kimberley Street, West Leederville WA 6007
Phone:	Ph: (08) 9381 7838 After Hours: 0419 924 989 (Ana Liza Cuison Exploration Manager)
Fax:	Fax: (08) 9381 5375
Email:	<u>acuison@emmersonresources.com.au</u> (Ana Liza Cuison; Exploration manager)

1.1 ORGANISATIONAL STRUCTURE / CHART



1.2 WORKFORCE

The workforce on the Eastern Project Area (EPA) will vary as needed, and will include, but is not limited to;

- 1 RC Drill Rig and crew; 3 people (Bullion Drilling)
- 1 Diamond Drill Rig and crew; 3 people (GMP Drilling)
- 1 RAB Drill Rig and crew; 3 people (Bullion Drilling)
- 1 Geophysical crew - 3 – 6 people (Daishsat Geophysics and/or ABIM Solutions)
- 1 Geologist (Emmerson)
- 1 or 2 Field Assistants (Emmerson)
- Visits by supervising staff or consultants

2.0 IDENTIFIED STAKEHOLDERS AND CONSULTATION

Identified parties include:

- Emmerson Resources Ltd, related companies and shareholders
- Territory Resources Limited Tennant Creek
- Aboriginal Traditional Owners
- Tennant Creek Station
- Central Land Council (CLC)
- Aboriginal Area Protection Authority (AAPA)
- NTWorksafe
- Department of Primary Industry & Resources
- Department of Environment and Natural Resources
- Department of Infrastructure, Planning & Logistics
- Department of Tourism & Culture - Parks and Wildlife Commission
- Department of Tourism & Culture - Heritage
- Northern Territory Environmental Protection Authority
- National Trust NT
- Tennant Creek Town Council
- Power & Water Corporation

Emmerson maintains a high level of communication and consultation with the key stakeholders within the larger group of identified stakeholders, as detailed above. The key stakeholders and Emmerson's consultation is detailed below;

Aboriginal Traditional Owners & CLC – Emmerson meet with the Traditional owners many times throughout the year in various forums. Exploration to be conducted in new areas requires a ground clearance/ heritage clearance survey to be conducted. 2 or 3 times a year Emmerson will hold a liaison meeting where all Traditional Owners and facilitated by the CLC, are invited to attend the CLC's office in Tennant Creek where representatives from Emmerson and occasionally Evolution will present details of completed exploration and proposed exploration, discuss future exploration and potential impacts for their traditional lands, request clearance surveys to be conducted and answer any questions. The most recent liaison meeting was held on Thursday 9 March 2017.

Department of Primary Industry & Resources (DPIR) – Emmerson has a constant line of communication and consultation open with DPIR and occurs on an as needs basis, as well as an annual exploration update, usually occurring at the beginning of each calendar year which outlines results from the previous year's exploration work, and a high level overview of the proposed

exploration for the coming calendar year, as well as raising and/or addressing any exploration/titles/compliance issues outstanding.

Tennant Creek Pastoral Station – Emmerson has a constant line of communication open with Tennant Creek Station to keep them informed of our activities and how the station and its operations may be affected. Further to this we have also a signed Land Access Agreement, included as Appendix 14.

3 PROJECT DETAILS

Authorisation No.	0463-04
Project Name:	Eastern Project Area (EPA)
Location:	The Eastern Project Area covers a number of tenements located to the east and south east of the Tennant Creek Township, between 1 and 34km in distance. Refer to Figures 1 - 6
Site Access:	Refer to Figure 9
Mining Interest/s:	Refer to Appendix 1
Title holder/s:	Refer to Appendices 3 & 5

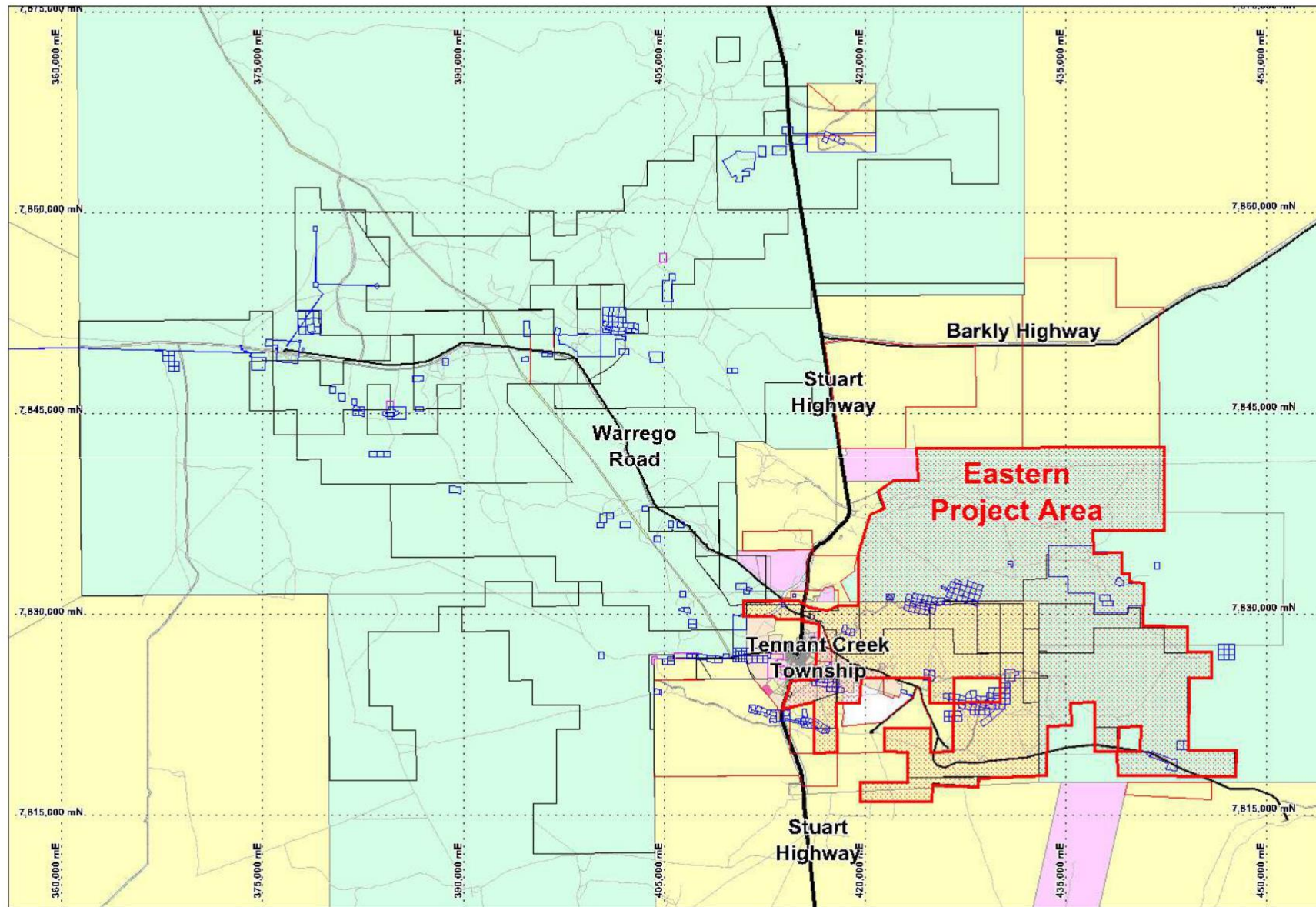


Figure 1: EPA Location

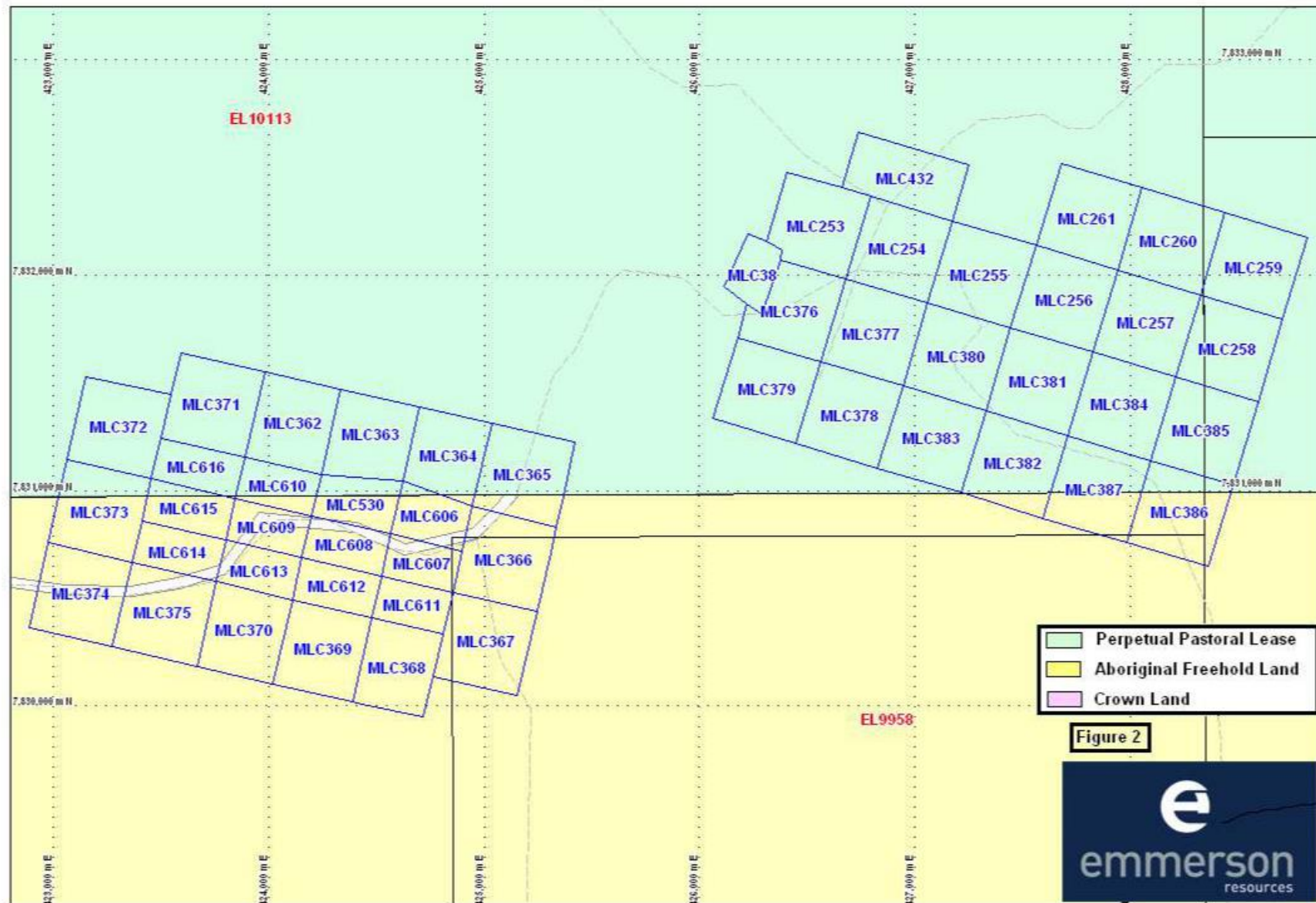


Figure 2: EPA Tenure

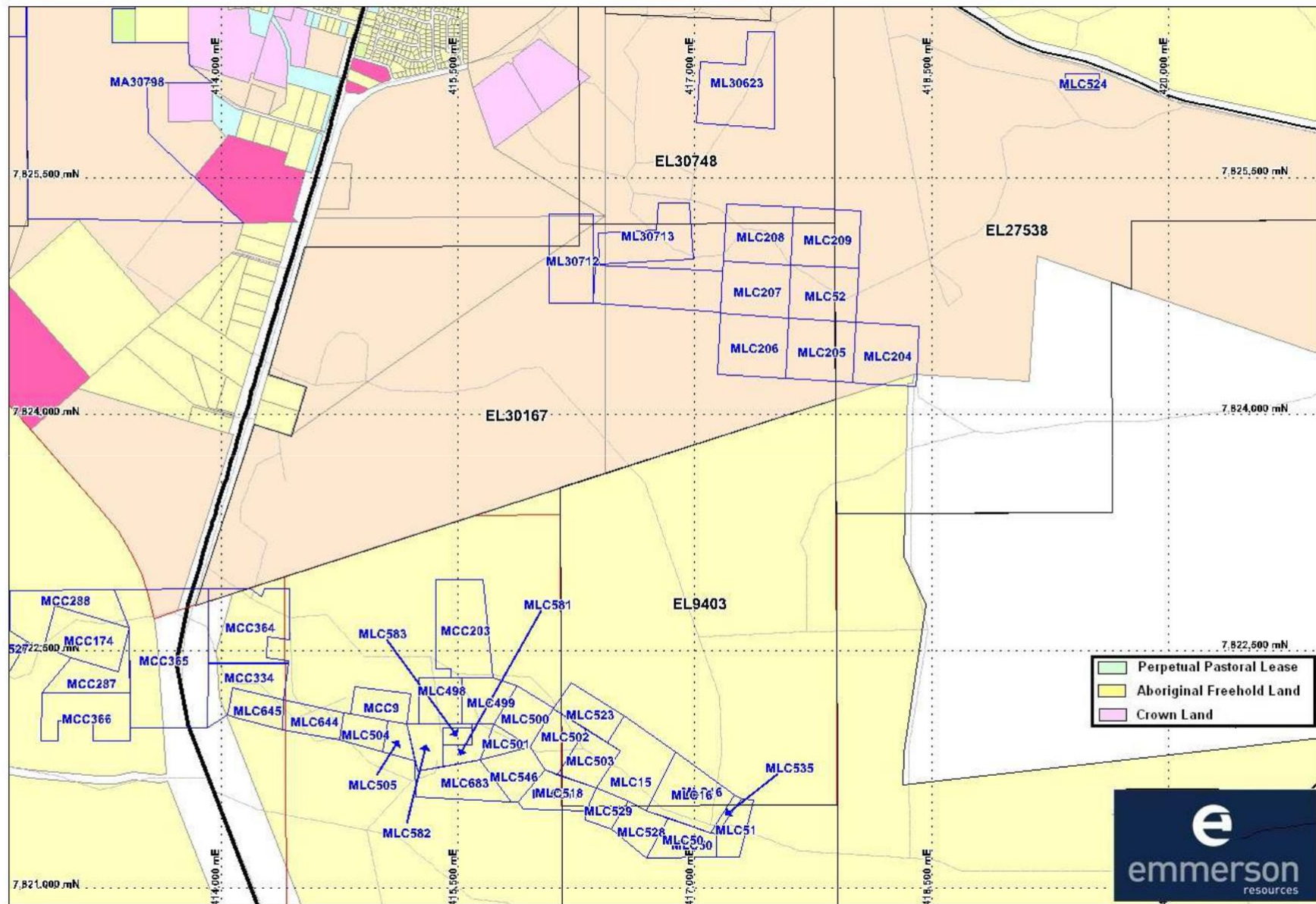


Figure 3: EPA Tenure

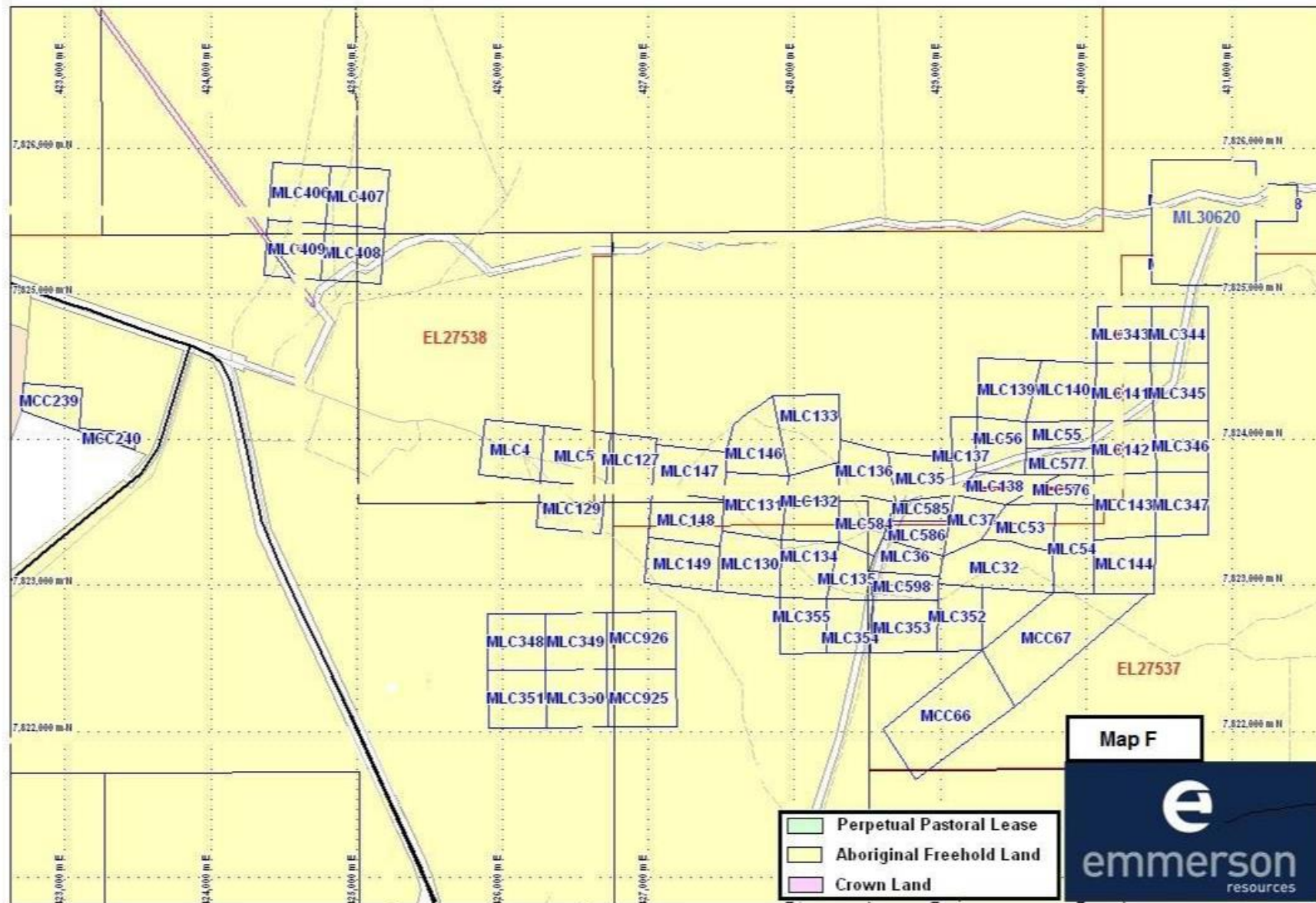


Figure 4: EPA Tenure



Figure 5: EPA Tenure

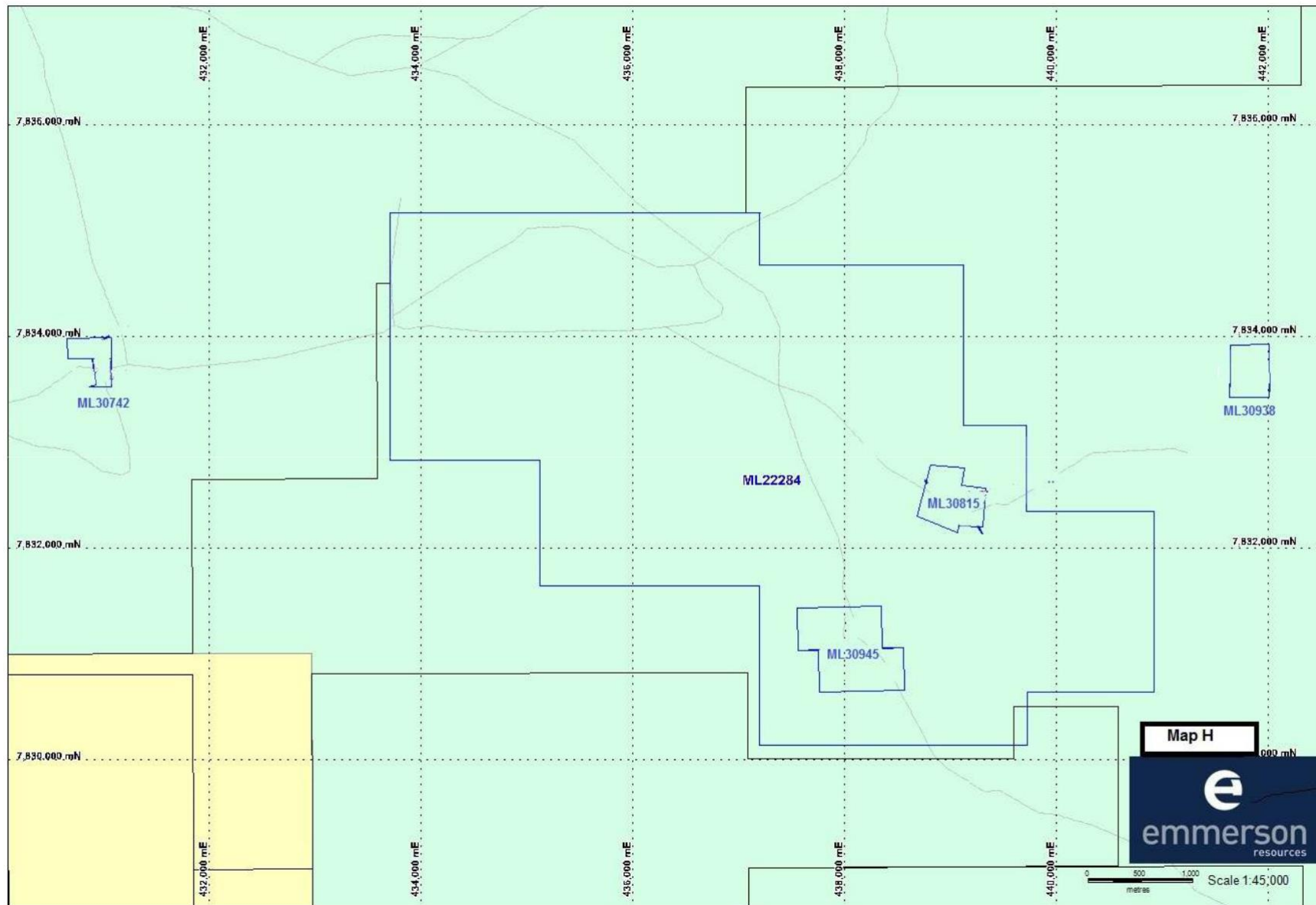


Figure 6: EPA Tenure

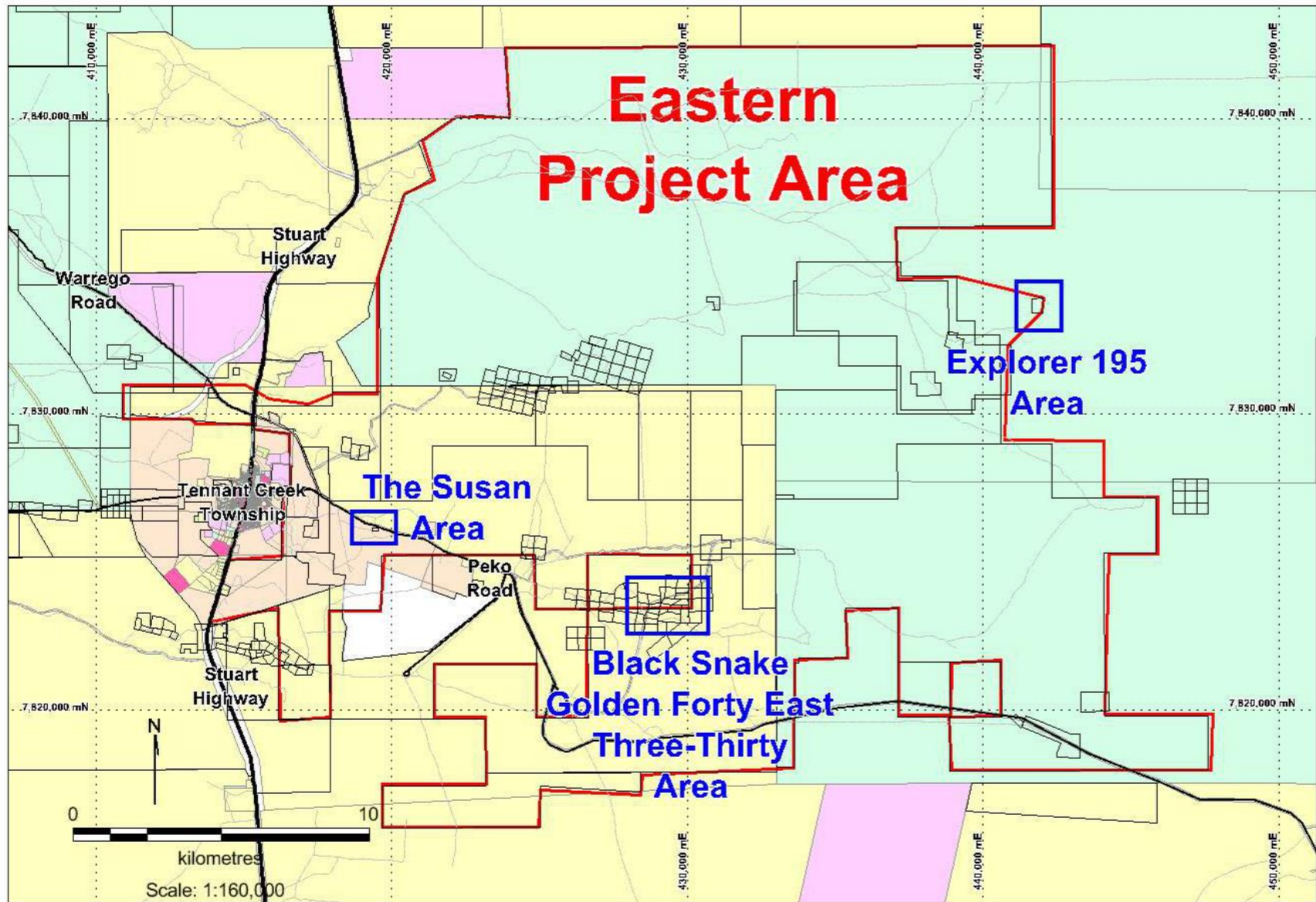


Figure 7: Target Areas

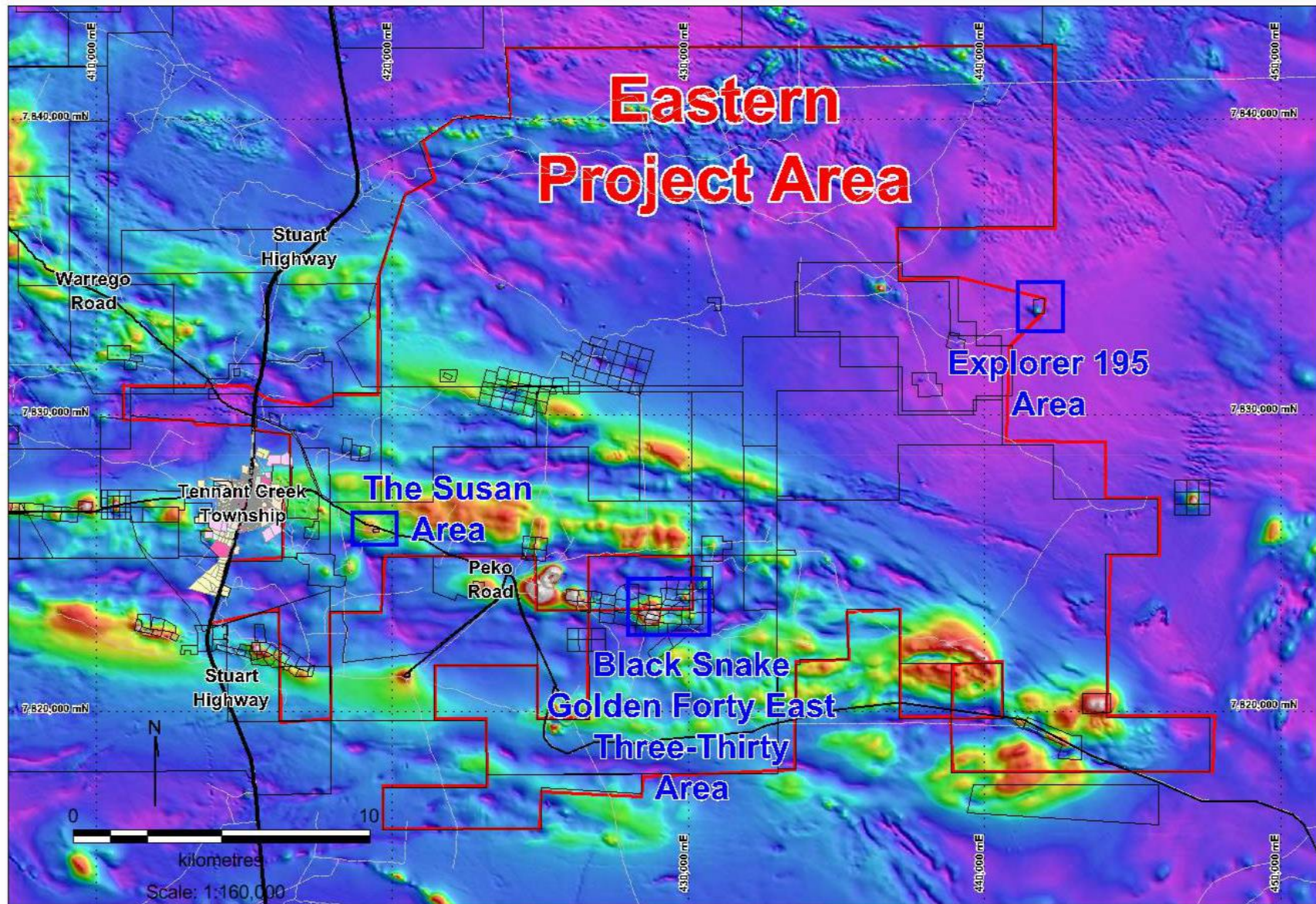


Figure 8: Target Areas vs. VRMI

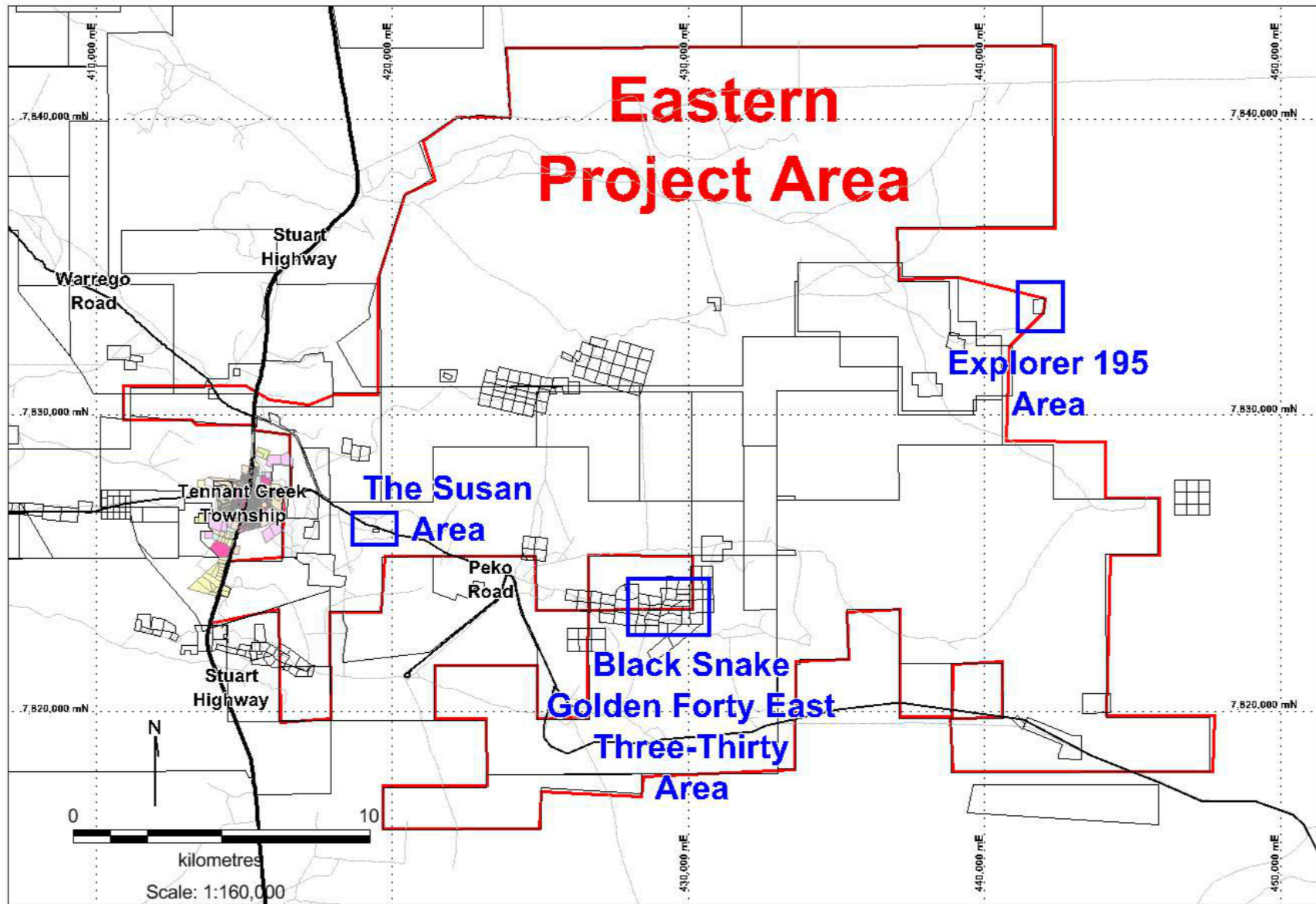


Figure 9: Displays Target Areas vs Access Tracks (grey)

3.1 HISTORY OF DEVELOPMENT AND CURRENT STATUS

Historical Mining/Exploration

The EPA has been subjected to intermittent prospecting, mining and exploration more or less continually since the Tennant Creek goldfield came into being in the early 1930's. Historical Mines with details of production and period of production is detailed in Table 1 below;

Name	Operation Period	Location (GDA94)		Au		Cu	
		East	North	Grade	Oz	Grade	t
ACE HIGH	1941-1942	417423	7829646	64.4	113.4		0
AGA KHAN	1958-1959	426073	7831943	272.7	96.5		0
AJAX	1938	417144	7826157	7.5	4.3		0
ARGO	1986-1988	418606	7824787	8.3	82864	0.8	2057
ARIZONA	1938-1941	423072	7830929	13.9	33		0
BIG BOULDER	?	413027	7830969	0	0		0
BLACK BOY	Pre-1943?	432176	7819845	33	47		0
BLACK CAT	1936-1942	430813	7833828	15.6	1125.4		0
BLACK SNAKE	1937-1947	429560	7823502	0	0		0
BLUE BIRD	1936-1939	448511	7827142	10.9	61		0
BLUE MOON	1935-1973	439228	7832370	87.9	13417		0
BURNT SHIRT	1934-1959, 1966	416886	7829504	18.8	2025.5		0
CATS WHISKERS	1938-1941	416447	7821485	9	112.5		0
COMET	No production	424765	7825501	0	0		0
COMSTOCK	1988	442540	7819071	13	1151		0
COPPER HEAD	No production	425536	7832345	0	0		0
DESERT HOPE	1938-1940	443858	7818541	21.7	48.4		0
DOLOMITE	1937, 1984-89	417028	7825170	9.7	640.1		0
DOT	1937-38, 1990s	413328	7830870	5.8	13.5		0
ELDORADO	1934-1982, 1989-1992	415528	7821970	17.9	121961		0
ELLEN M	1937	416367	7821510	15.3	15.7		0
ENTERPRISE	1935-1963, 1984	414628	7821970	20.3	6599		0
EXPLORER 109	?	418938	7828685	0	0		0
GEM	1947 No Production	418476	7828741	0	0		0
GIGANTIC	1937-1951	436828	7834170	23.6	865.7		0
GOLDEN FORTY	1934-1950, 1969-1984	428636	7823424	11.9	56640		0
GOLDEN FORTY EAST	1938-1950	428881	7823347	0	0		0
GOLDEN KANGAROO	1938-39, 1967-68	429934	7823848	32	51.4		0
GOLDEN KEY	1939	427607	7831789	44.4	15.4		0
GOLDEN MILE	1936-1939	445728	7826870	20.7	96.2		0

GREAT BEAR	1936-1950	427928	7830170	18	192.1		0
GREAT EASTERN	1935-1950	429307	7823257	15.2	410.4		0
HOPEFUL STAR	35-41, 48-49, 69, 83	431106	7832782	8.7	758.8		0
HOPEFUL STAR EAST	1936-7, 69-78	431402	7832634	5.1	170		0
INTERNATIONAL	1939	419717	7825859	2.9	1.9		0
IRISH EMBLEM	?	413628	7830220	0	0		0
JOKER	36-42,61-2,85-6	427743	7821640	6	990.2		0
KATHLEEN	1937-1941	417928	7829100	20.5	1154.2		0
KATHLEEN SOUTH	?	417781	7828888	0	0		0
KIAORA	1935-1976	431289	7825670	19.1	1019.2		0
KOALA	?	445128	7826620	0	0		0
LADY MARY	1938	438130	7830713	49.6	18.8		0
LEICHART ONE	1935-1948	417214	7829422	24.1	891.8		0
LEICHART TWO	1935-1948	417526	7829204	0	0		0
LITTLE WONDER	1937-38	427887	7832836	7.3	27.4		0
LONE STAR	1934-1960	424235	7830731	17.6	5665		0
MAMMOTH	1935-1937	427157	7832975	8.8	126.2		0
MAPLE LEAF	1948-1950	424992	7830915	0	25.7		0
MAURETANIA	1948	430961	7833309	32	216		0
MEMSAHIB	1937-1949	426136	7832153	26.3	173.2		0
METALLIC HILL	1938-1940	437953	7831198	23.4	150.1		0
MINT	1938	425550	7832158	8.9	25.2		0
MT MARGARET	?	428704	7833120	0	0		0
NEW HOPE	1937-1940, 1986	441064	7819693	37.7	1479		0
NEW HOPE EAST	1937-1940	441253	7819615	0	0		0
NEW MOON	1948	432271	7833373	5	12.9		0
ORTELLE STAR	1950	418147	7828816	8.4	9.1		0
PATTIES	1939-1972	414884	7821974	22.9	1549.7		0
PERSEVERANCE	1950-1951	447768	7827089	30	192		0
PERSEVERANCE EXT	?	447403	7827121	0	0		0
PINNACLES	1933-1950, 1967	417397	7826148	31.1	1401.7		4
PLAIN JANE	1936-1951	424461	7830856	17.4	667.7		0
PLUMB	?	442093	7819244	0	0		0
PUP	1951	416728	7825170	10	38.6		0
RED TERROR	1936-1949	432603	7819714	87.2	1690.1		0
RENATE	1935-1937	438028	7827670	24	15.6		0
RISING SUN	1933-51, 1969-84	427559	7819824	29.8	10043		0
RISING SUN WEST	1986	427511	7819811	19.1	4268		0
SHAMROCK	1936-1939	414128	7830470	4.8	9.6		6
SUSAN	1959-1960	419440	7826099	9.2	128.6		0
THE MOUNT	1937-1941	415885	7821686	8	59		0
THREE KEYS	1938-1942	427683	7833058	20.5	306.9		0

THREE THIRTY	1937-1947	429680	7823235	14.7	817.5		0
TRUE BLUE	1939, 1947	421828	7831170	16.1	15		0
TRUMP	1949	425643	7830743	22	4		0
TUNNEL	1939-1941	433094	7822543	11	22.7		0
UNNAMED	?	428300	7832856	0	0		0
VALHALLA	1939	426328	7832170	0	0		0
WEDGE	1950-1953	417063	7829445	9.3	345.7		0
YELLOW FLAME	1937-38	426265	7832365	55	22.5		0

Table 1: EPA Historical Mines

The Tennant Creek district is the traditional homeland of the Warumungu people, although several other tribal groups occur in the surrounding region, four (4) agreements cover the EPA as detailed in section 4.3. All Agreements cover exploration and mining on the EPA tenements and a wide surrounding area under the Aboriginal Land Rights Act.

Giants Reef Exploration Pty Ltd (Giants Reef) acquired all of the shares in Normandy Tennant Creek (NTC) in June 2001. On acquisition of NTC, Giants Reef changed the name of NTC to Santexco Pty Ltd (Santexco) and then transferred all assets including the tenure and mineral rights.

Emmerson Resources Ltd (Emmerson) purchased a group of assets including Giants Reef, Santexco and TC8 Pty Ltd (TC8) on 1 August 2006.

Recent history has seen exploration in the Eastern Project Area operate under four different MMP's, listed in table 2. On December 10 2008 Emmerson was granted Authorisation 0463-01 for the EPA, 0463-02 in 2010, 0463-03 in 2011 and 0463-04 in 2012 – 2016 this Authorisation has incorporated all historic liabilities and requirements of the historic MMP's, as listed in table 2, and have been included in the security calculation, refer to Appendix 13;

Authorisation	Project Name
0219-01	Cats Whiskers Mine
0156-01	Argo Mine
0040-02	Gosse Road
0422-01	Eldorado

Table 2: Historic Authorisations in the EPA.

No on ground exploration activities were conducted during 2017;

For all proposed programs and future generated programs to proceed, minor drill pad clearing may be required. This minor clearing will be completed by ensuring topsoil and seed stock is collected in a top soil dump at the edge of each drill pad. Minor earthworks may be required on the upgrading of existing access tracks.

As of 08 March 2018 Emmerson, considered rehabilitation of drilling conducted by Emmerson in the EPA to be completed as per the below table detailing a reconciliation of drilling proposed in the granted 2017 Authorisation and actual drilling conducted during the 2017 field season. The rehabilitation conducted during 2017 was completed as required in Authorisation 0463-04 and consisted of the outstanding Rehabilitation of 3 RC holes at the Black Snake prospect.

Table 3: 2017 Proposed, Drilling & Rehabilitation Reconciliation

Target Name	Tenement(s)	RAB Holes #	RAB (m)	RC Holes #	RC (m)	RC Pre Colls #	RC Pre Colls (m)	DDH Holes #	DDH (m)	Comments
Mauretania Trend Area	EL 28761			2	800					Proposed
				0	0					Drilled
				0	0					Rehabilitated
Regional West Area	EL's 10406 & 9403			2	800					Proposed
				0	0					Drilled
				0	0					Rehabilitated
Regional East Area	EL 28618 & ML 30716			2	800					Proposed
				0	0					Drilled
				0	0					Rehabilitated
Target Name	Tenement(s)	RAB Holes #	RAB (m)	RC Holes #	RC (m)	RC Pre Colls (m)	DDH Holes #	DDH (m)	Comments	
	Total			6	2,400					Proposed
				0	0					Drilled
				0	0					Rehabilitated

3.2 PROPOSED ACTIVITIES

Proposed activities for the EPA during the 2018 field season will include drill testing of the Mauretania discovery made in 2015, by drilling of Reverse Circulation (RC) holes.

Additional drill testing by RC drilling will be conducted at the following prospects;

Black Snake

Golden Kangaroo East

Three-Thirty

The Susan

Explorer 195

Exploration at these prospects will be focused around the testing of historical mineralisation intersections, drilling to test extensions to this mineralisation, the target areas are displayed in figures 7 – 10c.

Pre-drill testing work will involve structural interpretation, geological mapping, desktop historical compilation, assessment and modelling. The locations of the proposed test RC holes are detailed in figures 10a, b & c and appendix 8.

The exploration at all prospects will utilise existing roads, 4WD and fence line tracks and therefore no new tracks will be required. Should this change an addendum to this MMP will be submitted prior to commencement of works.

Further targets and refining of current targets may be generated from the proposed activities and the compilation and modelling of any data. During the capture, processing and assessment of this data Emmerson geoscientific staff and management may generate further target areas and further define existing target areas for drill testing. If these additional targets areas generate more drilling or ground disturbing activity in addition to the work programs currently proposed, they will be submitted as addendums to this MMP.

Table 4 details the proposed drill hole numbers and co-ordinates are detailed in Appendix 8 and displayed in figure 10a, b & c, along with the access tracks that will be utilized during exploration and drilling activities, any work conducted will be able to utilise the existing mine roads and tracks, due to the historical nature of the Tennant Creek Mineral field and numerous Pastoral Station tracks and fence line tracks all drilling conducted will utilise existing tracks, some upgrading may be required.

Presently the exploration program and other details for the 2018 field season (April – December) will be;

- RC drilling of the above selected targets,
- Targeting gold, copper and base metal mineralisation,
- Drilling is not likely to encounter radioactive material,
- Drilling may encounter ground water, which will be managed as outlined in the Water Management section of this MMP,
- Emmerson's RC drilling contractor, Bullion Drilling will conduct the drilling. Only minor earthworks to upgrade existing tracks and drill pad preparations may be required.
- Rehabilitation and soil management is outlined in Section 5.0 of this MMP,
- Generation of additional RC drilling aimed at prospective geological, geophysical and geochemical targets,
- Reassessment and evaluation of historical prospects within the regional area aimed at generating extensional RC drilling.

Drill pad size will be approximately 20m X 30m with a sump size of 2m X 5m were required. Total drill pad area that may be disturbed will be 7.74ha (no sumps are required for the proposed drilling) in addition an allowance for 2kms of track upgrades has been included in the security calculation to allow for any possible upgrades needed, therefore totalling a potential disturbed area of 9.74ha.

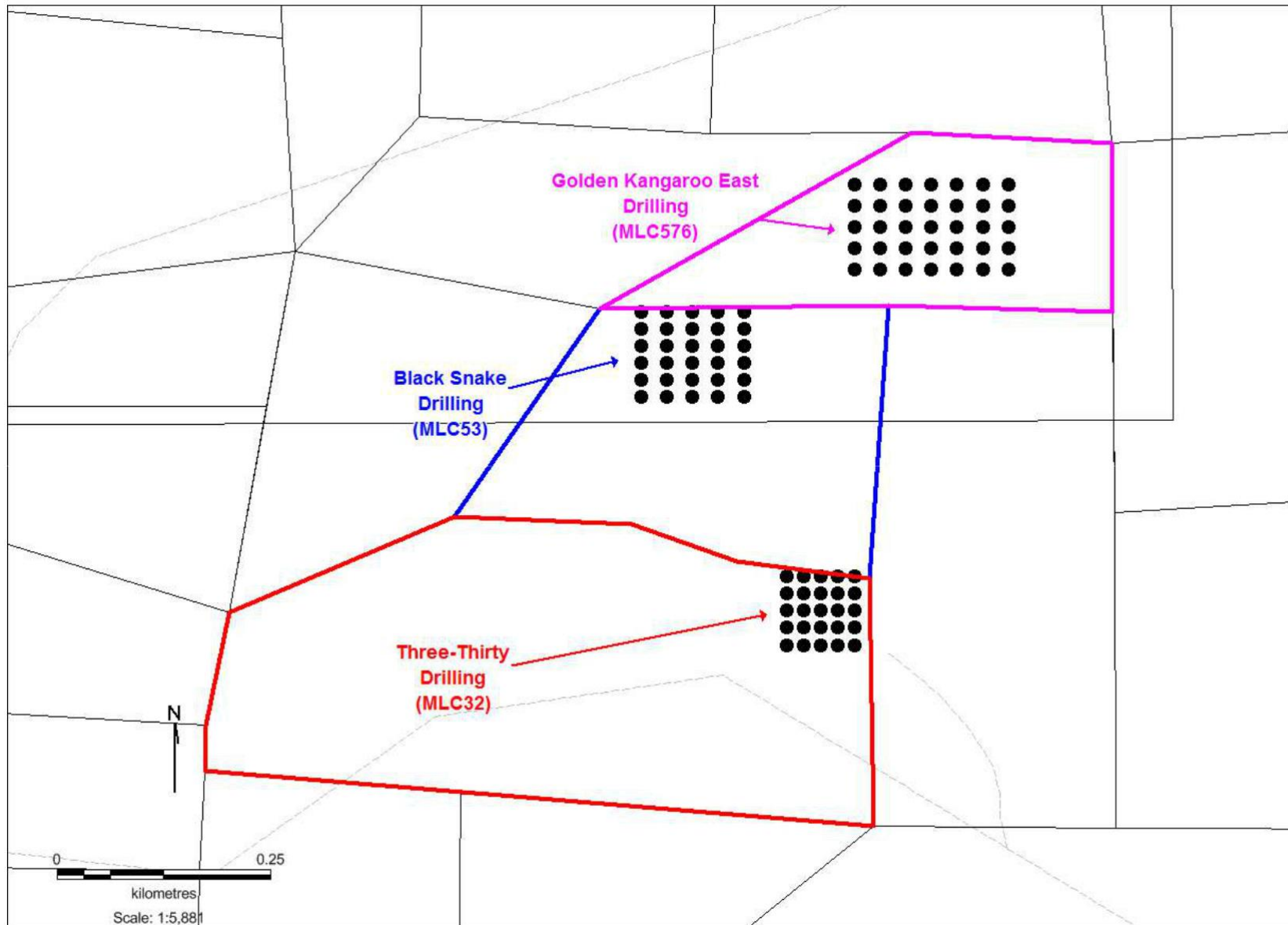


Figure 10a: Proposed drilling at 'Black Snake', 'Golden Kangaroo East' & 'Three-Thirty'.

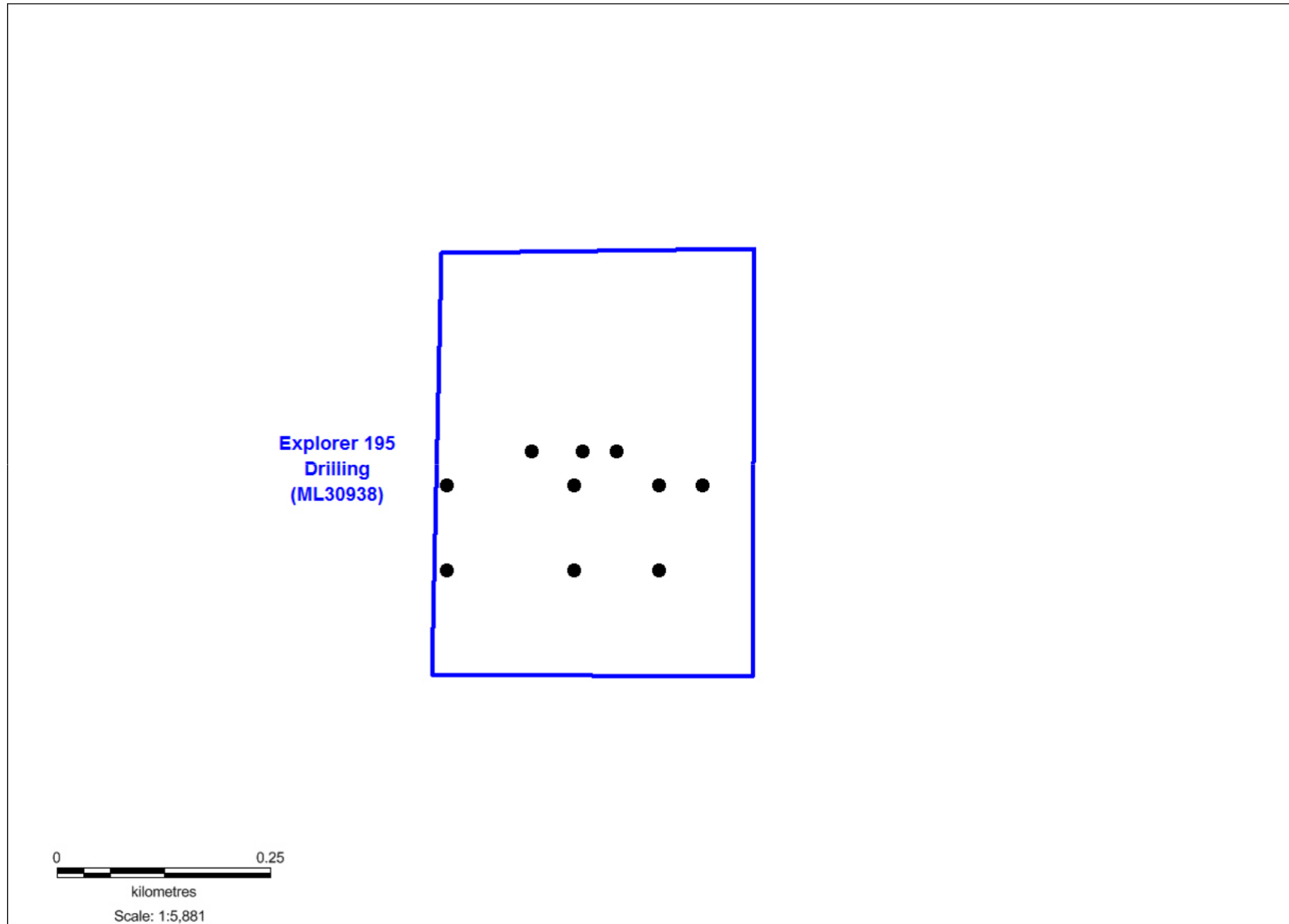


Figure 10b: Proposed drilling at 'Explorer 195'.

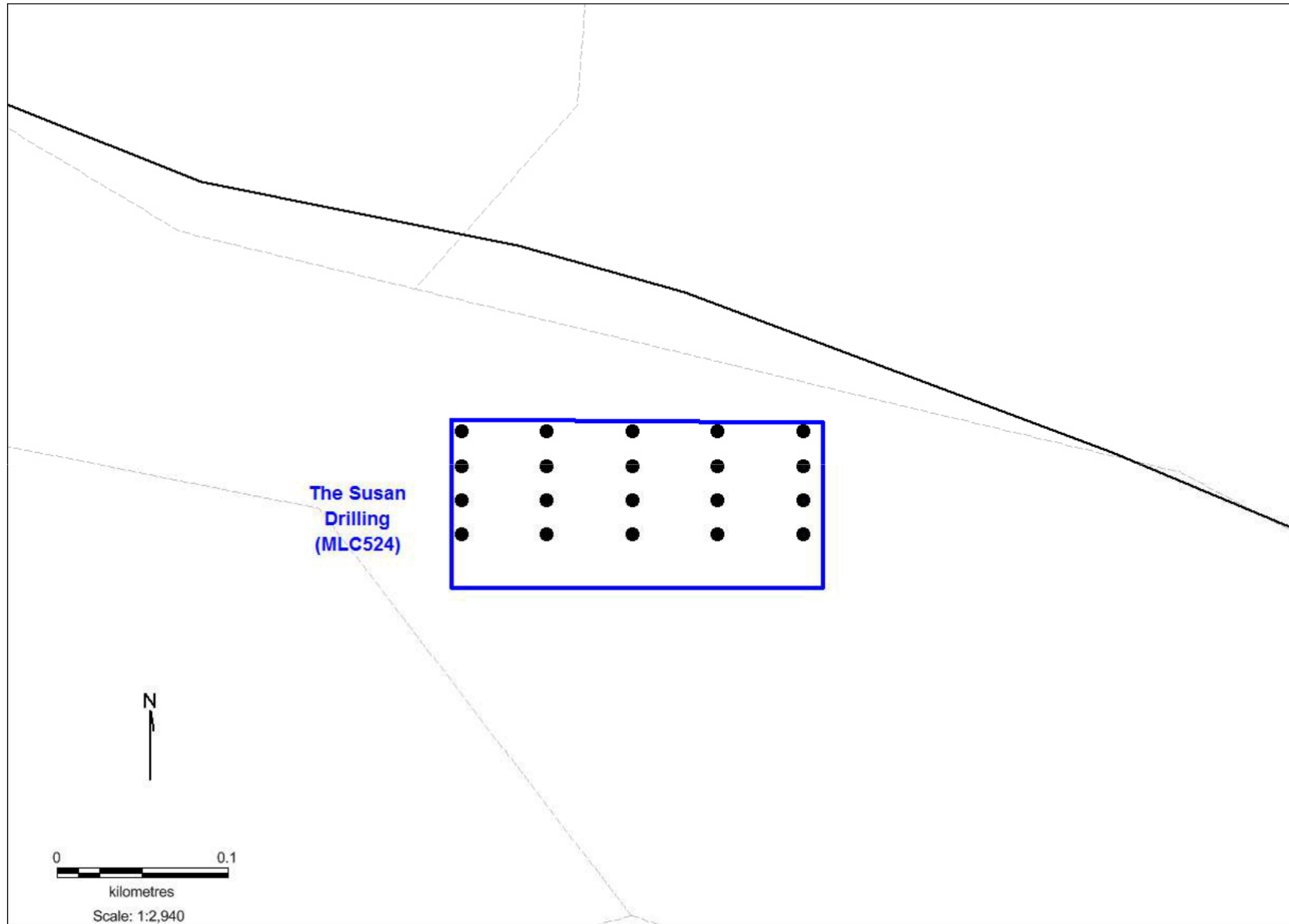


Figure 10c: Proposed drilling at 'The Susan'.

Table 4: EPA MMP Drill Collar Numbers for the 2018 field season.

Target Name	Tenement(s)	RAB Holes #	RAB (m)	RC Holes #	RC (m)	RC Pre Colls #	RC Pre Colls (m)	DDH Holes #	DDH (m)	Comments
Mauretania Trend Area	EL 28761			6	1,200					Proposed
Black Snake	MLC53			30	1,800					Proposed
Golden Kangaroo East	MLC576			35	2,100					Proposed
Three-Thirty	MLC32			25	1,500					Proposed
The Susan	MLC524			20	1,200					Proposed
Explorer 195	ML30938			10	1,440					
Regional West Area	EL's 10406 & 9403									Proposed
Regional East Area	EL 28618 & ML 30716									Proposed
Target Name	Tenement(s)	RAB Holes #	RAB (m)	RC Holes #	RC (m)	RC Pre Colls (m)	DDH Holes #	DDH (m)	Comments	
	Total			126	9,240					Proposed

The total of 129 holes derived by; the addition of 126 proposed RC holes and 3 RC holes (although the rehabilitation has been completed we have yet to take photos for future monitoring, and to include in this MMP, therefore they will remain as part of the security calculation) will be used in the security calculation, attached as Appendix 13.

4.0 CURRENT PROJECT SITE CONDITIONS

GEOLOGY

A map depicting the project area and land type is attached as figure 1, figure 7 details the proposed target areas and figure 9 details relevant access tracks.

The EPA covers a region of the Tennant Creek Province and includes deformed lower-greenschist facies flysch sequence (Warramunga Formation) intruded by syn-orogenic granite and granodiorite as well as stratabound felsic porphyry. This sequence is overlain by silicic volcanics and volcaniclastics (Flynn Subgroup) and intruded by late orogenic granite, porphyry and lamprophyre. The Warramunga Formation comprises greywacke, siltstone, and shale with interbedded felsic volcanics. Crustal melting resulted in the formation of dry, I-type granodiorite melts and granitic differentiates (Tennant Creek Supersuite), which intruded the Warramunga Formation and lower parts of the Flynn Subgroup during and subsequent to the Barramundi Orogeny. Deformation of the Warramunga Formation produced tight upright folds with a pervasive sub-vertical east west slaty cleavage accompanied by lower greenschist facies metamorphism. Deposition of the volcanosedimentary Flynn Subgroup more or less coincided with the plutonic events.

Progressive dextral shearing resulted in large-scale east trending open folds, as defined by the stratabound porphyries. Disharmonic folds, angular folds and plunging doubly peaking anticlines with a weak sub-vertical crenulations cleavage developed within the Warramunga Formation. North West trending open folds of disharmonic style were generated within the Flynn Subgroup. The youngest igneous events in the Tennant Creek Province were intrusion of the Warrego and Gosse River East granites, as well as lamprophyre dykes and sills.

The EPA is largely covered by Quaternary sands and gravels in relict fluvial systems, active channels, floodplains and quartz-rich dissected colluvial fan deposits.

Outcrop within the EPA is limited to ridges and these comprise scattered outcrops of Paleoproterozoic Warramunga Formation and Flynn Sub-group/ Tomkinson Creek Sub-group (Ooradidgee Group).

The EPA includes a number of significant gold-copper-bismuth deposits, including Nobles Nob, Juno, Peko, Eldorado and Argo.

Vegetation is mostly sparse, but includes varying combinations of spinifex grasses and small eucalypts, Acacia species and a range of other native vegetation types. The vegetation can be classed as semi-arid savannah, and appears typical of a much wider surrounding region.

HYDROLOGY

Numerous water bores for cattle or other uses have been identified by Emmerson in the EPA, refer to figure 11. Water required for the proposed drilling will be trucked to the drill sites on a needs basis. Emmerson does not intend to utilise water from the landowners, Emmerson pays for the water from the contractor, 'Baber Hire' who sources the water through their business.

Examination of previous drilling in the EPA suggests the standing water table in most of the Project Area will be between 40m and 70m below the land surface, and that the groundwater will not be suitable for drinking water. Any drilling that intersects aquifers will be rehabilitated in accordance with DPIR guidelines – Construction and Rehabilitation of Exploration Drill Sites.

Drainage within the EPA is very limited and only covers the very most northern portion of the Project Area. The drainage here drains from east to the west, as shown in figure 12.

Topography is very flat with limited small ridges scattered throughout the Project Area, due to the cultural and heritage significance of these ridges exploration is often limited to the flat surrounding ground, therefore pad construction on these ridges will not be necessary.

FLORA AND FAUNA

Due to the historical nature of Mineral Exploration and Mining in the Tennant Creek Region, Emmerson has had access and been able to incorporate studies and surveys conducted by previous exploration and mining companies to identify the presence of any endangered Flora and Fauna species within Emmerson's Project Areas.

Further to this Emmerson has conducted an EPBC Protected Matters Report, attached as appendix 9. The EPBC Protected Matters Report has identified;

Threatened Species, including;

Amytornis dorotheae – Carpentarian Grasswren –
Endangered Calidris ferruginea – Curlew Sandpiper – Critically
Endangered Erythrotriorchis radiates – Red Goshawk –
Vulnerable Erythrura gouldiae – Gouldian Finch – Endangered
Falcunculus frontatus whitei – Crested Shrike-tit (northern) – Vulnerable
Grantiellaa Picta – Painted Honey Eater – Vulnerable
Numenius madagascariensis – Eastern Curlew – Critically Endangered
Pedionomus torquatus – Plains wanderer – Critically Endangered
Pezoporus occidentalis – Endangered
Polytelis alexandrae – Night Parrot – Vulnerable
Rostratula australis – Australian Painted Snipe – Endangered
Tyto novaehollandiae kimberli – Masked Owl – Vulnerable
Dasyurus hallucatus – Northern Quoll – Endangered
Macroderma gigas – Ghost Bat – Vulnerable
Macrotis iagotis – Greater Bilby – Vulnerable
Petrogale lateralis – Black footed Rock Wallby – Vulnerable
Pseudantechinus mimulus – Carpentaria Antechinus – Vulnerable
Saccolaiums saccolaiums nundicluniatus – Bare-rumped Sheath tailed Bat –
Vulnerable Zyzomys pedunculatus – Central Rock Rat – Endangered
Eleocharis papillosa – Dwarf Desert Spike-rush – Vulnerable
Acanthophis hawkei – Plains Death Adder – Vulnerable

Migratory Species, including;

Cecropis daurica – Red Rumped Swallow
Cuculus optatus – Oriental Cuckoo
Hirundo rustica – Barn Swallow
Motacilla cinerea – Grey Wagtail
Motacilla flava – Yellow Wagtail
Calidris ferruginea – Curlew Sandpiper
Charadrius veredus – Oriental Plover
Glareola maldivarum – Oriental Pranticole
Numenius madagascariensis – Eastern Curlew
Pandion haliaetus – Osprey
Tringa nebularia – Common Greenshank

Weeds, including:

Prickly Acacia
Buffel Grass
Cotton-leaf Jatropha
Jerusalem Thorn
Bitter Weed (Parthenium Weed)
Mesquite
Athel Pine

During Emmerson's 10 years of exploration in the Tennant Creek Mineral Field hasn't identified any of the rare and endangered species of animals, birds or plants that may be affected by the exploration activities as outlined in the Protected Matters Report in the subject areas for exploration activities. To further ensure the protection of these detailed species, that potentially may occur within the area Emmerson has engaged Ecoz in 2017 to review the 2017 Protected Matters Report and provided expert advice on, for example, the potential to encounter any detailed endangered species, or the requirement to implement particular systems and/or procedures for Emmerson to ensure that the environment is protected. The 2018 Protected Matters Report identifies the same threatened and migratory species as the 2017 report, therefore, the results of the 2017 review and assessment by Ecoz are still relevant and are attached as Appendix 17. The report identified that nine threatened species (all fauna) have potential to occur within the TCP area, of which three have a high or moderate likelihood of occurrence

– Grey Falcon (*Falco hypoleucos*), Brush-tailed Mulgara (*Dasyercus blythi*) and Greater Bilby (*Macrotis lagotis*). Risk of impact from exploration activities to Grey Falcon is considered low, as nesting habitat (tall trees along major drainages) is not expected to occur within the TCP, and if it is present, tall trees will not be cleared as part of proposed works. Impact to Brush-tailed Mulgara and Greater Bilby may occur if burrows are directly disturbed; therefore, field inspections would be required to confirm if risk level to these species. The remaining six species (refer to Table 3.1 in Appendix 17) are considered to have a low likelihood of occurrence, and no specific risk mitigation measures are considered necessary (as general environmental management measures would be suffice).

Twelve listed weed species are known to occur in the region surrounding the project area – Athel Pine, Bellyache Bush, Caltrop, Coffee Senna, Hyptis, Khaki Weed, Mossman River Grass, Parkinsonia, Parthenium, Prickly Acacia, Rubber Bush and Star Burr. Various other (non-declared) introduced flora species also occur in the region, such as Buffel Grass and Couch Grass. It is likely that there will be some existing weed infestations present within the exploration footprint, in particular in previously disturbed areas and along drainage lines. Exploration activities have potential to introduce new weeds to the area (on equipment and machinery) and/or spread and increase the densities of existing weed infestations.

Pest animals are likely to occur in the project area. Any increase in pest numbers could impact threatened species populations (and other native fauna). In the case of the TCP area, the greatest risk is likely to be associated with any increase in Feral Cats and Foxes, which subsequently could increase predation of small mammals (and other native fauna, including threatened species).

When Emmerson has discovered an economic deposit then it will further engage with Ecoz to conduct appropriate baseline flora and fauna surveys over the relevant areas resulting in the populating of a Flora and Fauna Register and the identification and implementation of management programs for any endangered or threatened species and to provide an up to date assessment and baseline. Emmerson's proposed ground disturbing work is of a limited and low impact nature in this MMP.

The EPA is subject to sporadic wildfires.

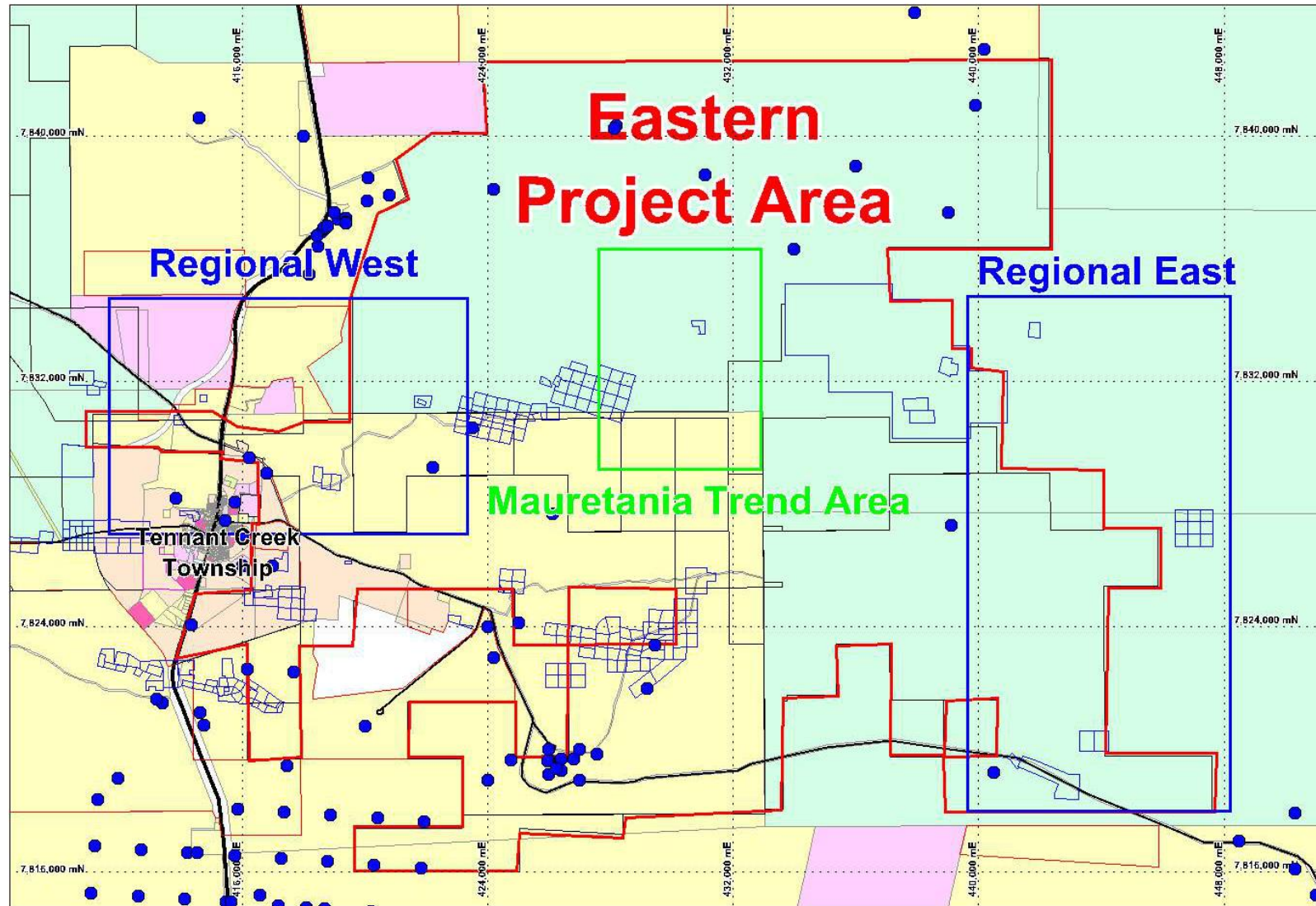


Figure 11: Water Bore Locations (blue dots)

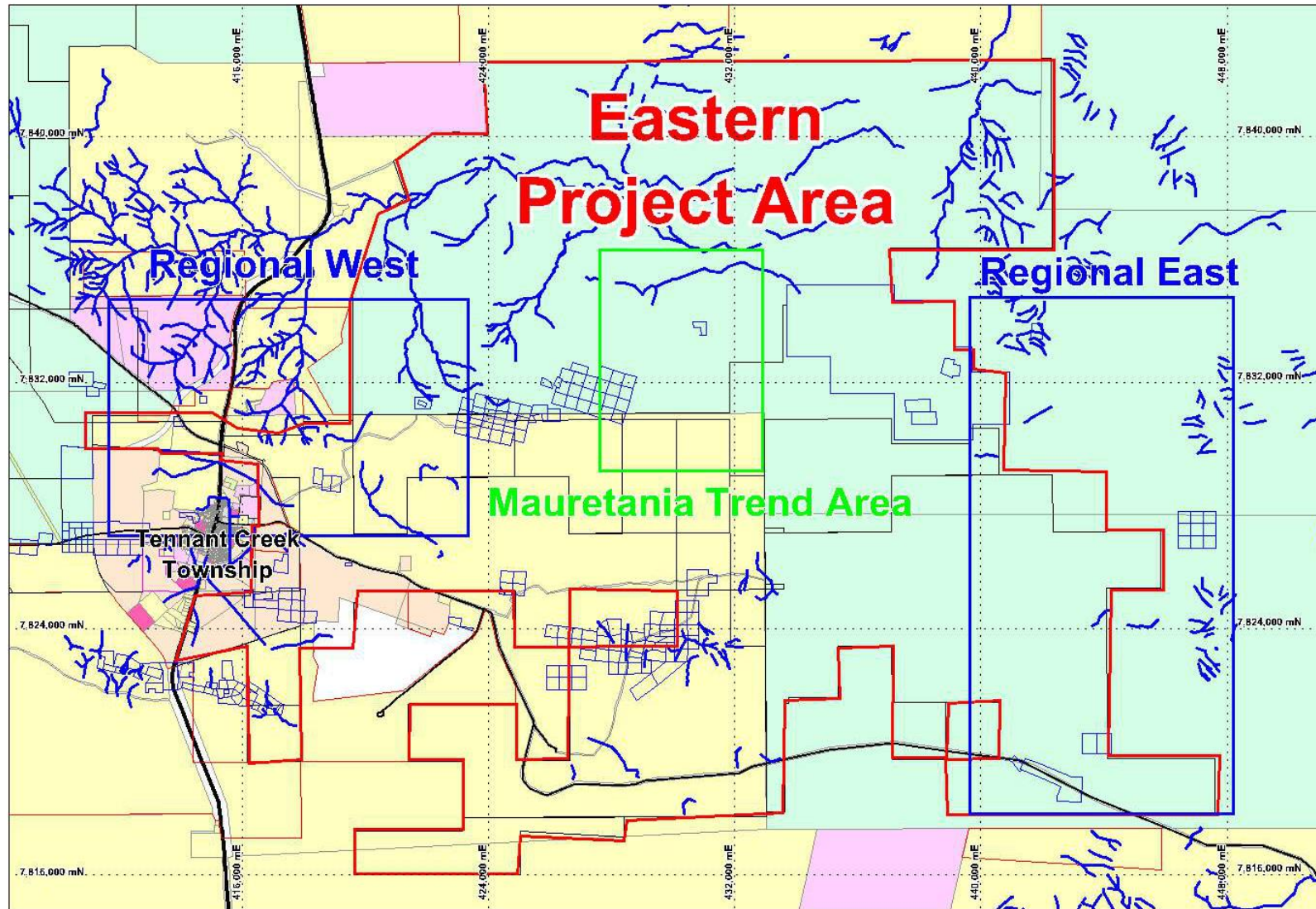


Figure 12: EPA Drainage

CURRENT LAND USE

The EPA is on Aboriginal Freehold land and Pastoral Land Managed by Tennant Creek Station. As far as Emmerson is aware, the principal land use is for cattle-raising. Figure 1 details the land type and tenure.

HISTORICAL, ABORIGINAL, HERITAGE SITES

Emmerson utilises an MapInfo layer containing all Aboriginal Areas Protection Authority (AAPA) registered sacred sites and also a MapInfo layer containing all Central Land Council (CLC) registered sacred sites to cross reference proposed areas of exploration activities with registered sites. Further to this Emmerson also consults with the CLC and traditional owners and has on ground heritage surveys conducted prior to any undertaking of exploration activities, as per the Sacred Sites, Aboriginal Land Rights and Native Title Act's in areas previously not explored. Figure 9 displays the registered AAPA and CLC sacred sites in the EPA, and those related to the proposed works. During the 2017 field season no sacred site clearances were conducted.

Clearance Area	Date	CLC Reference No.
N/A		

Table 5: Emmerson CLC Clearance Certificates

5.0 ENVIRONMENTAL MANAGEMENT SYSTEM / PLAN

Emmerson encourages the commitment to the highest level of compliance and importance to all operations, staff and contractors in relation to meeting all statutory obligations and regulations for the protection and management of the environment while conducting exploration activities.

Emmerson outlines its systems, policies and procedures in its Environmental Manual to ensure the protection of the environment. Emmerson is currently restructuring the Environmental Manual aimed at reducing the size of the document, ensuring that all procedures are fit for purpose, suitable to the current size of the company and the number of staff to resource the requirements, to stream line the document and ensure that it operates more efficiently and that the environment can be protected. The manual will be made available on request along with an update on the progress of the restructure and review. Emmerson will regularly or when appropriate, have an independent body assess the manual to ensure that Emmerson conducts and complies with all regulations and statutory requirements in its protection and management of the environment during exploration activities.

Emmerson has also implemented an Environment Policy Statement which is a simple 1 page document for employees and contractors to adhere too and conduct work by, in conjunction with the Environmental Manual, and is attached as Appendix 10.

5.1 ENVIRONMENTAL POLICY AND RESPONSIBILITIES

As detailed in the Environmental Manual and the Environmental Policy, Emmerson will:

- Establish appropriate industry practice and HS&E standards for its operations.
- Actively assess and control hazards in the workplace.
- Train its employees in the principles of working to protect the environment.
- Maintain employee involvement in environmental matters.
- Communicate with its employees and respond in a timely manner to their environmental concerns.
- Make a commitment to the protection of the environment and comply with all laws, statutory and non-statutory requirements.

Emmerson employees are encouraged to share responsibility for environmental matters and:

- Work in a manner to minimise the impact of their activities on the environment.
- Promptly report all incidents, hazards, unsafe practices or conditions in the workplace.
- Actively participate in the support and promotion of environmental responsibility in the workplace.

5.2 STATUTORY REQUIREMENTS

- Aboriginal and Torres Strait Islander Heritage Act
- Aboriginal Land Rights (NT) Act
- Australasia Railway Act
- Bushfires Act
- Code of Practice for Safe Transport of Radioactive Materials 2001
- Environment Protection and Biodiversity Conservation Act
- Environmental Assessment Act
- Environmental Penalties and Offences Act
- Heritage Act
- Native Title Act
- NT Aboriginal Lands Act
- NT Aboriginal Sacred Sites Act
- NT Lands Act
- NT Mineral Titles Act
- NT Mining Management Act
- NT Mining Management Regulations
- Petroleum Act
- Plant Health Act
- Reporting Requirements such as those for; employment/injury and safety statistics; frequency of water quality reporting lease conditions
- Soil Conservation and Utilisation Act
- Territory Parks and Wildlife Conservation Act
- Waste Management and Pollution Control Act
- Water Act
- Weeds Management Act
- Work Health & Safety (National Uniform Legislation) Act

All other relevant Statutory Legislation will be strictly adhered to.

5.3NON-STATUTORY REQUIREMENTS

- “Indigenous Land Use Agreement (ILUA)” between Giants Reef Mining Limited and the Central Land Council.
- “Wildhorse II Agreement (WLDHII)” between Giants Reef Exploration Pty Ltd and Santexco Pty Ltd (both wholly owned subsidiaries of Emmerson Resources Ltd) and the Central Land Council.
- “EL’s 26787, 27408, 27537 & 27538 Agreement ” between Giants Reef Exploration Pty Ltd (a wholly owned subsidiary of Emmerson Resources Ltd) and Emmerson Resources Ltd and the Central Land Council.
- “Pre-existing Tenements Agreement” between Normandy Tennant Creek Pty Ltd (now Santexco Pty Ltd, a wholly-owned subsidiary of Emmerson Resources Ltd) and the Central Land Council.
- NT Mineral Council Code of Conduct.

5.4INDUCTION AND TRAINING

All personnel, including contractors, undergo Emmerson’s company Site Induction prior to any exploration activities. Issues detailed in the Site Induction include site safety equipment, evacuation procedures, conduct rules, personal safety instructions, cultural and environmental awareness and

systems, safety policies, obligation of care, personal protective equipment and safe work procedures. The environmental awareness and systems section of the induction includes;

- Clearing of Roads and Tracks and use of Burrow Pits
- Drill hole sampling and capping
- Drilling Operations
- Environmental Monitoring
- Hydrocarbon and chemical management
- Reconnaissance Exploration
- Rehabilitation Procedures and Monitoring
- Topsoil Management and Monitoring
- Waste Management and Monitoring
- Vegetation Management and Monitoring
- Water Management and Monitoring
- Incident Reporting
- Accountabilities Flow Charts
- Legal Requirements
- Environmental Auditing

All staff, contractors and visitors who undergo the induction are recorded in the Induction register.

5.5 IDENTIFICATION OF ENVIRONMENTAL ASPECTS AND IMPACTS

Below is the Risk Matrix Key for all identified environmental risks.

Likelihood	Consequence		
	Low	Medium	High
	Little or no Impact	Medium term -ve impact	Irreversible or long term -ve impact
High	4	7	9
>75% chance event will occur in life of plan			
Medium	2	5	8
25% - 75% chance event will occur in life of plan			
Low	1	3	6
<25% chance event will occur in life of plan			

	Critical Risk
	High Risk
	Moderate Risk
	Low Risk

OPERATION	HAZARD	RISK RATING				REFINED RISK (after Mitigation)	Mitigation Process
		(9)-Critical	8)-(6)RiskHigh	RiskModerate 5)-(3	RiskLow 2)-(1		
Driving	Spread of Weeds			5		3	Removal of Weeds in the field, wash down in yard
	Spread of Pests			3		2	Removal of any identified pests immediately, on location
	Animal Hazards				2	1	Policy - Daylight Driving Only, Driving to Road Conditions
Earthworks / Clearing / Rehabilitation	Loss of Native Flora			3		2	Minimize areas to be cleared, use existing tracks where possible
	Loss of Native Fauna			3		2	Minimize areas to be cleared, use existing tracks where possible
	Erosion			3		2	Clearing and rehabilitation commences as close to operational timeframes as possible, prior to the wet season
	Dust Hazard				2	1	Water, PPE, working upwind
Refuelling Operations	Hydrocarbon Spills			5		2	Have appropriate spill kit and personal cleaning kit available
	Contamination Risk				2	1	Environmental Policy, induction, Incident reporting
General Operations	Noise Hazard			3		2	Fitting noise restrictors, PPE, Induction, SOPs, Polices, Monitoring
	Dust Hazard				2	1	Water as dampener, PPE, working upwind, Inductions, polices, SOPs
Drill Rig Operations	Hydrocarbon Spills			5		2	Have appropriate spill kit and personal cleaning kit available
	Noise Hazard			3		2	Fitting noise restrictors, PPE, Induction, SOPs, Polices, Monitoring
	Dust Hazard				2	1	Water as dampener, PPE, working upwind, Inductions, polices, SOPs
	Contamination Risk				2	1	Environmental Policy, induction, Incident reporting
Wildfire	Endangering Flora & Fauna			3		1	Operate safely and minimise the risk of starting a fire that may lead to a wildfire.
Drill Hole Capping	Endangering Fauna			3		1	Ensure drill holes are capped ASAP to ensure limited time for fauna to be endangered
Reconnaissance Exploration	Noise Hazard			3		2	Fitting noise restrictors, PPE, Induction, SOPs, Polices, Monitoring

	Dust Hazard	Red	Orange	Yellow	Green 2	Green 1	Water as dampener, PPE, working upwind, Inductions, polices, SOPs
	Endangering Flora & Fauna	Red	Orange	Yellow	Green 2	Green 1	Operate with the minimal impact possible
Water	Contamination Risk	Red	Orange	Yellow	Green 2	Green 1	Environmental Policy, induction, Incident reporting
	Aquifer Leakage	Red	Orange	Yellow 3	Green 2	Green 1	Rehabilitation of the hole as per DPIR guidelines

5.6 EMERGENCY PROCEDURES AND INCIDENT REPORTING

No environmental incidents or accidents were encountered during the previous twelve months.

If an environmental hazard or incident occurs that cannot be dealt with immediately on site by following the procedures and guidelines developed in Emmerson’s EMS detailed in the Environmental Manual, the relevant authorities in Tennant Creek will be notified (e.g., Bushfires Council). Any environmental incident will be reported immediately, as per DPIR requirements.

Emergencies will be dealt with on an individual case basis, and the response will be as outlined in the Environmental Incident and Non-Compliance Reporting section of Emmerson’s Environmental Manual, and also as per the DPIR Incident Response Guideline.

5.7 ENVIRONMENTAL AUDITS AND INSPECTIONS

Emmerson inspects all drill sites pre and post drilling and also during activities to routinely monitor progress and assess the environmental compliance to identify and address any potential issues early. When rehabilitation has been completed DPIR is advised at the time of the MMP renewal application and the rehabilitated sites are available for any audit and check for compliance.

Emmerson will routinely conduct further visits to the rehabilitated site when the chance arises to monitor the progress of the rehabilitation and ensure that the rehabilitation is progressing as expected, should any matters arise from these further visits then remedial action is taken, as per the standard procedures for rehabilitation.

5.8 ENVIRONMENTAL PERFORMANCE PROGRAMS AND REPORTING

WATER MANAGEMENT

If significant flows of water are encountered during any drilling activities the overflow will be managed by diversion into specially constructed sumps. The sumps are constructed with a ramp egress at one end to allow fauna/livestock to exit should that be required. The CLC and NT Power & Water will be notified immediately.

Should an aquifers be encountered during drilling then the drill holes will be rehabilitated as per sections 3.2.2 – 3.2.4 of DPIR’s ‘Construction and Rehabilitation of Exploration Drill Sites Guideline. This system is outlined in the Environmental Manual (Environmental Management System 23).

No significant water flows were encountered.

BIOLOGICAL MANAGEMENT

Emmerson has guidelines for all employees and contractors to follow to ensure protection of the environment, detailed in Emmerson’s Environmental Manual (Vegetation and Weed Management

Procedure – Environmental Management System 22). It also details the weeds that may be encountered in the field so as employees and contractors can report any discovered weeds for remediation.

All Emmerson employees and contractors are directed to stay to the existing tracks and weeds are removed from vehicles in the field and the vehicles are washed down in the wash bay at Emmerson's Tennant Creek yard.

WASTE MANAGEMENT

The current waste management procedure is to bring rubbish back from the drill sites to Tennant Creek on a daily basis and dispose of it at the town dump. This system is outlined in the Environmental Manual (Environmental Management System 20).

NOISE AND AIR QUALITY MANAGEMENT

Noise is controlled by suitable mufflers and sound-absorbing pads on drilling machinery such as air compressors and large diesel engines.

Suppression of dust produced from the drill rig is achieved by the use of modern design cyclones or water injection. Dust from vehicles using dusty tracks is not expected to be a major problem as the period of use of these tracks will only be of short duration.

REPORTING

While contracting to Emmerson, all Contractors will comply with the Company's Environmental Manual and the HS&E Policy. Therefore the Contractors environmental performance will be included in the Company's annual report. Environmental Performance Reporting (Form as per DPIR MMP Advisory Note 2008);

- Were the previous year's Exploration Activities meeting the Environmental Objectives & Targets?

N/A – No exploration activities were conducted

- Was progress made towards achieving revegetation and closure objectives during the previous year?

YES – All sites visited during the field season displayed continuing regrowth, the amount of regrowth varied significantly depending on the maturity of the rehabilitation.

- Were any reviews (e.g. audits) conducted through the year?

YES

Emmerson conducted sporadic monitoring as opportunities arose during the year. When Emmerson employees were travelling past historical sites the area was overviewed for any obvious rehabilitation non-compliances, rehabilitation regrowth was observed, with any negative observations used for remediation actions. During these sporadic visits no remediation activities were actioned or required.

- Was there any Environmental Monitoring (e.g. noise, dust) completed during the year? YES – As detailed above, on an opportunity basis;

- Are there any waste management issues that have arisen during the previous year?

NO

6.0 EXPLORATION REHABILITATION

During 2017 Emmerson conducted rehabilitation of the 3 outstanding RC drill holes located at the Black Snake prospect. As photos have yet to be taken these holes will remain part of the security calculation.

For all proposed RC programs and future generated RC programs to proceed, minor drill pad clearing may be required. This minor clearing will be completed by ensuring topsoil and seed stock is collected in a top soil dump at the edge of each drill pad. Minor earthworks may be required on the upgrading of existing access tracks.

After the project is deemed complete it is planned that all drill samples will be buried, as per the agreement with the owners and operators of Tennant Creek Station (Perpetual Pastoral Lease 1142) prior to the onset of the 'Wet Season' usually within a 6 month period. This agreement is attached as appendix 12. All sample bags are cut open and the spoil is buried, the sample bag is then disposed of at the Tennant Creek Rubbish Dump.

All rubbish will be removed from the sites and disposed of at the Tennant Creek Town Rubbish Dump. Drillholes will be plugged and covered in the approved manner. The approved manner for drill hole rehabilitation is as described below, any drilling that intersects aquifers will be rehabilitated in accordance with DPIP guidelines – Construction and Rehabilitation of Exploration Drill Sites;

- The collar is plugged with a cement hole plug
- This cement hole plug contains a metal wire which protrudes from the top of the plug as small 'handle' like object
- The cement hole plug is wedged as tight as possible into the PVC collar
- The collar is then backfilled by replacing and dirt spoil from around the collar into the void and padded down
- The collar and plug are then back filled over, so no protruding evidence of the hole is visible, also no hole peg remains at the site
- The hole is later located by using a metal detector, which locates the metal wire in the cement hole plug
- The hole is plugged and backfilled to prevent the entrapment of small fauna species

TOPSOIL MANAGEMENT

Any piled-up topsoil heaps resulting from clearing the drill pads will be pulled back over the pads after the completion of drilling and prior to the onset of the 'wet season', and is described in detail in Emmerson's Environmental Manual EMS 19.

REVEGETATION METHODS

Emmerson has found from Giants Reef's and Normandy's years of experience in the Tennant Creek region that lightly-cleared drill pads and access tracks will revegetate naturally over a few years, to the point where they become almost indistinguishable from the surrounding undisturbed bush. Natural revegetation is initiated by ripping of compacted areas and pulling heaped topsoil and captured seed stock back over the cleared area prior to the onset of the NT seasonal rains.

6.1 COSTING OF CLOSURE ACTIVITIES

Emmerson has completed a security calculation form, obtained from the DPIR website, and has attached it as Appendix 13. As per section 3.2 Emmerson has proposed to drill approximately 126 drill holes in the EPA, and as stated in section 3.1 above there remains 3 holes that have been rehabilitated but will need to supply the photographic evidence before removing them from the security calculation, these 3 holes are from the 2016 approved Authorisation, therefore totalling 129 holes will be subject to this MMP and its security calculation.

Emmerson will lodge the security as cash.

In the case that following the execution, analysis and interpretation of the work programs listed in section 3.2, further work programs were submitted as addendums to the EPA MMP, generating drill hole numbers higher than initially proposed, then Emmerson would increase the security held to compensate for the increased exploration activities in the EPA through the submission of an addendum to this MMP.

6.2 PERFORMANCE OBJECTIVES

The performance objectives for the proposed drilling program at the EPA for 2018 remain the same as they did for 2017 and all previous years, and they are:

1. To complete all the drillholes by December 2018, and
2. To complete the rehabilitation work at each drill site within a six (6) month period after the completion of the program and prior to the onset of the 'Wet Season', where possible.

The person responsible for meeting these objectives is Ana Liza Cuison, Exploration Manager. A company structure flow chart is detailed in section 1.1 of this MMP.

The Application for an Authorisation is attached as Appendix 6.

I, Ana Liza Cuison, Exploration Manager for Emmerson Resources Ltd declare that to the best of my knowledge the information contained in this mining management plan is true and correct and commit to undertake the works detailed in this plan in accordance with all the relevant, Northern Territory and Commonwealth Government legislation.

Ana Liza Cuison
Exploration Manager
10 September 2018

Mr Paul Mason
Chief Financial Officer/Company Secretary
Emmerson Resources Limited
PO BOX 1056
WEST LEEDERVILLE WA 6901

Dear Mr Mason,

Re: Mining Management Plan Approval

I refer to your advice in relation to the Eastern Project Area submitted on 5 October 2020¹. Your advice relates to the previously approved Mining Management Plan (MMP) and requests relocation of two drill holes.

Your request has been considered and relocation of the drill holes is approved.

You are required to append the advice you provided and this approval to your public MMP.

Please contact Rojita Thapa on (08) 8999 5343 or via e-mail at mineral.info@nt.gov.au if you require any further information regarding this issue.

Yours sincerely



Roslyn Vulcano
Director Mining Operations
2 November 2020

¹ MDOC2020/05545

134°19' E

134°20' E

134°20' E

134°21' E

134°21' E

19°35' S

19°35' S

19°35' S

19°35' S

19°36' S

19°36' S

134°19' E

134°20' E

134°20' E

134°21' E

134°21' E

**EMMERSON RESOURCES LIMITED
EASTERN PROJECT AREA
AMENDED DRILLING LOCATION MAP**



DATE: 5/10/2020
DATUM: GDA94

LEGEND	
	ERM EL28761
	ERM ML Application
	ERM ML Granted
	

