

TERRITORY RESOURCES LTD

May 2017 to May 2018




PROGRESSIVE REMEDIATION REPORT

FOR

**RUM JUNGLE
EXPLORATION PROJECT**

Authorisation 0263-01

MLN1163, ELR125, ELR146

	Author	Reviewed by	Approved by
Date		19/05/2017	19/05/2017
Name	Linda Glass	John Milsom	John Milsom
Signature			

I John Milsom, General Manager of Territory 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 Local, Northern Territory and Commonwealth Government legislation.

SIGNATURE:



DATE: 19/05/2017

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AMENDMENTS TO 2016-2017 REMEDIATION REPORT

Section	Amendment
	Request from DPIR for kml or kmz files for all drill hole locations. Sent to DPIR by email 07/10/2016

1.0 OPERATOR DETAILS

Table 1: Rum Jungle Exploration Project Operator Details

OPERATOR NAME	Territory Resources Ltd
KEY CONTACT PERSON	Linda Glass
POSTAL ADDRESS	PO Box 3324 Palmerston NT 0830
STREET ADDRESS	103/5 McCourt Rd, Yarrowonga NT 0830
PHONE	0415 344 787 Linda Glass mobile (08) 8932 9442 Territory Resources Palmerston Office (08) 8911 1238 or (08) 8911 1270 (Frances Creek mine site office)
EMAIL	lglass@territoryresources.com.au

1.1 ORGANISATIONAL STRUCTURE

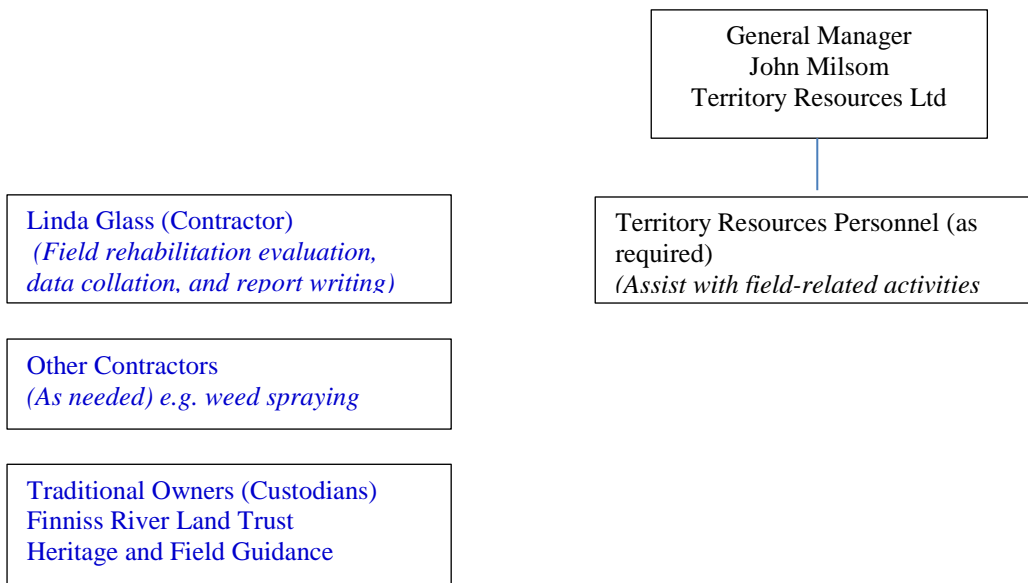


Figure 1: Organisational Structure Chart for Territory Resources personnel who are directly or indirectly involved with the Rum Jungle Project. Consultants and non-Territory Resources personnel are shown in blue

1.2 WORKFORCE

The breakdown of personnel and responsibilities are shown in Table 2.

Table 2: Personnel and Responsibilities

Department	Personnel	Role	Responsibility
Administration	John Milsom	General Management	Overall Management of Territory Resources Ltd and Territory Resources Ltd
External Contractor	Linda Glass	External Contractor	Field rehabilitation evaluation, data collation and report writing
External Contractor	NT Quality Hay & Contracting Pty Ltd	External Contractor	Weed spraying; fire break management

2.0 IDENTIFIED STAKEHOLDERS AND CONSULTATION

2.1 TITLE HOLDERS AND JOINT VENTURE PARTNERS

The Title Holders and Joint Venture Partner for tenements relating to the Territory Resources Ltd Rum Jungle Project are as follows:

ELR125: Northern Territories Resources Pty Ltd (100%)

ELR146: Northern Territories Resources Pty Ltd (100%)

MLN1163: Northern Territories Resources Pty Ltd (100%)

The tenements were previously held by Compass Resources Ltd (90%) and Guardian Resources Ltd (10%). The current status for tenure and the Title Holders for the Rum Jungle Exploration Project are listed in Section 3.0 Project Details. An Authorisation form and updated Nomination of Operator form is located in **Appendix I**.

2.2 PASTORAL LEASE OWNER/LAND TENURE

There are four freehold land holders affected by the proposed Exploration drilling works.

- Finnis River Aboriginal Land Trust
- NT Land Corporation (Sections 02954 and 02955 Hundred of Goyder)
- Sections 00982, 02943 and 02949 Hundred of Goyder
- Sections 00996 and 00997 Hundred of Goyder).

Territory Resources has a Land Access Agreement with one of the landowners, signed in 2012. The owners of the other freehold property however declined to enter into a formal agreement and will provide verbal permission for land access when required.

2.3 LAND CLAIMANTS (NATIVE TITLE)

The exploration project partly falls within the Finnis River Aboriginal Land Trust freehold land.. There are no active Native Title Applications over the area.

The NT Land Corporation approved earlier Territory Resources work programmes and several meetings with the Finnis River Aboriginal Land Trust have taken place, facilitated by Territory Resources Community and Heritage staff (both Archaeologists) and the Northern Land Council (NLC).

2.4 NEIGHBOURS AND COMMUNITIES

- Litchfield National Park

2.5 TENEMENT MANAGER

- Linda Glass (External Consultant)

2.6 GOVERNMENT DEPARTMENTS

- Department of Land Resource Management NT <http://riel.cdu.edu.au/people/organisation/departmen-land-resource-management-nt>
- Department of Lands, Planning and the Environment NT <https://dlpe.nt.gov.au/about>
- Department of Environment and Natural Resources NT (DENR) <https://denr.nt.gov.au/>
- Department of Primary Industry and Resources NT <https://dpir.nt.gov.au/>

3.0 PROJECT DETAILS

On the 25th May 2005, Territory Resources Pty Ltd was issued with Authorisation 0263-01 for the Rum Jungle Exploration Project. Details relating to the project are shown below in Table 3.

Table 3: Rum Jungle Exploration Project Details

PROJECT NAME	Rum Jungle Project – approximately 1.9 sq. km area over tenements ELR125, ELR146, MLN1163 (Authorisation 0263-01)
LOCATION	9km NW of Batchelor township, 61km SSE of Darwin.
SITE ACCESS	The project area is located ~90 km south along the Stuart Highway from Darwin, then ~10 km west to Batchelor township, Figure 2. From Batchelor head north ~6 km, then left along Litchfield Park for 700 m, then right (west) into Bevan Road for ~1.5 km. Turn north into Lithgow Road for 2.5 km, then right (east) along White Road (unsealed) to the project area.
AUTHORISATION NUMBER	Authorisation 0263-01
MINING INTEREST/S	Iron Ore
TITLE HOLDER/S	Northern Territories Resources Pty Ltd
TITLE STATUS	Active

Table 4: Tenement details for the Rum Jungle Exploration Project

Tenement	Title Holder	Grant Date	Expiry Date	Area (hectares)
ELR125	Northern Territories Resources Pty Ltd (100%)	23/08/1993	22/08/2018	1427.9
ELR146	Northern Territories Resources Pty Ltd (100%)	19/09/2001	18/09/2016	1008
MLN1163	Northern Territories Resources Pty Ltd (100%)	24/03/2005	23/03/2030	126.1

The Rum Jungle Project Area includes portions of ELR125, ELR146 and MLN1163 and was subject to an original agreement between Territory Resources Pty Ltd and previous tenement owners Compass Resources Ltd (90%) and Guardian Resources Ltd, (10%) whereby Territory Resources had the right, subject to certain royalty terms, to explore, mine and purchase iron ore from the title holders. In February 2017 a Deed of Novation was signed by Territory Resources Pty Ltd, Compass Resources Ltd, Guardian Resources Ltd and the present Title Holders, Northern Territories Resources Pty Ltd, whereby the latter company assumed the rights and obligations for the tenure of the previous Title Holders.

The Rum Jungle project area is located approximately 9 km NW of the township of Batchelor in the Rum Jungle Mineral Field and 61 km SSE of the city of Darwin in the Northern Territory, Figure 2. All weather road access is approximately 8 km via Rum Jungle Road; then ~700m along Litchfield Park Road, then ~ 1 km west along Bevan Road, north along Lithgow Road and finally east along White Road. Figure 3 and 4 show the area in more detail.

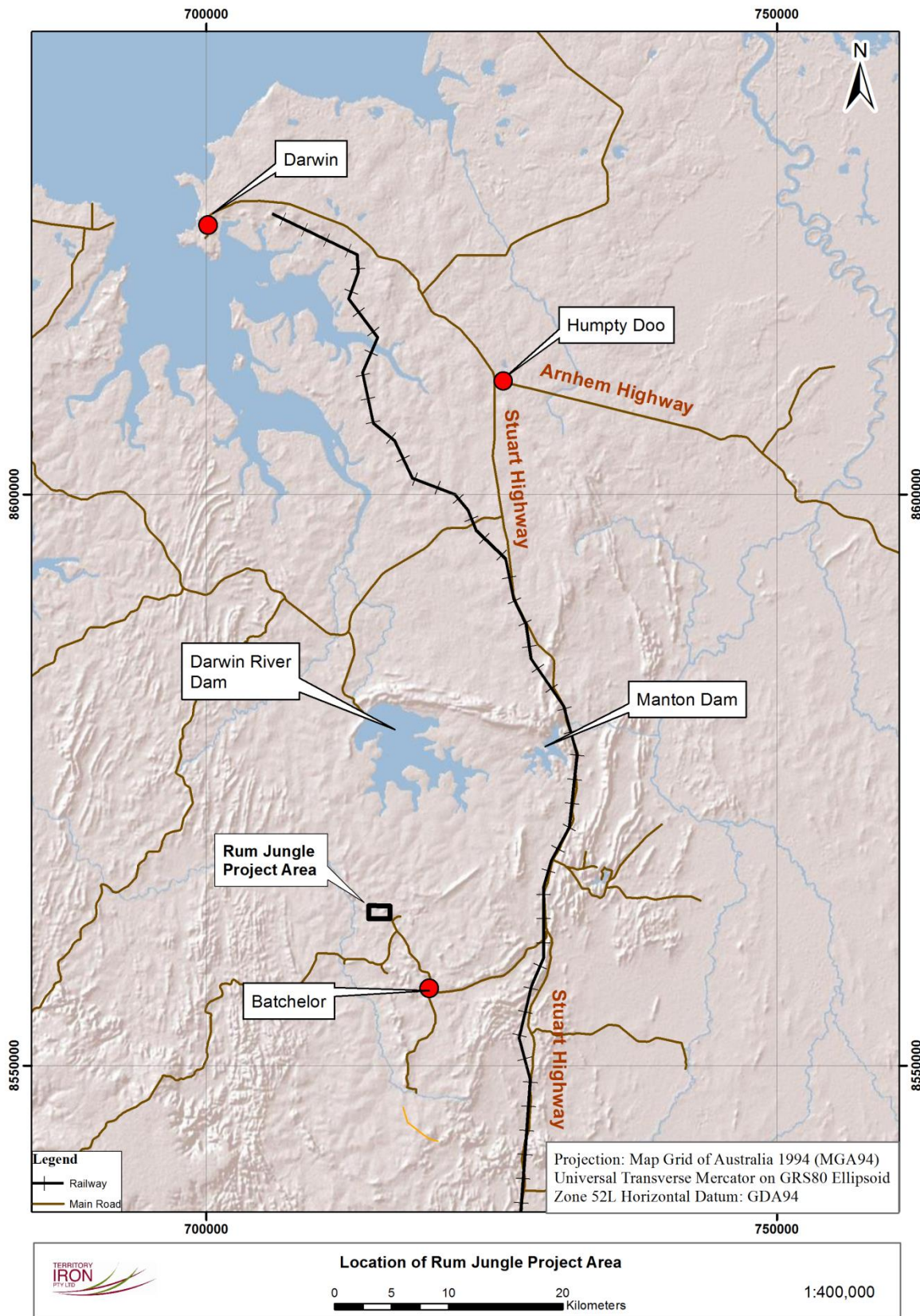


Figure 2: Location Map of Rum Jungle (Yarram) Project with ESRI world shaded relief defining background topographic elevation. The black rectangle highlights the project area and general location of ELR146. The beige polygons also show the location of adjacent Compass Resources and Guardian Resources tenure associated with the Rum Jungle Project

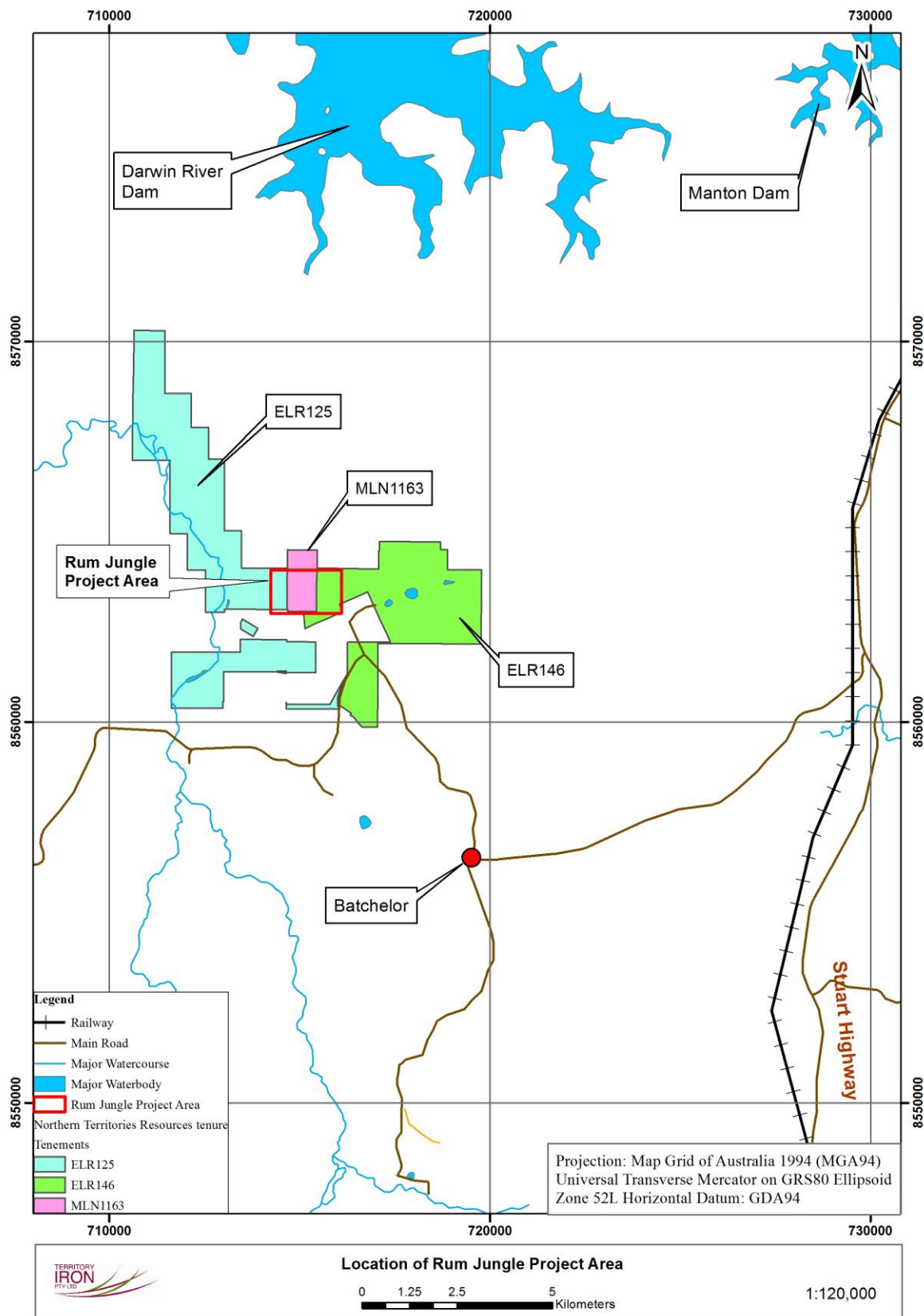


Figure 3: Location of Rum Jungle Project Area (red rectangle). The blue, pink and green polygons represent ELR125, MLN1163 and ELR146

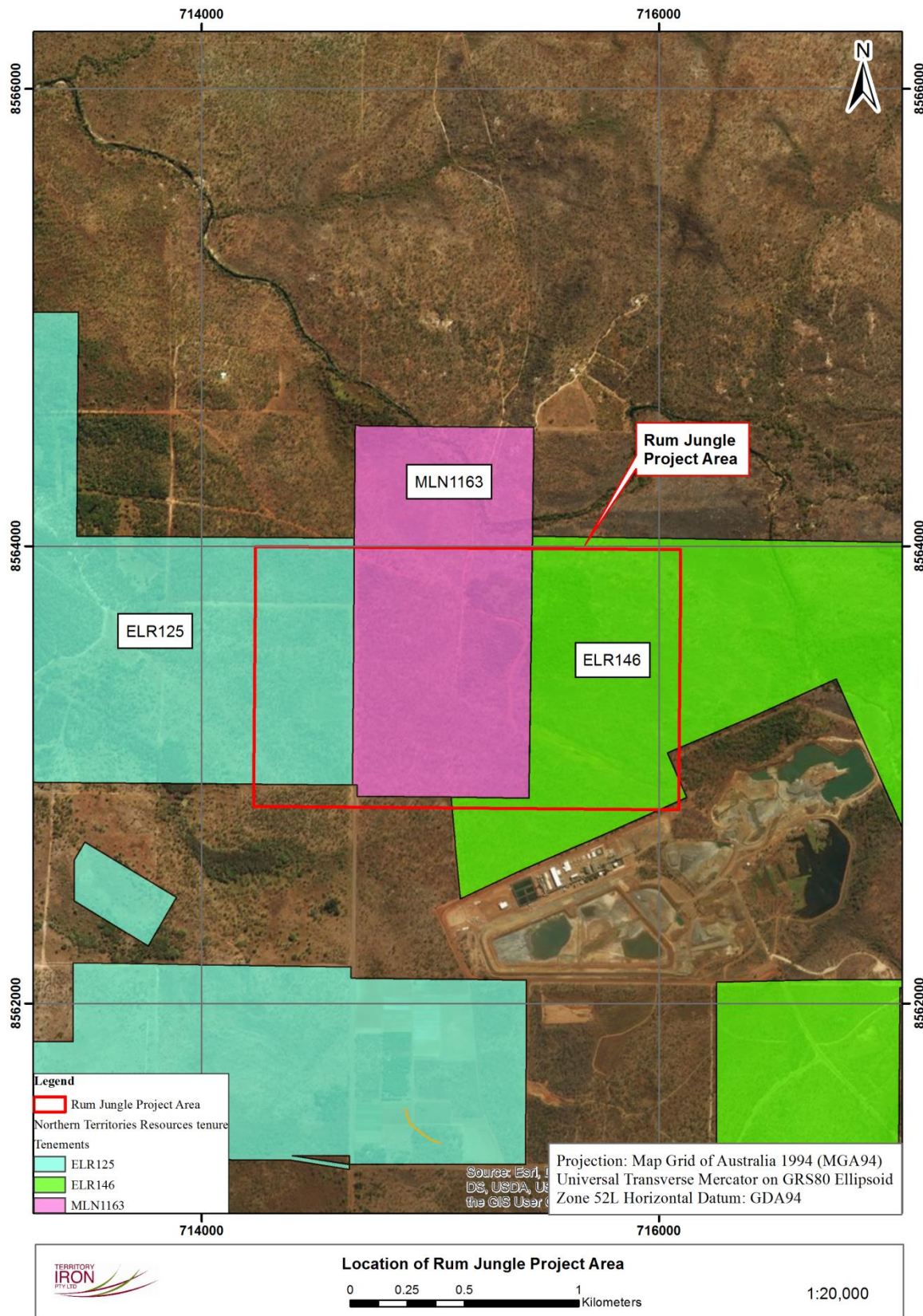


Figure 4: Detail of site location. The Rum Jungle Project Area is confined to the red rectangle. Browns polymetallic project can be seen to the south of the project area. ESRI world satellite imagery defines background relief

The project area partly overlies Aboriginal Freehold Land owned by the Finnis River Aboriginal Land Trust and partly overlies Freehold Land owned by stakeholders, Figures 5 and 6. Figure 7 shows the minor creek and stream locations and Figure 8 shows the relative topographic contours for the project area.

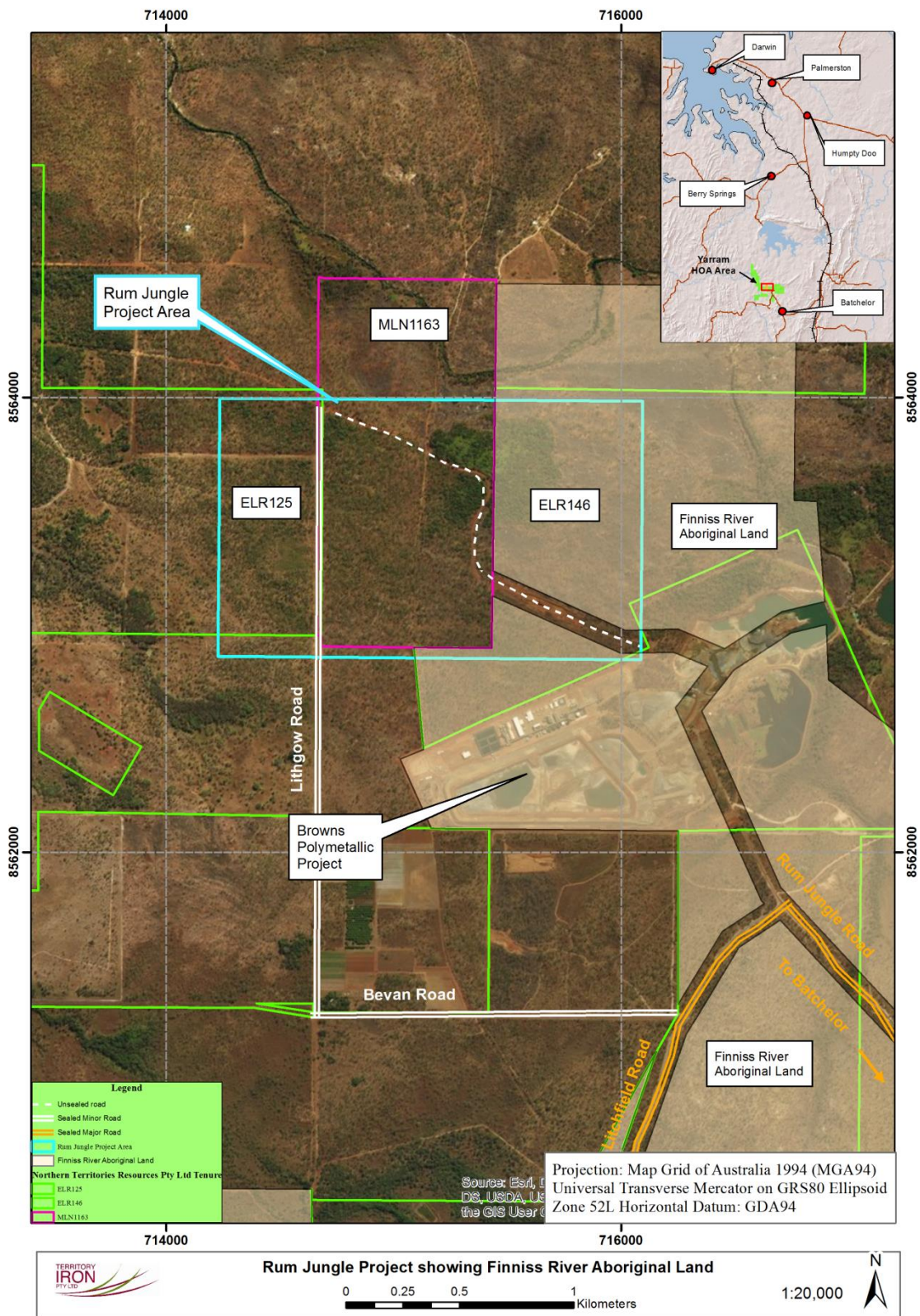


Figure 5: Diagram showing Finnis River Aboriginal Land (beige)

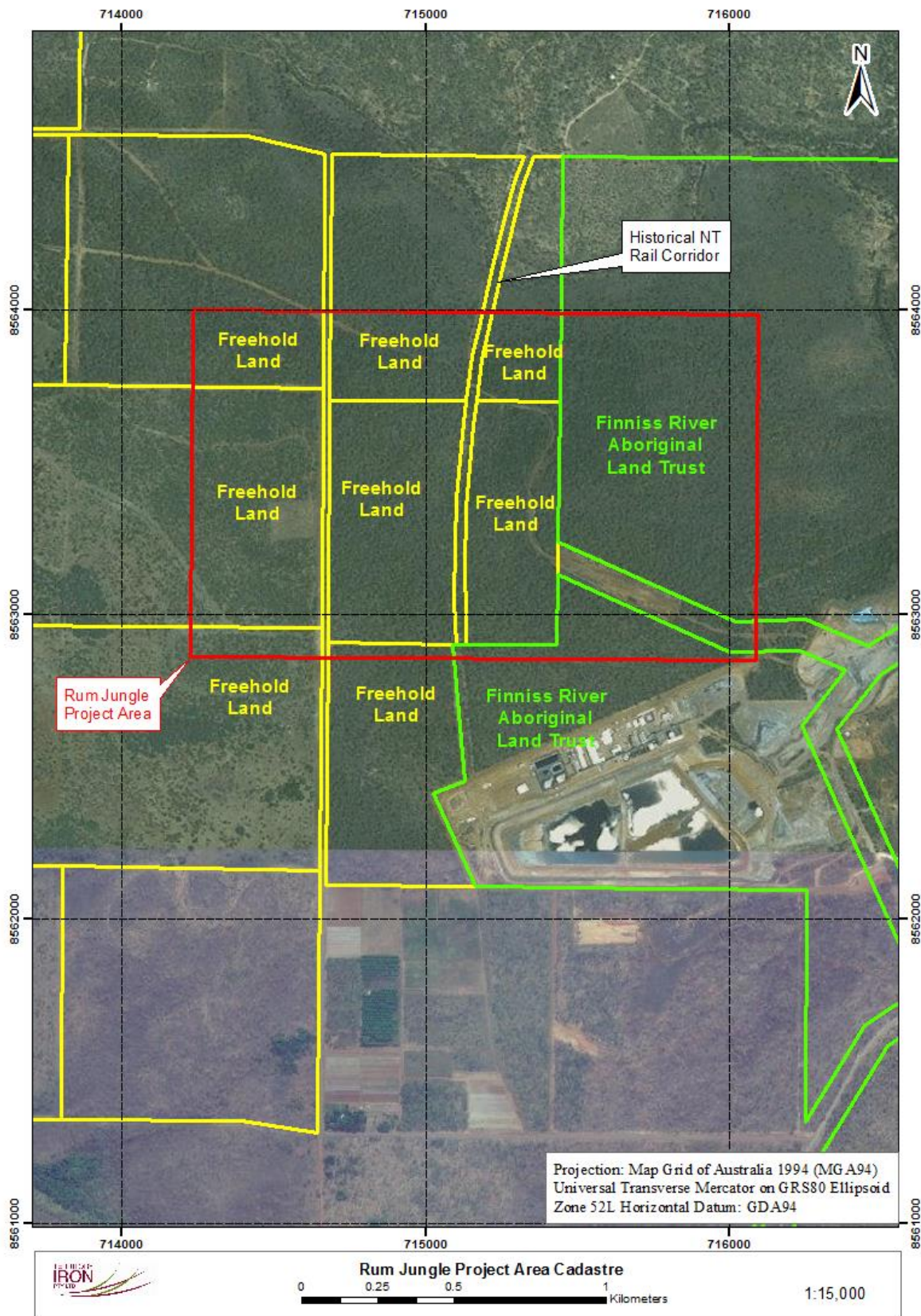


Figure 6: Rum Jungle Project Area Cadastre. ESRI world satellite imagery defines background relief

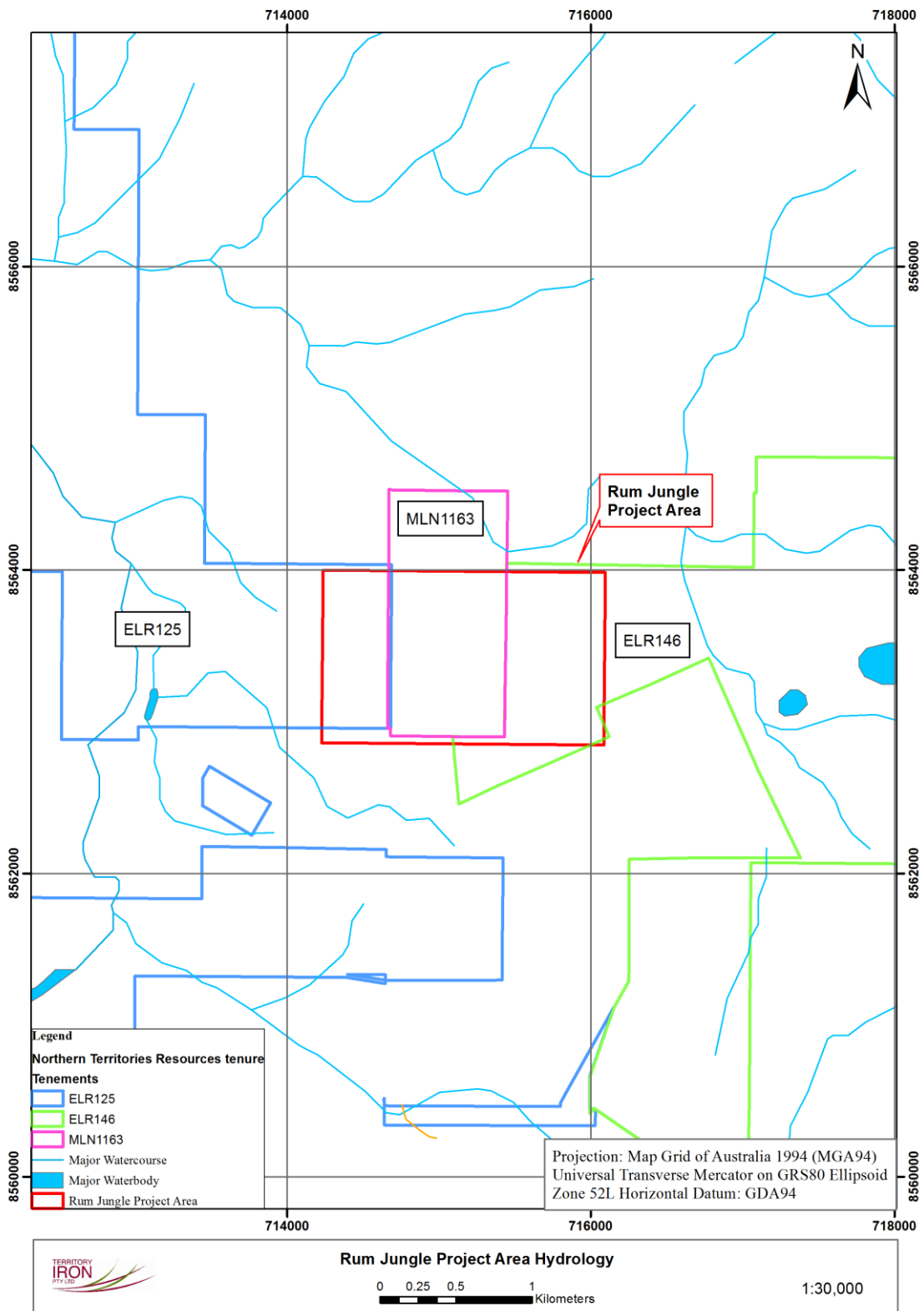


Figure 7: Rum Jungle Project Area showing hydrology

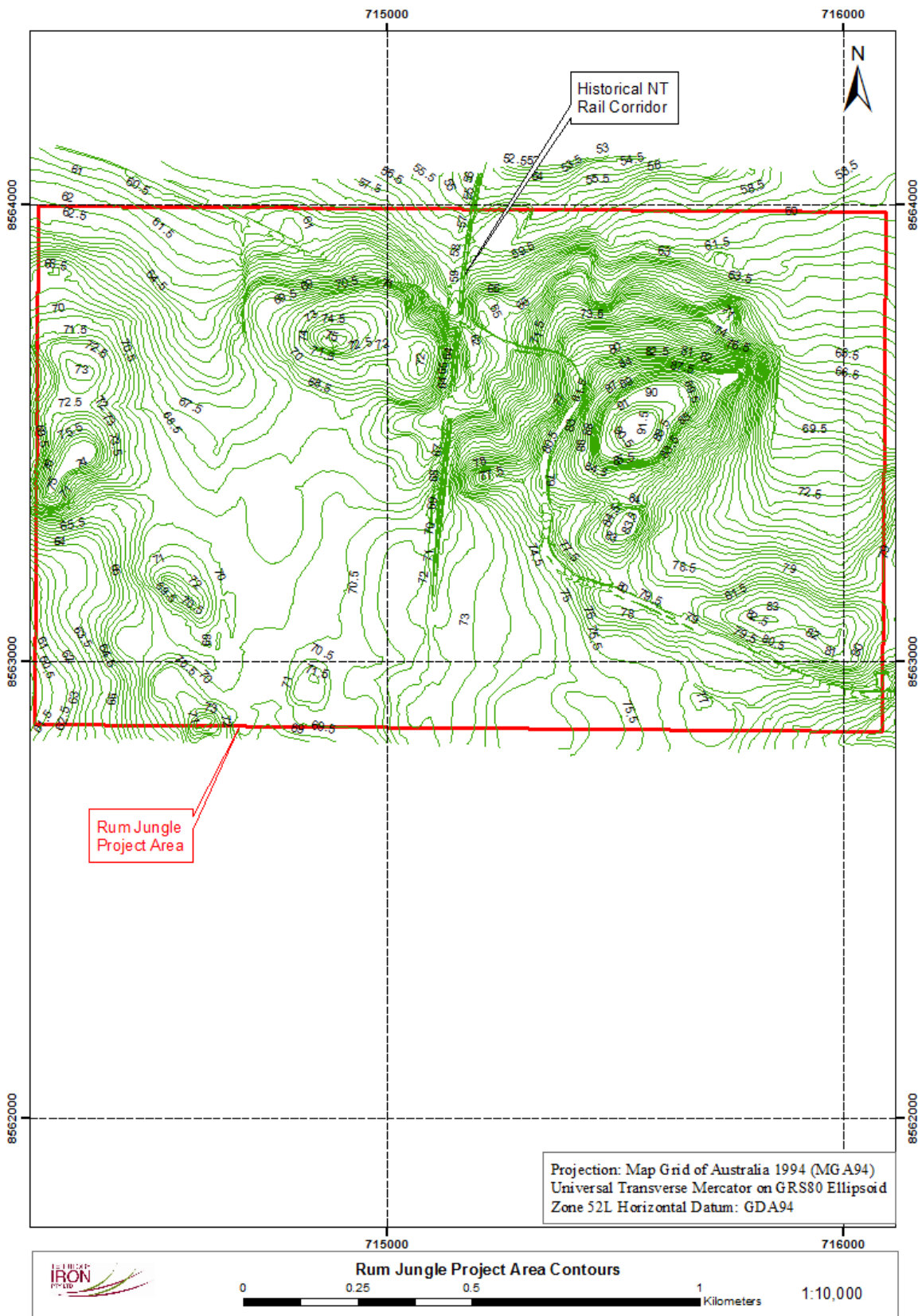


Figure 8: Rum Jungle Project Area Contours. Note that the historical Northern Territory rail corridor has mistakenly been included with the original contour data

3.1 PREVIOUS ACTIVITIES AND CURRENT STATUS

3.1.1 DRILL SITE ACTIVITY AND REMEDIATION

The entire exploration drill history for the Rum Jungle Exploration Project was described in detail in the May 2016 to May 2017 Rum Jungle Project Rehabilitation Report (Glass, 2016) and is documented again in this report for completeness.

The history of earlier exploration activities within the Rum Jungle Project Area, were documented by Rafty and Vivian (2006), Hassall (2008) and Bleakley (2012). Although not part of Territory Resources exploration activities and the current Rum Jungle Authorisation, for completeness and to provide some information on historical drilling and exploration activity almost 50 years ago, this report includes information about the Theiss Brothers Pty Ltd drill and exploration programme from 1967 to 1970.

Earliest exploration to 1998

Below is an excerpt (*verbatim*) from Rafty and Vivian (2006) describing the earliest exploration by other companies in the area.

“The first geological inspections of the Rum Jungle Mineral Field were conducted by Government geologists and reported uranium at Rum Jungle in 1912, and iron at Yarram in 1936 and in 1954.

The Rum Jungle Mineral Field was further investigated for uranium after the discovery of uranium by Jack White in August 1949 with follow-up investigations by the Government indicating the potential for 100,000 tons with grades of 57.6 – 61.2% Fe in surficial laterite. However, the enforced iron ore embargo of 1938 – 1960 discouraged further evaluation of the Rum Jungle iron ore occurrences. Uranium mining undertaken between 1954-1971.

Renewed interest in the Yarram iron ore deposits occurred in 1967 when Thiess Brothers Pty Ltd entered into a JV with the local landholder and the Commonwealth Government to explore the deposits which were on a now extinct reserve. From 1967–1970 Thiess conducted an extensive exploration program comprising detailed geological mapping (approx 1:1250), costeaning (sampling and mapping), and jack hammer, percussion and diamond drilling. Several iron mineralisation types were defined by Burban (1970):

- *Haematite Lode (Lodes A, B, C all striking NE with 60 – 66.8% Fe, 0.14% P; and D some 300m NW of Lode A (also striking NE) - located on the limbs of a NE–SW trending syncline.*
- *Low Grade Haematite (in vicinity of Lode A) with 50 – 60% Fe, 0.15% P.*
- *Haematitic Siltstone (20 – 60% Fe, 0.34% P) surrounding the Lodes.*
- *Laterite (20 – 60% Fe, 0.1% P) and ferricrete (secondary limonite-rich laterite) to 1.5m thickness and with 50% Fe 0.1% P grades forms as secondary products from the iron mineralisation.*
- *Rubble Ore as talus slope–detrital material varying in thickness from 0.5m – 2m and composed of goethite, limonite and siltstone.*

The resources estimated at Yarram East prospect by Burban (1970) were:

- *100,000 tons @ 61.8% Fe from 3 outcropping haematitic lodes (A, B & C).*
- *300,000 tons @ 55- 65% low grade haematite ore.*
- *1.5 million tons @ 50 – 55% Fe in a haematitic siltstone.*
- *8.7 million tons @ 40 – 50% Fe in laterite*

Poor core recoveries, inaccurate compilation of maps and sections and the discontinuous and variable nature of the deposit led Burban (1970) to conclude that these reserves figures were indicative only.

From 1970 – 1998 the Yarram area was explored for uranium and a number of steel droppers and aluminium tags listing coordinates remain as evidence of an extensive wide spaced grid system from this phase of exploration.

In 1998 Compass Resources NL drilled two RC holes (CRRC07 and 08) at Yarram East for base metal mineralisation, refer to Appendix 2 (of Rafty and Vivian, 2006) for details. Both holes penetrated laterite underlain by iron-rich sediments and dolomite. Better Fe values ranging between 30-44% Fe and 35-50.3% Fe were associated with the laterite and dolomite, respectively. Best values was 50.30% Fe and 7% Mn (from different drill intervals) from weathered dolomite in hole CRRC08”.

The historical drill hole and costean locations conducted by Theiss Brothers Pty Ltd in 1968 are shown in Figure 9 and on an expanded scaled with labels in Figures 10-12. Drill hole coordinates and other data for the Theiss Brothers exploration programme are located in **Appendix II**.

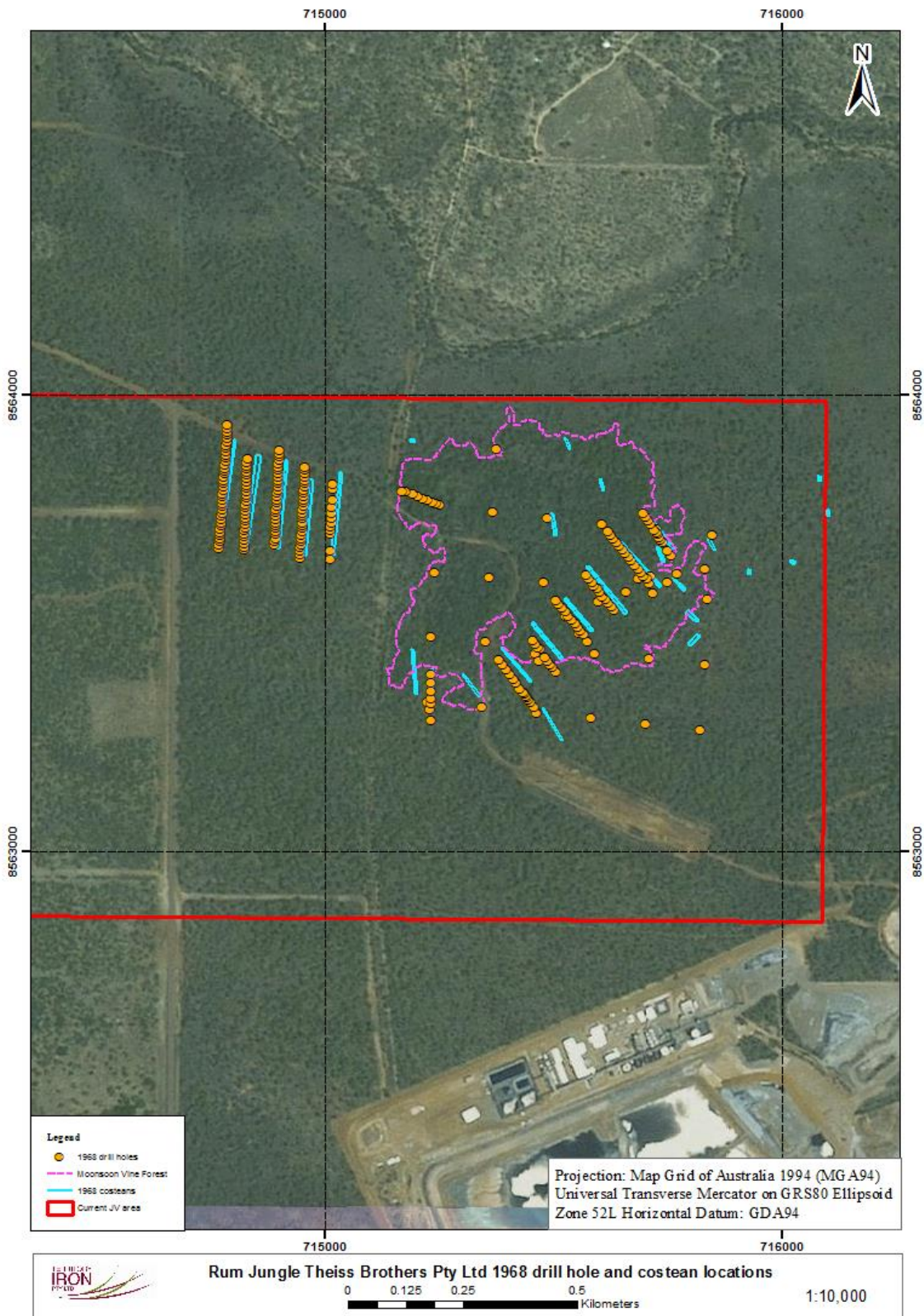


Figure 9: Location of 1968 drill holes and costeans conducted by Theiss Brothers Pty Ltd almost 50 years ago. The pink polygon defines the boundary of the monsoon vine forest and ESRI world satellite imagery defines background relief. The locations for the costeans were located by Territory Resources geologists in 2012

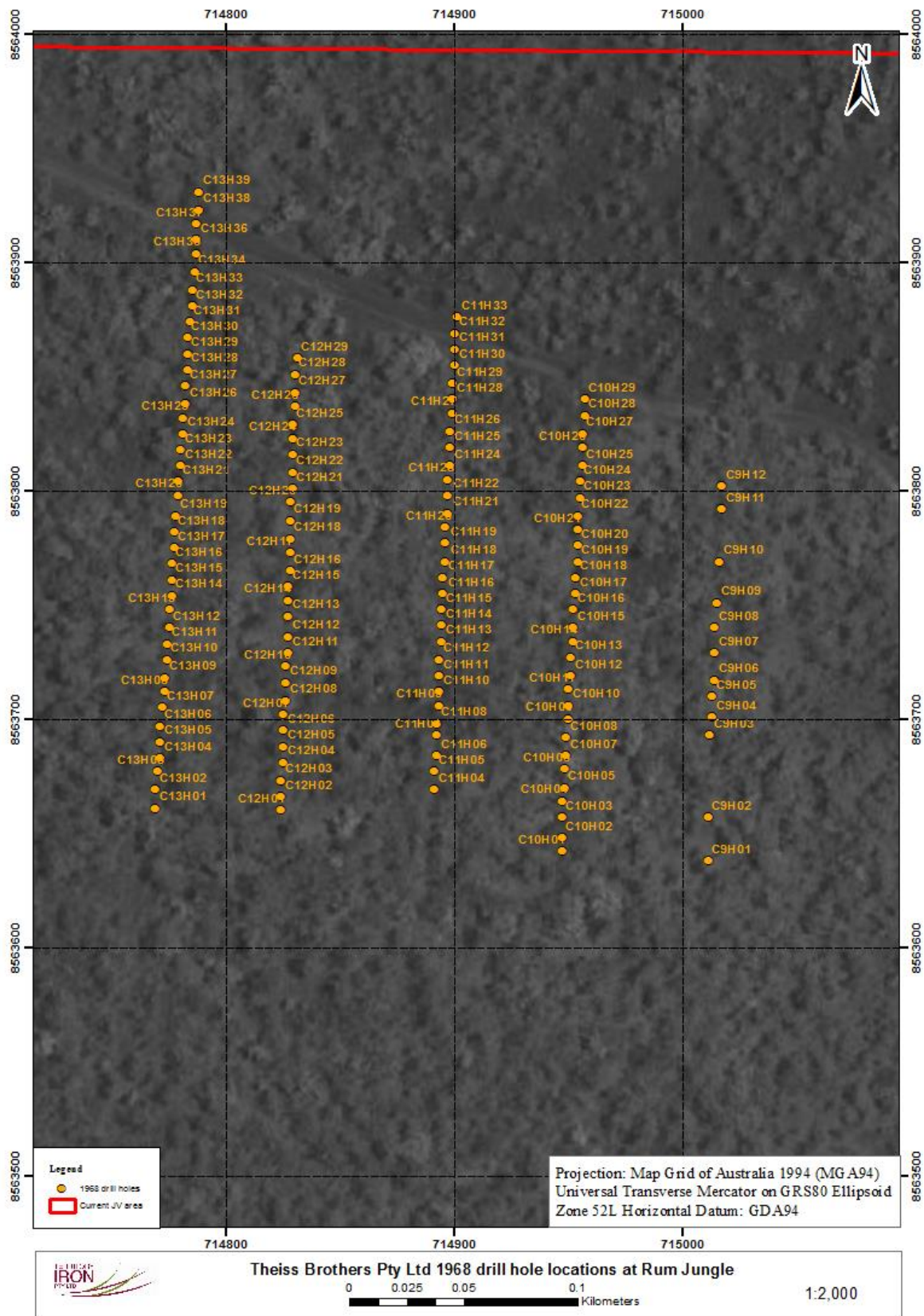


Figure 10: Drill hole detail for 1968 Thess Brothers Pty Ltd drill programme. ESRI world satellite imagery defines background relief

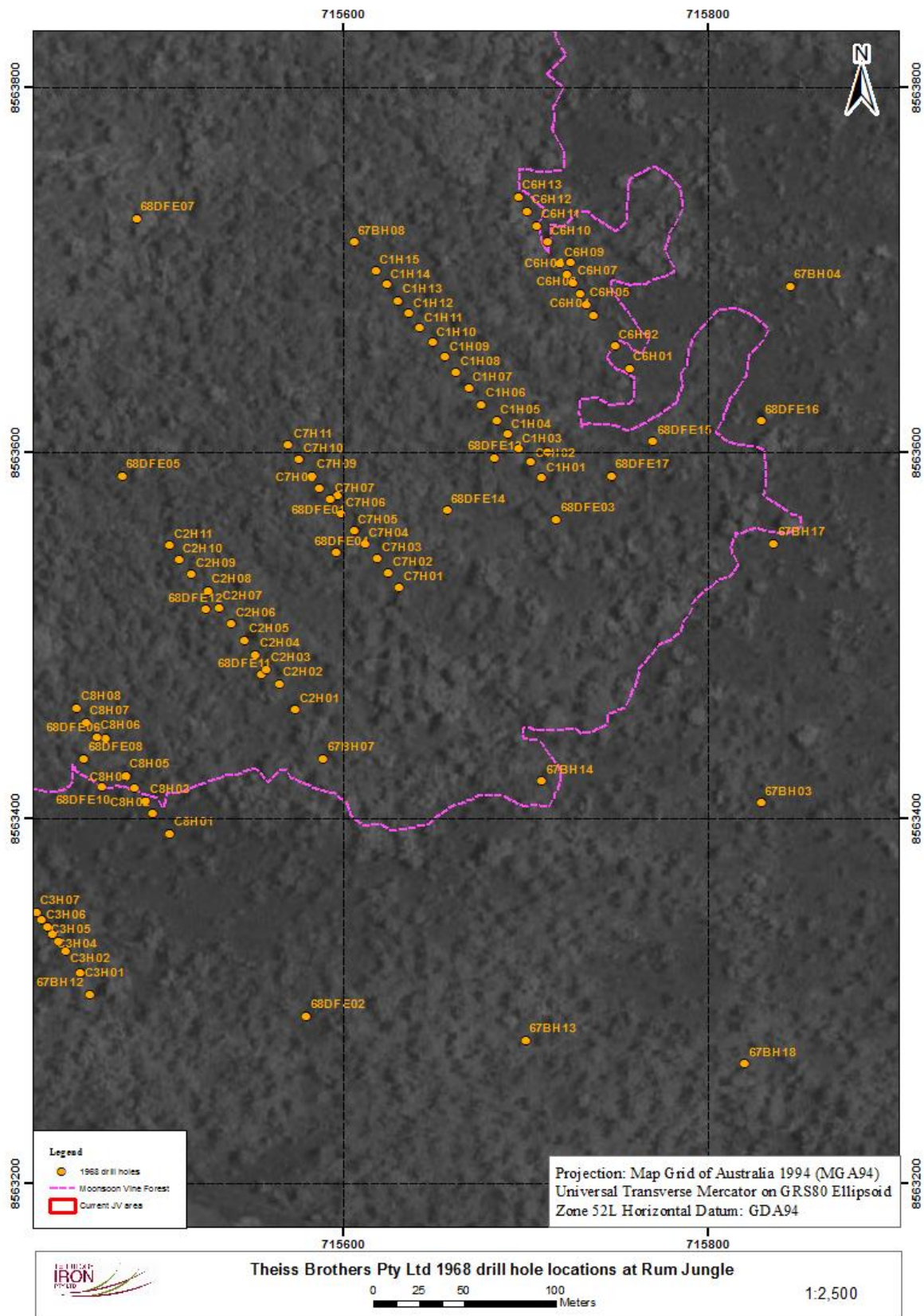


Figure 12: Drill hole detail for 1968 Theiss Brothers Pty Ltd drill programme. The pink polygon defines the boundary of the monsoon vine forest and ESRI world satellite imagery defines background relief

2005 MMP Reporting Period

From the 17th October to the 22nd October 2005, Territory Resources drilled 36 RAB drill holes over 325 m of strike length. The 2005 drill hole location data are shown in Figure 13 and on an expanded scale with labels in Figure 14. All data relating to the drill holes are documented in **Appendix II**. Below is an excerpt (*verbatim*) from Rafty and Vivian (2006) describing the Territory Resources exploration drill programme undertaken in 2005.

“The Yarram prospect is located about 8 km NW of Batchelor and some 61 km SSE of Darwin in the Northern Territory and covers an approximate 2.1sq km area over tenements ERL125, ERL146 and MLN1163. Territory Iron’s exploration activities was confined to the three haematite lodes (A to C) at Yarram East, which lies solely within ERL146, and comprised:

- *air photography survey flown over the three tenements;*
- *ground control survey for air photo ortho rectification and photogrammetry;*
- *mapping at 1: 1,000 scale;*
- *36 holes/1,340m of RAB drilling over 325m of strike length of haematite lodes A to C and,*
- *limited screening testwork on -6.3mm to -0.6mm size fractions on percussion drill samples to determine whether lower grade (+50-58% Fe) mineralisation was amenable to upgrading.*

All thirty-six RAB drill holes were located within ELR146 and within the Finnis River Aboriginal Land Trust. In May 2005, fire breaks were positioned around the perimeter of the prospect utilising the existing E-W and N-S grid lines that were emplaced in the 1960’s.

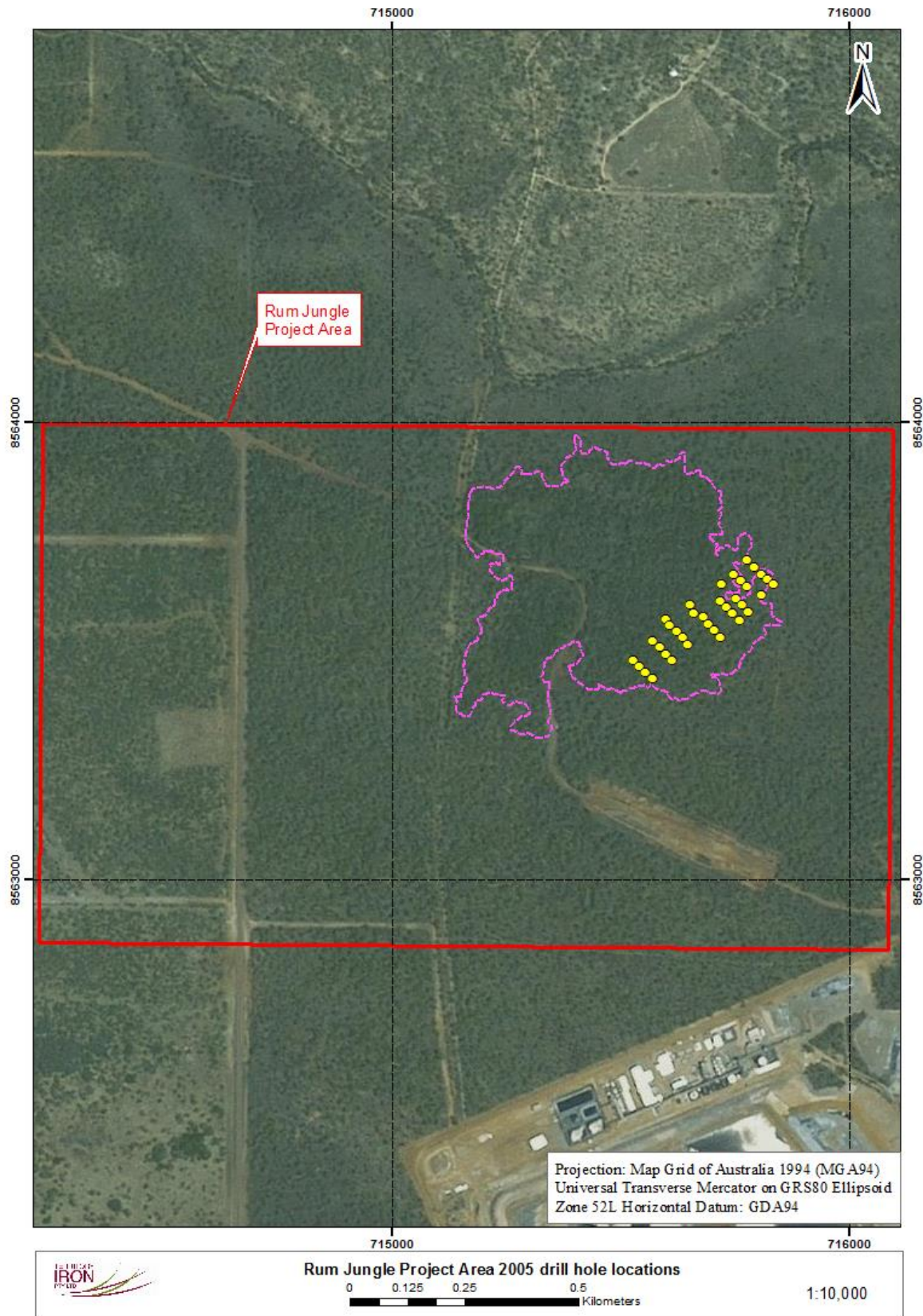


Figure 13: Location of 2005 drill holes (yellow dots). The pink polygon defines the boundary of the monsoon vine forest and ESRI world satellite imagery defines background relief

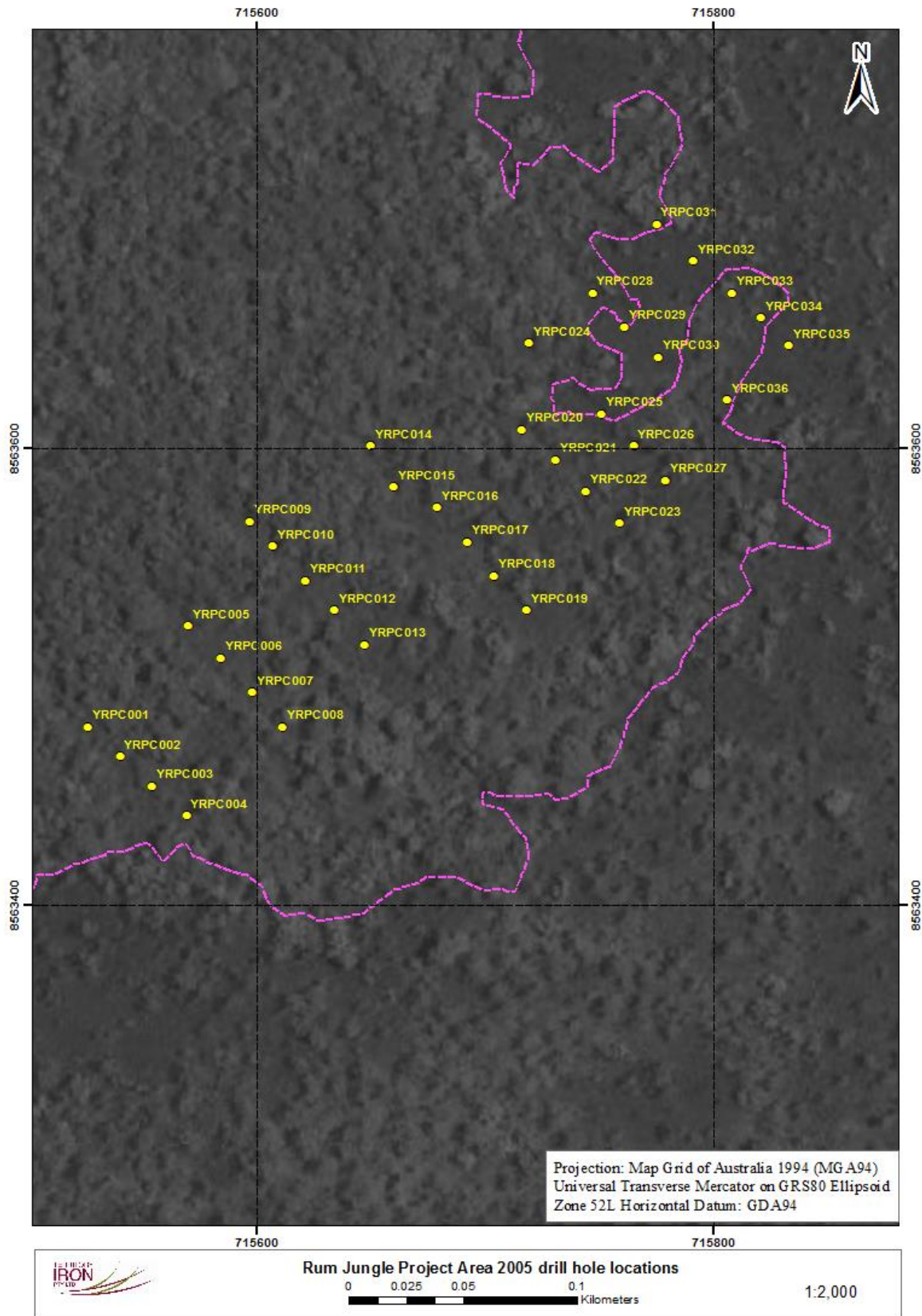


Figure 14: Detail of 2005 drill holes. The pink polygon defines the outer boundary of the monsoon vine forest and ESRI world satellite imagery defines background relief

2008-2009 MMP Reporting Period*Proposed*

For the 2008 to 2009 exploration period, a phase 1 drill programme involving 44 drill holes with a maximum depth of 100 m was proposed (Hassall, 2008). The drill holes were designed to be 20 x 20 metre spacing in order to infill the earlier 2005 drilling. Hassall (2008) also mentions a drill proposal for 13 Reverse Circulation (RC) drill holes to a maximum depth of 100 m. From the report, it is not clear whether the original proposed 44 drill holes were to be RC as well. The suggested security for the proposed drill programme was calculated to be \$12,960.

Actual

The proposed drill programme never eventuated and is explained (*verbatim*) by Bleakley (2012) as follows:

“No further work was undertaken by Territory Iron up until very recently, as exploration and resource development drilling programmes were solely focussed at the Company’s flagship Frances Creek Mine further south, ahead of full scale mining production there, which commenced in early 2007.”

2012-2013 MMP Reporting Period*Proposed*

Reconnaissance geological mapping and sampling programmes undertaken by Territory Resources from December 2011 to January 2012 indicated the potential for iron ore mineralisation beyond the 2005 drilling extent. On this basis, a 2012 drill programme for approximately 619 drill holes including Aircore (AC), RC and Diamond drilling was proposed for the May 2012 to March 2013 drill season in the 2012-2013 MMP (Bleakley, 2012) which was submitted on the 22nd March 2012. The proposed programme involved three phases of drilling, with later phases dependent on results of the earlier phases. The drill proposal included Heritage and Environmental flora and fauna surveys to be conducted prior to site excavation and drilling. The calculated security for the drill programme was \$120,866 (Bleakley, 2012). Additional information regarding the proposed drill programme was requested by the then Department of Resources (DoR) on the 30th April 2012. After consultation with the then Department of Natural Resources, Environment, The Arts and Sport (NRETAS), the DoR contacted Territory Resources on the 13th August 2012 stipulating that all exploration activities must be excluded from the monsoon vine forest including a 50 m buffer around the area. In response to this letter, Territory Resources commissioned EcOz Environmental Services to undertake an on-ground survey to delineate the boundary and extent of the monsoon vine forest (Smith, 2012). In this report, the monsoon vine forest is described as being an intact example *“which commonly occurs throughout the Top End as small discrete patches”*.

A revised MMP addressing all the additional information required by the DoR (including the EcOz study) was submitted on the 6th September 2012 and approval was granted in October 2012, with a condition of Authorisation stipulating that *“No substantial disturbance is to be undertaken with 50 metres of the monsoon vine forest”*. The total security calculated by the Department of Mines and Energy (DME) for the 2012-2013 drill programme was \$164,915. The DME already held \$3,000 as security from an earlier approval and an additional \$161,915 was paid to the DME on the 4th October 2012.

On the 8th February 2013, a further amendment to the 2012 MMP was submitted to the DME to include a reduced, selective drill programme within the monsoon vine forest based on the successful rehabilitation of drill activities by Theiss Brothers Pty Ltd within the monsoon vine forest almost 50 years ago. In the original 2012 MMP, Territory Resources had proposed a more extensive drill programme but upon review, only nineteen drill holes were proposed for this amendment. On the 8th April 2013, the DME issued a letter to Territory Resources indicating that an additional security of \$36,652 was required before approval could be granted. The amount was paid and the MMP and amendment were accepted on the 23rd May 2013. This brought the total security held by the DME to \$201,567.

Actual

Due to budget constraints and re-prioritisation of the Territory Iron exploration strategy, the proposed drilling program was not conducted during the 2012-2013 MMP period and no other work was completed during this period. There was a change of exploration focus from more regional projects (i.e. Rum Jungle) to exploration activities restricted to near-mine resource development at the then operating Frances Creek mine site, located about 23 km north of Pine Creek.

2013-2014 MMP Reporting Period

As outlined in the previous section, approval from the DME for the 2012 MMP and subsequent amendments were granted to Territory Resources on the 23rd May 2013. The Authorisation Letter also included a request for Territory Resources to review and submit an updated MMP before the 25th May 2013. Territory Resources duly requested a waiver from submitting the 2013-2014 MMP, as the 2012 MMP and amendment were only approved by the DME two days before the new 2013-2014 MMP submission date. In addition, Territory Resources reported that no exploration activity was undertaken within the previous twelve months. The waiver was accepted by the DME and a new submission date of 25th May 2014 was given.

On October 2013, the DME introduced an amendment to the Mining Management Act and Regulations to include for each Authorisation, a 10% discount on the total security held and the payment of an annual levy of 1% of that remaining security. For the \$201,567 held by the Department as of the 1st October 2013, a refund of 10% (\$20,157) left the balance of the security at \$181,410.

A 1% levy on of \$1,814 left Territory Resources with a refund of \$18,343.

2014-2015 MMP Reporting Period*Proposed*

A drill programme was initially proposed for the latter half of the May 2014 to May 2015 reporting period, scheduled for 2015 (Syka, 2014). The proposed programme comprised part of the DME approved programme outlined in the Rum Jungle 2012 MMP and sought to maintain the minimal disturbance required for the monsoon vine forest. Eighty-five (85) RC drill holes were planned for 6986 metres, Figure 15.

The drilling was planned to:

- determine the extent of the defined resource below 35m depth (as defined in the 2005 drill programme)
- determine the lateral extension of the defined resource to the southwest and northeast and,
- determine the subsurface extent under sub-cropping hematite to the west northwest of the defined resource

The proposed 2014-2015 drill program represented a selective portion of the proposed program as detailed in the approved amended 2012 Rum Jungle MMP. The security for the 2014-2015 drill programme was calculated to be \$117,113.13. This value was significantly less than the security bond held by the DME at the time (\$198,567) therefore no additional security was required (Syka, 2014).

Actual

From the 29th September 2014 to the 29th November 2014, one hundred and ten (110) RC holes for a total of 5,674 metres were drilled in the Rum Jungle Project Area, Figure 16. All data relating to the drill holes are located in **Appendix II**. Below is an excerpt (*verbatim*) from Glass (2015).

“The proposed drill programme as detailed in the 2014-2015 MMP nominated 85 RC holes for a total of 6986 metres. The October-November 2014 drill programme commenced with 85 drill sites prepared for drilling. Although the 2014 October-November drill programme increased the number of holes drilled by 25, the total metres drilled were significantly less (~1300 m less). This was due to the drill programme being modified as

assay (and drill) results came to hand during the drilling operation. The drill plans were changed to best target the mineralisation intersected in the drill sections and test the extent of the sub-surface mineralisation and extend the mineral potential. The 2014 drilling comprised a component of the DME approved programme proposed in the Rum Jungle 2012 MMP and a DME approved amendment for a minimum disturbance drill programme in the Monsoon Vine Forest (MVF) in 2013”.

In all instances, pre-existing access tracks and drill sites from previous drill programs were used preferentially to avoid unnecessary disruption to non-disturbed vegetated areas and to ensure that land clearing was kept to an absolute minimum and significant flora preserved. For the 2014 drill programme, 3.3 line km of track was cleared. The tracks were cleared to a maximum of three (3) metres wide, which is sufficient clearance for all drill-related vehicles. Topsoil over drill pads and tracks were retained in order to be redistributed over the disturbed ground at end of the drilling program during the rehabilitation process.

*At all times during the land clearing process, a representative from the Finnis River Land Trust (a Traditional Owner Elder) was present to supervise the earthworks process and ultimately decide which significant flora (e.g. large or significant trees, *Cycas armstrongii* etc.) should be preserved. In areas where vegetation of significance were selected, the track was slightly modified to deflect around and preserve these trees and other flora. The drill site and track locations were modified on a metre scale accordingly to meet these criteria.*

Two Territory Resources Land Disturbance Permits (LDP's - internal environmental permits) were submitted to Territory Resource's Environmental and Community and Heritage Departments for approval from these departments prior to any land disturbance.

During the course of the 2014 drill programme, “potentially” asbestiform minerals were identified by the supervising drill rig geologist. An Asbestos Management Plan was initiated and immediately enforced (see page 10 and Appendix III of Glass, 2015 for full details). Laboratory test results indicated that the minerals were **not** asbestiform in nature and were dominantly talc and organic fibre. Mineral identification reports are located in Appendix V of Glass (2015). For all reports and information relating to the 2014 drill programme, please see Glass (2015).

2015-2016 and 2016-2017 MMP Reporting Periods

There was no ground disturbing land activity for the 2015 to 2016 and 2016 to 2017 reporting periods.

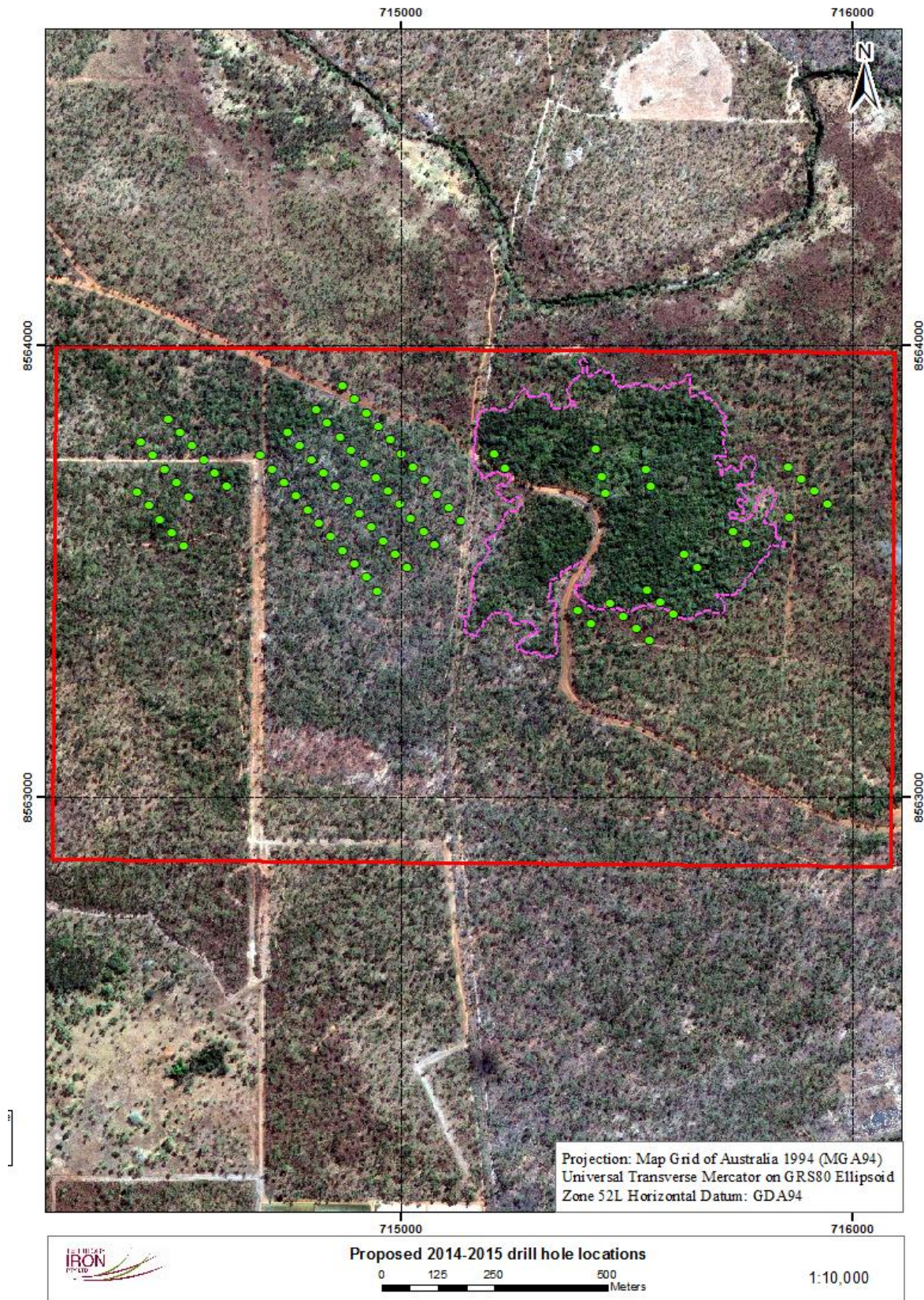


Figure 15: Location of *Proposed* drill holes (green dots) for the 2014-2015 drill programme. The pink outline shows the outer boundary for the monsoon vine forest and ESRI world satellite imagery defines background relief

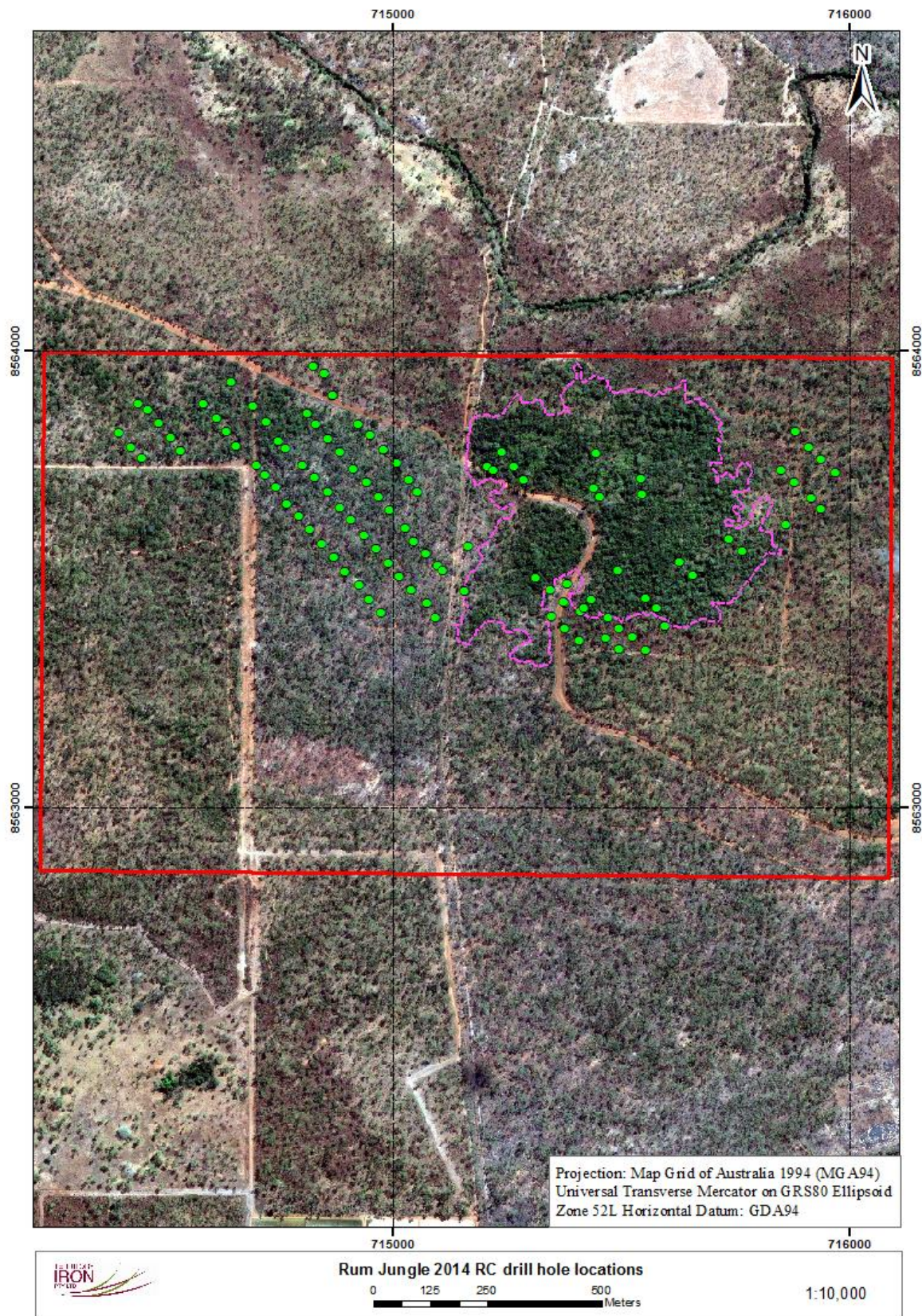


Figure 16: Actual location of 2014 drill holes (green dots). The pink outline shows the outer boundary for the monsoon vine forest and ESRI world satellite imagery defines background relief

Table 5: History of Territory Resources Exploration Drill Programmes for Rum Jungle Exploration Project

Territory Resources Exploration Drill Activities	2005 Actual Drill Programme	* ³ 2008-2009 Proposed Drill Programme	* ³ 2012 Proposed Drill Programme	2014-2015 Proposed Drill Programme	2014 Actual Drill Programme
Mining Interests	ELR146	<i>ELR146, MLN1163</i>	<i>ELR125, ELR146, MLN1163</i>	<i>ELR125, ELR146, MLN1163</i>	ELR125, ELR146, MLN1163
Timing of exploration	17-22 October 2005	<i>2009</i>	<i>May 2012 to March 2013</i>	<i>May 2014 to May 2015</i>	September to November 2014
Expected duration of exploration	6 days	<i>Not stipulated</i>	<i>~ 11 months</i>	<i>~ 1 year</i>	8 weeks
Type of drilling	RAB	<i>?RC</i>	<i>AC, RC, Diamond</i>	<i>RC</i>	RC
Target Commodity	Iron ore	<i>Iron ore</i>	<i>Iron ore</i>	<i>Iron ore</i>	Iron ore
Is drilling likely to encounter radioactive material?	Unknown	<i>Unknown</i>	<i>Unknown</i>	<i>Unknown</i>	Unknown
Number of drill holes	36	<i>44 (+13?)</i>	<i>619</i>	<i>85</i>	110
Maximum depth of drill holes (m)	68	<i>100</i>	<i>80</i>	<i>120</i>	162
Number of drill pads	* ¹ Assume 10 m x 3 m n=36 (1080 m ² = 0.108 ha)	<i>Assume 15 x 15m; n=44 (9900 m² = 0.99 ha)</i>	<i>*⁴ 619 (AC 10 x 3 m n=320 (9600m² = 0.960 ha)) (RC 20 x 10 m (55,000 m²=5.5 ha)) (Diamond 20 x 10 m (4,800 m²=0.48))</i>	<i>15 m x 15 m n=85 (19125 m² = 1.95 ha)</i>	15 m x 15 m n=110 (24750m ² = 2.475ha)
Is drilling likely to or did it encounter groundwater?	Not recorded	<i>Unsure</i>	<i>Unsure</i>	<i>Unsure</i>	No
Number of Sumps (Length: x Width: x Depth: m)	N/A	<i>N/A</i>	<i>24 sumps planned</i>	<i>N/A</i>	N/A
Length of Line/Track Clearing	* ² 0.916 km x 3 m = 2,478 m ² (0.28 ha)	<i>Not clear</i>	<i>*⁴ 22.5 km x 3m = 67,500 m² (6.75 ha)</i>	<i>3.6 km x 3 m= 10,800 m² (1.08 ha)</i>	3.3 km x 5 m = 9,798 m ² (0.98 ha)
Number of Costeans (Length: x Width: x Depth: m)	N/A	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	N/A
Total Bulk Sample (Length: x Width: x Depth: m)	N/A	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	N/A
Will Topsoil be removed for Rehabilitation Purposes?	Not mentioned	<i>Yes</i>	<i>Assumed yes</i>	<i>Yes</i>	Yes
Previous Disturbance Yet to be Rehabilitated on Title (ha) if known	N/A	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	N/A
Camp (Length: x Width: m)	N/A	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	N/A
Total Area disturbed (hectares)	0.38 ha	<i>Nil</i>	<i>13.7 ha proposed</i>	<i>Nil</i>	3.45 ha
Status of Rehabilitation	Completed	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	Drill holes and tracks completed. Mitigation plan currently in place to control gamba grass
Other		<i>The drill programme never eventuated</i>	<i>The drill programme never eventuated</i>	<i>The drill programme never eventuated</i>	

N.b. Proposed drill programmes that never eventuated are shown as blue italics and drill programmes that were undertaken are shown in black

*¹ Assume 10m x 3m drill pad area similar to Aircore specifications

*² Track length calculated at 3 metres width

*³ The proposed drill programme never eventuated

*⁴ Calculations from Bleakley (2012)

3.2 PROPOSED ACTIVITIES

There are no planned land disturbing exploration activities proposed for the Rum Jungle Exploration Project for the 2017-2018 MMP reporting period. There will be routine inspections to monitor drill site remediation and twice yearly audits for weed monitoring (see Section 6.1.3 *WEED MANAGEMENT* and 6.1.3.1 *Gamba Grass Management Plan*. The next weed monitoring survey will be conducted July 2017.

4.0 CURRENT PROJECT SITE CONDITIONS

The MMP reporting area covers an area of 2.13 km², Figures 3-6. The information in this section (and ecological reports referenced in **Appendix III**) provides an overview of the landforms, fauna and flora in the region.

A NT NRM Report for information relating to the Rum Jungle Exploration Project is located in **Appendix III**. The website link for accessing the data is www.ntinfo.net.org.au. The report provides information relating to climate, soil types, vegetation communities, fire history, threatened species, identified weeds and pests.

4.1 LOCAL AND REGIONAL GEOLOGY

4.1.1 REGIONAL GEOLOGY

The Rum Jungle (Yarram) project area is located within the Palaeoproterozoic Pine Creek Orogen which forms part of the North Australian Craton. The Pine Creek Orogen covers an area of ~50,000 km² and represents a >4 km succession of carbonate, clastic and carbonaceous sedimentary and volcanic rocks, which unconformably overlie Neoproterozoic (~2500 Ma) basement granite and gneiss. Based on the timing of sedimentation, magmatism and metamorphism, the Pine Creek Orogen has been divided into three distinct domains, from west to east; the amphibolite to granulite facies Litchfield Domain, the greenschist facies Central Domain and the amphibolite facies Nimbuwah Domain. The Frances Creek mine site and adjacent exploration area is located within the Central Domain.

In the Central Domain, the oldest rocks in the region are the Dirty Water and Stanley Metamorphics which stratigraphically underlie Neoproterozoic 2674 Ma Woolner Granite and 2545–2520 Ma, Rum Jungle Complex respectively. The Rum Jungle Complex is comprised of the Rum Jungle and Waterhouse domes. Overlying Palaeoproterozoic stratigraphy include the ~2020 Ma Woodcutters Supergroup (Nameoona Group, (Masson Formation) Manton Group (Beestons Formation and Celia Dolostone) and Mount Partridge Group (Crater Formation, Coomalie Dolostone, Whites Formation) Mundogie Sandstone, Wildman Siltstone, Acacia Gap Quartzite Member, Mount Deane Volcanic Member), Ahmad and McCready, 2001). These are unconformably overlain by the ~ 1860 Ma Cosmo Supergroup (South Alligator Group, (Koolpin Formation, Gerowie Tuff and Mount Bonnie Formation) and Finniss River Group, Burrell Creek Formation, Chilling Sandstone). The stratigraphy was intruded by the Zamu Dolerite.

Syn- to post-orogenic activity is represented by intrusion of the 1835-1800 Ma Cullen Supersuite granitoids. Intrusion of the granite led to contact aureoles in the surrounding pre-orogenic Masson Formation, Mundogie Sandstone and Zamu Dolerite.

Two major episodes of folding are recognised, earlier tight to isoclinal F1 folds followed by younger open (widely spaced) folds (Stuart-Smith et al., 1987). The major structural controls in the tenement area are related to D3 1-3 km scale northwest-trending non-cylindrical folds, which plunge gently to the northwest to form a series of anticlines and synclines pre-dating the intrusion of the Cullen Supersuite, and 1-3 km long northwest and northeast-trending faults.

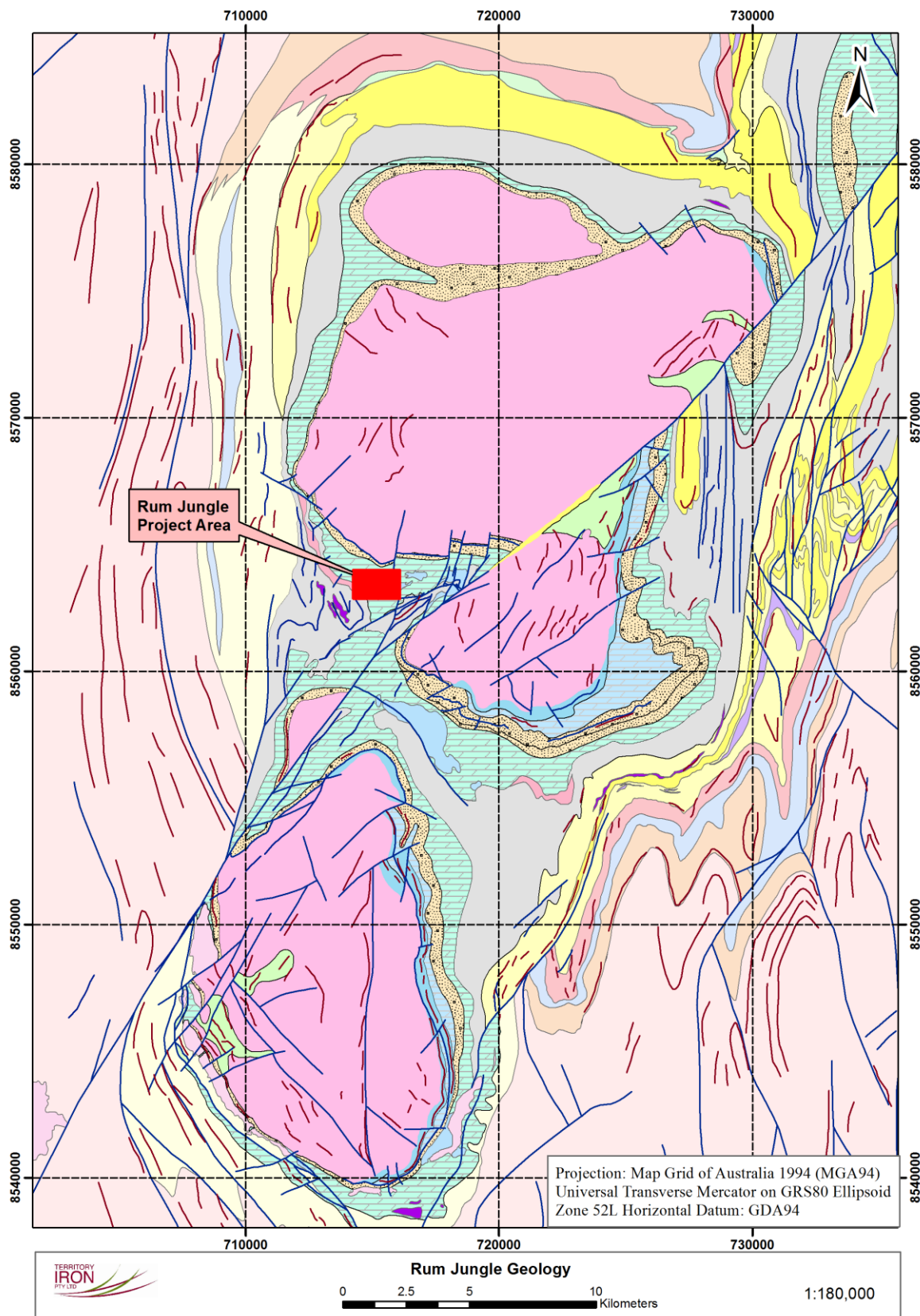


Figure 17: 1:100,000 solid geology map for the Rum Jungle Project Area. The red rectangle defines the boundary for the Rum Jungle (Yarram) project area.. Geological background map is from Lally (2003). This reference documents all the stratigraphic names for the individual geological units

4.1.2 LOCAL GEOLOGY

In the project area (Figures 18, 19) the Rum Jungle Complex Neoproterozoic granite and gneiss is unconformably overlain by the Beestons Formation (Manton Group), which is comprised of a coarse, poorly sorted, feldspathic sandstone overlain by a thin, vein quartz pebble conglomerate (Ahmad *et al* 2006). Unconformably overlying the Beestons Formation is the poorly outcropping Celia Dolostone (Manton Group), a silicified dolostone, dolostone or stromatolitic magnesite.

The Manton Group stratigraphy is unconformably overlain by the Mount Partridge Group, including the basal Crater Formation, which is a poorly sorted conglomerate/sandstone unit, consisting of clasts of pebble- to boulder-sized hematitic banded ironstone and vein quartz in a quartz-hematite matrix, overlain by a well-sorted, arkosic coarse sandstone (Ahmad *et al* 2006). Conformably overlying the Crater Formation is the poorly-outcropping Coomalie Dolostone. The Coomalie Dolostone is composed of stromatolitic magnesite and dolostone, with minor interbedded units of calcareous metapelite and para-amphibolite (Ahmad *et al*, 2006). It is this unit (sub-surface) that the Rum Jungle (Yarram) project is located over, Figure 19. The Whites Formation conformably overlies and interfingers with the Coomalie Dolostone and is conformably overlain by the Wildman Siltstone (finely laminated argillite and shale) containing the Acacia Gap quartzite member and the Mt Dean Volcanics para amphibolite member.

Around the southern margin of the Rum Jungle Complex, the Geolsec Formation sedimentary strata unconformably overlie the Coomalie Dolostone. It is a hematitic quartzite breccia (HQB), including hematitic sandstone, siltstone and mudstone, with rare shale breccia. The siltstone is phosphate rich with microcrystalline fluoroapatite ($\text{Ca}_{10}(\text{PO}_4)_6\text{F}_2$) associated with hematitic siltstone. Contemporaneous development of the phosphatic siltstone and breccia suggest the breccia may have been deposited into a shallow marine environment (Lally 2002).

Multiple folding and faulting events affected Pine Creek Orogen rocks from 1880-1760 Ma. Early northwest-directed thrusts were overprinted by tight to isoclinal north-trending folds, accompanied by upper greenschist-facies metamorphism. Open folding and kinking was the distal expression of granite emplacement to the east and southeast. Retrograde lower greenschist-facies metamorphism accompanied regional-scale, northwest-trending strike-slip faulting. Multiple deformation events are recorded in the Rum Jungle Mineral field.

The major structural feature in the Rum Jungle area is the >200 km Giants Reef Fault, Figure 18. The Giants Reef Fault is a major northeast-trending dextral strike-slip fault which has undergone vertical and horizontal displacement.

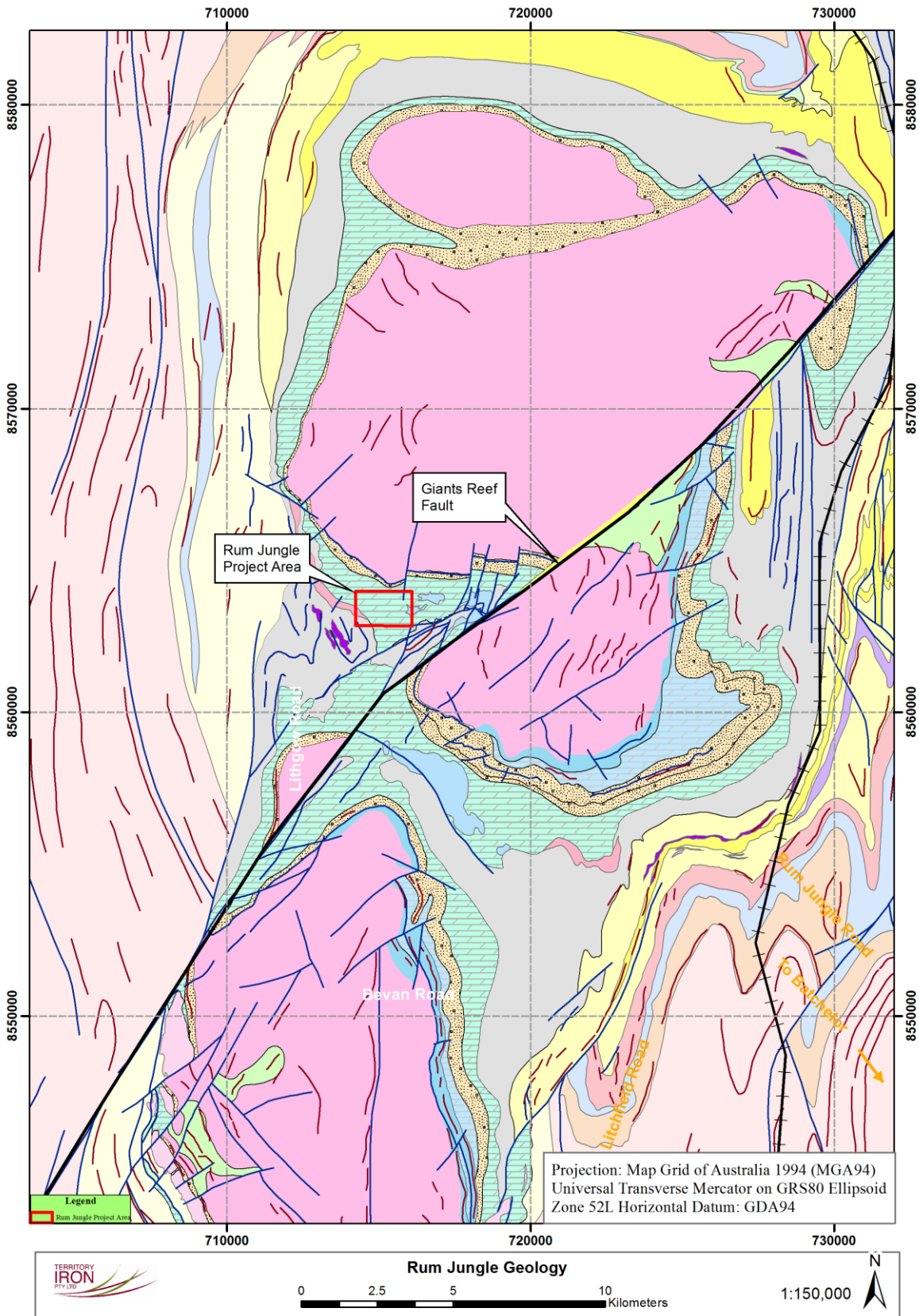


Figure 18: 1:100,000 solid (interpreted) geology map (modified from Lally, 2003) for the Rum Jungle Project Area. A description of the labelled stratigraphic units is provided in Section 4.1.2 Local Geology of this report. The red rectangle defines the boundary for the Rum Jungle (Yarram) project area.

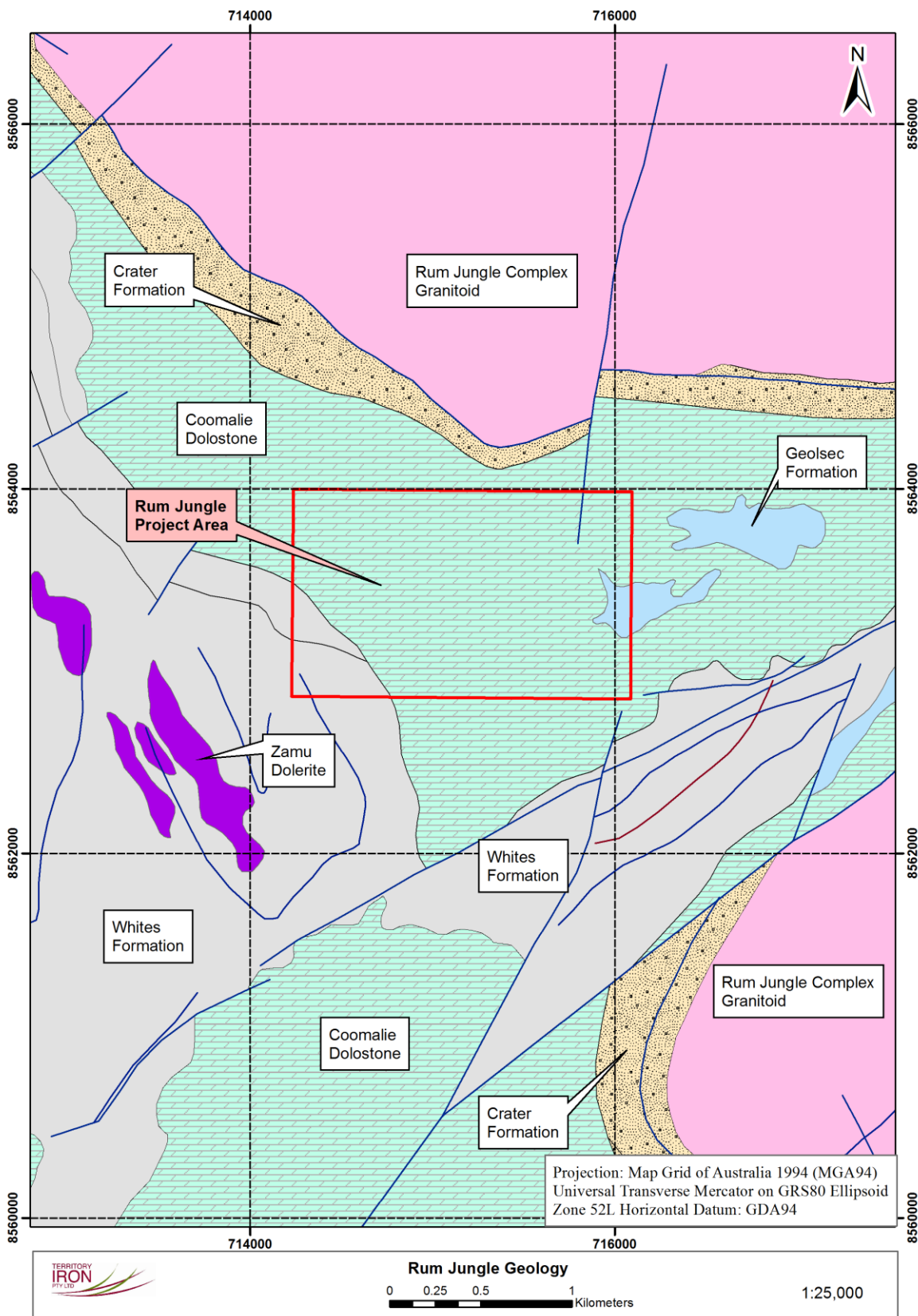


Figure 19: Detail of 1:100,000 solid (interpreted) geology map (modified from Lally, 2003) for the Rum Jungle Project Area. A description of the labelled stratigraphic units is provided in *Section 4.1.2 Local Geology* of this report. The red rectangle defines the boundary for the Rum Jungle (Yarram) project area.

The portion of ELR125 that overlaps with the Rum Jungle (Yarram) Joint Venture area comprises subsurface Coomalie Dolostone and the Whites Formation, Figure 19. The area is dominated by laterite with outcropping ironstone including both hematite (Fe_2O_3) and goethite ($\text{FeO}(\text{OH})$).

Significant U, Pb Zn, Ag, Cu, Ni, Co and Au mineralisation is associated with the Rum Jungle area. Sub-economic occurrences of phosphate, magnesite and iron ore are also documented in the region. Iron mineralisation was not described in the explanatory notes for the Rum Jungle region (Lally 2002) although they were annotated on the NTGS 1:100,000 Interpreted Geology Special Map (Lally 2003).

4.1.3 SOILS DERIVED FROM GEOLOGICAL SUCCESSIONS

As documented in the NT NRM Report, Rum Jungle (**Appendix III**), the Rum Jungle Project area was too small to produce reliable statistics regarding an accurate assessment of soil type. However, on a broad scale, based on the 1:2,000,000 CSIRO Atlas of Australian Soils subset identified in the NT NRM Report, the Rum Jungle Project Area is most likely dominated by hydrosol soils.

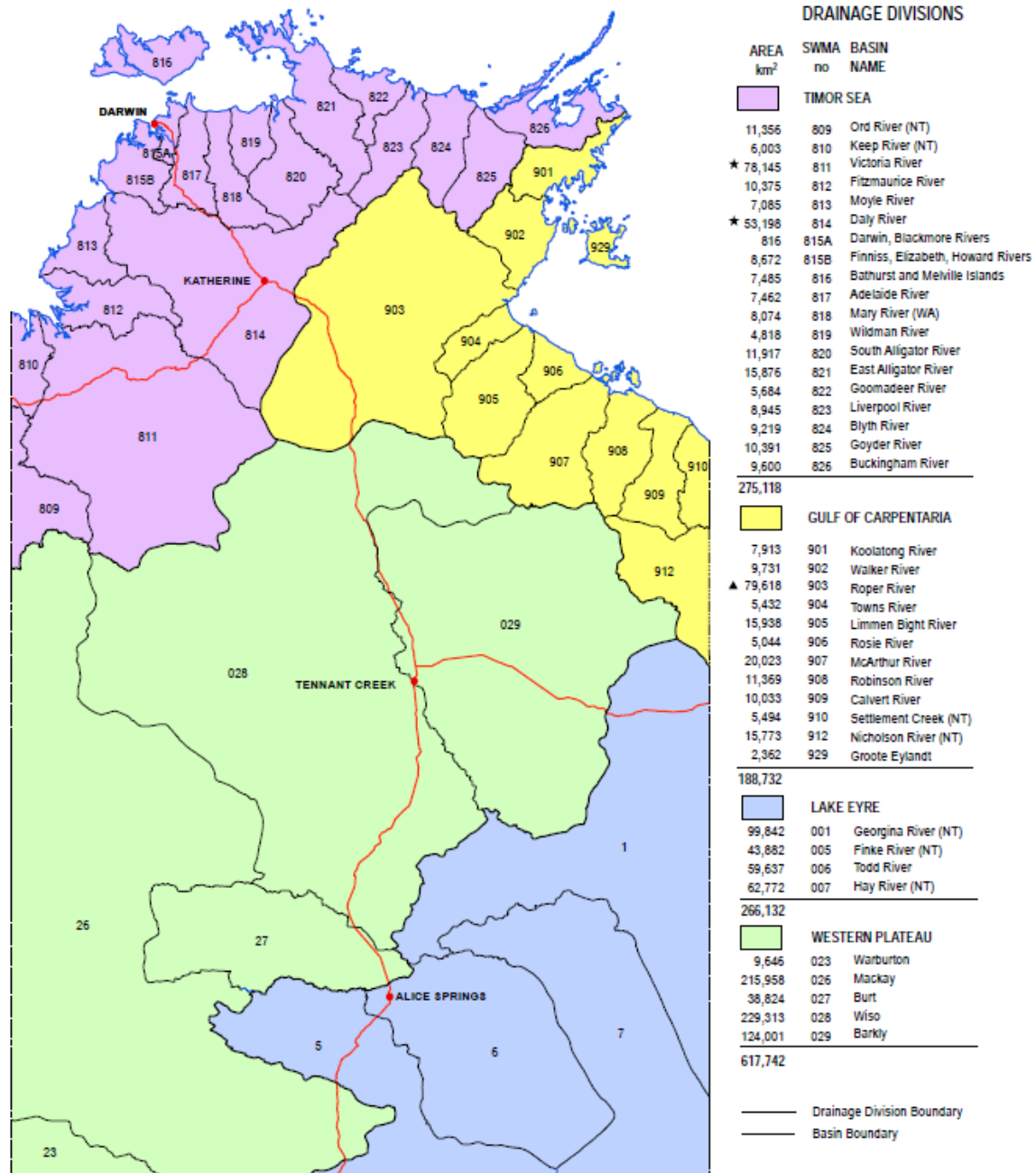
A definition for hydrosols is described on the CSIRO Australian Soil Classification website, http://www.clw.csiro.au/aclep/asc_re_on_line_V2/hy/hydrsol.htm and is summarised here. Hydrosol soils cover a diverse range of seasonally or permanently wet soils and a key component to these soils is that they are saturated for prolonged periods of time (~ 2-3 months). The soils are often characterized as "gley" soils which are typically grey to blue in colour and also with ochre-red mottling indicative of zones of reduction and oxidation.

Adjacent soils defined by the NRM search include kandosols (non-cracking clays). Kandosols are soils that do not have a strong textural contrast between the A and B horizons. They have a massive or weakly structured B horizon and are not calcareous. The parent material of kandosols ranges from highly siliceous, siliceous to intermediate in composition.

4.2 HYDROLOGY

The Rum Jungle Project area is located over low-lying, gently undulating ground which includes low hills, ridges and undulating plains. It's located about 2km north of the Brown's Oxide mine site, east of the East Finniss River. The region is subject to a monsoonal wet season and alternating dry season with heavy rainfall and surface water run-off occurring during the wet season.

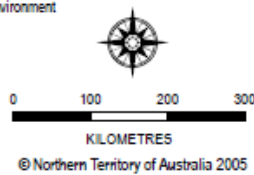
The Project Area lies within the Finniss, Elizabeth and Howard Rivers Basin area designated 815B on the Top End Waterways Project, Victoria River Catchment, Northern Territory Surface Water Management Areas, Drainage Divisions and Basins Map, Figure 20. It is located just outside (south) of the boundary for the Darwin Rural Water Control District, Figure 21, which is the area designated for surface water and groundwater management purposes.



This map should be read in conjunction with the report: Kirby, S.L. and Faulks, J.J. (2004) *Victoria River Catchment - An Assessment of the Physical and Ecological Condition of the Victoria River and its Major Tributaries* Tech. Report No 40/2004K, Dept Infrastructure, Planning and Environment Katherine, Northern Territory.

★ Baseline data collected for Top End Waterways Project (1995 - 1997)
▲ Baseline data collected for Top End Waterways Project Mark 2 (1998 - 1999)

Surface Water Management Area boundaries were developed by the National Land and Water Resources Audit (NLWRA) and distributed by Geoscience Australia, National Mapping Division © Commonwealth of Australia, 2001



TOP END WATERWAYS PROJECT
VICTORIA RIVER CATCHMENT

NORTHERN TERRITORY
SURFACE WATER MANAGEMENT AREAS
(Drainage Divisions and Basins)

Map 1

Figure 20: Northern Territory Surface Water Management Areas (Drainage Divisions and Basins. Developed by the National Land and Water Resources Audit (NLWRA).

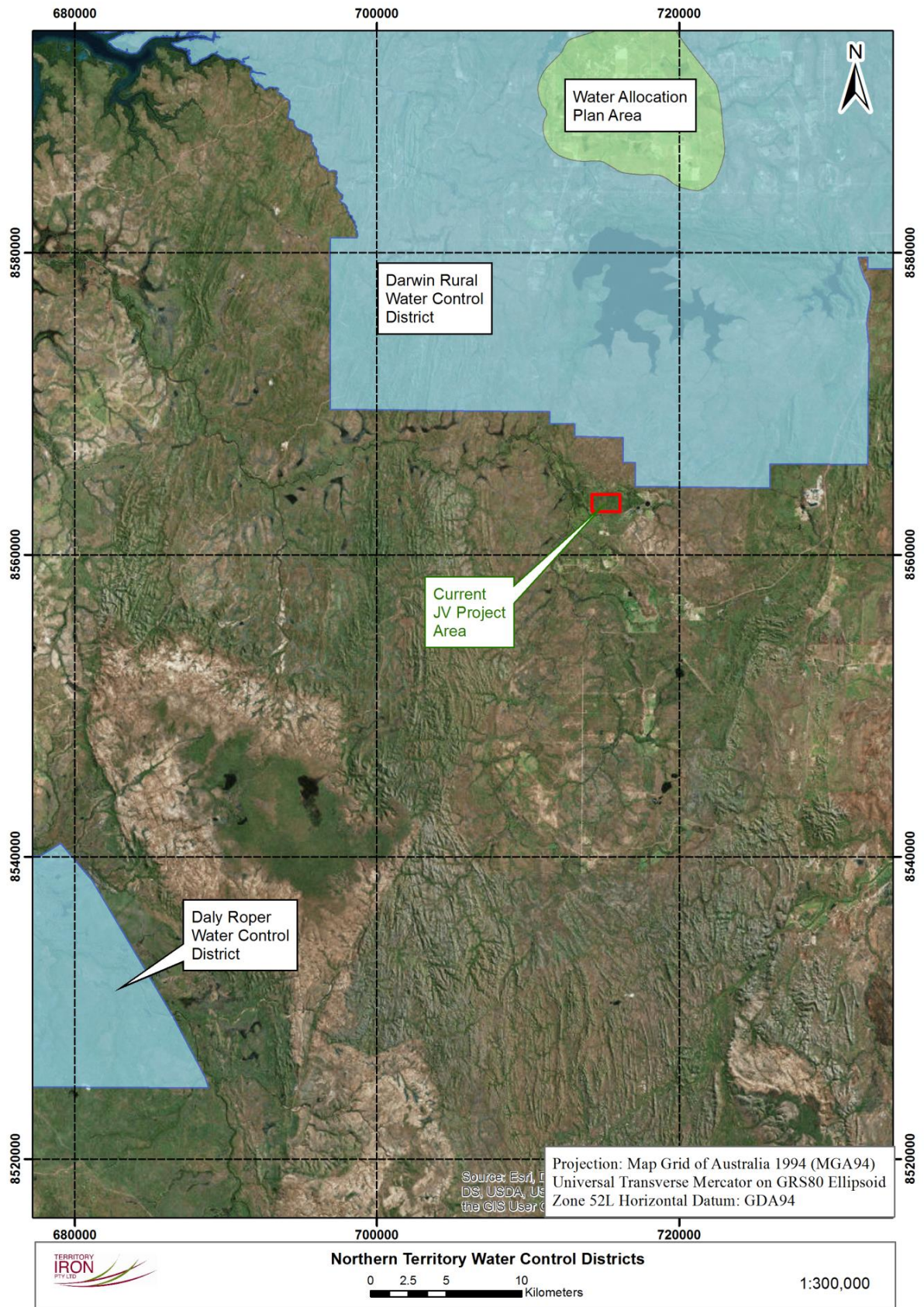


Figure 21: Northern Territory Water Control Districts. ESRI world satellite imagery defines background relief

Water bore locations in the Rum Jungle area are shown in Figure 22, the data sourced from NR Maps <http://nrmaps.nt.gov.au/?jsessionid=xkhvlnwoe8xevt3iwev93i>.

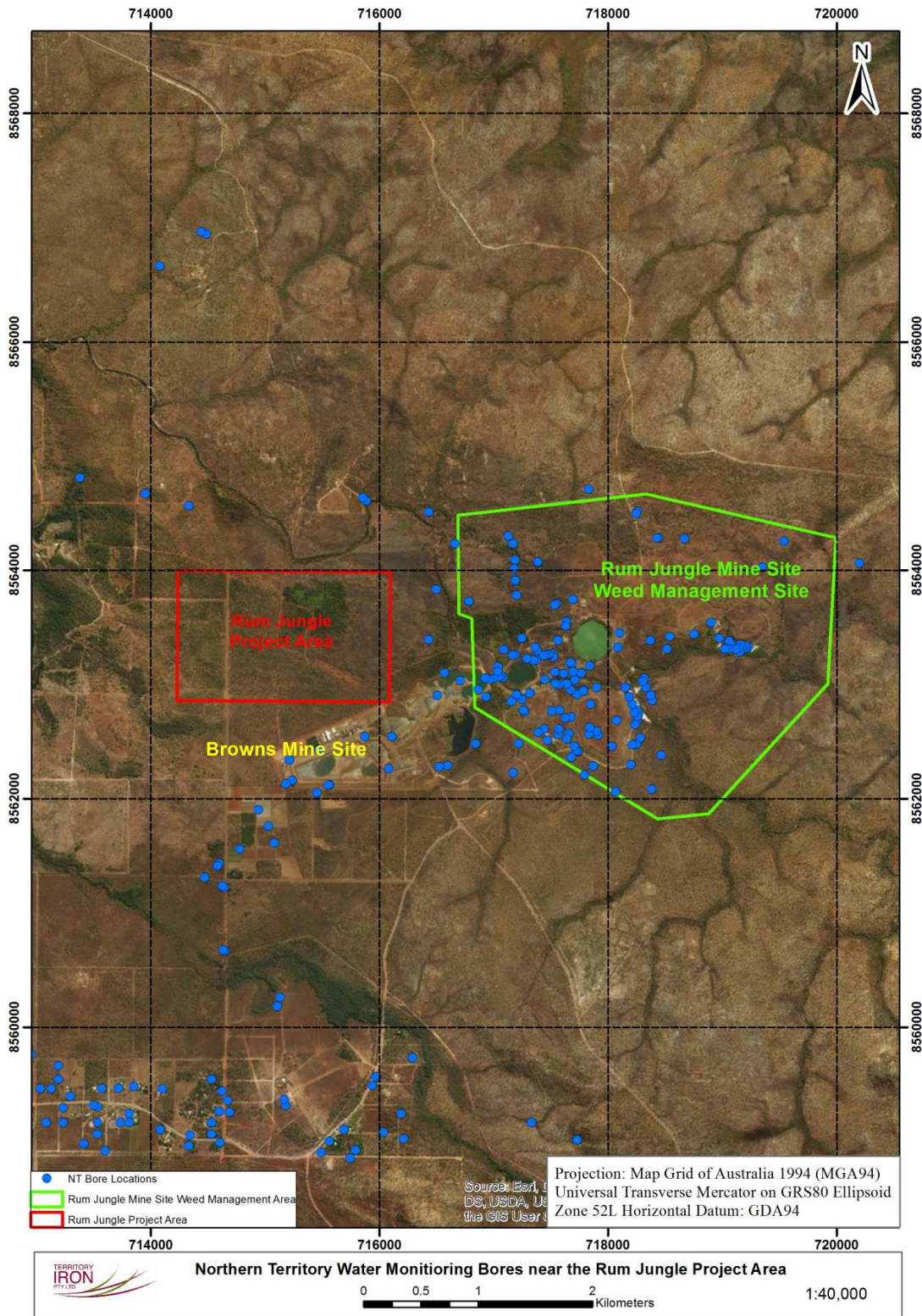


Figure 22: Northern Territory water bore locations near the Rum Jungle Project Area. The majority of water bore data is located close to the old Rum Jungle and Browns mine site and not within the Rum Jungle Project Area itself. ESRI world satellite imagery defines background relief

The majority of the available water bore data are sourced from the adjacent historic Rum Jungle mine and also the Browns mine site to the south of the project area. Although there are no water bore data for the project area, data from nearby bores not associated with earlier mining activities are shown in Table 6, Figure 23 and reports in **Appendix IV**.

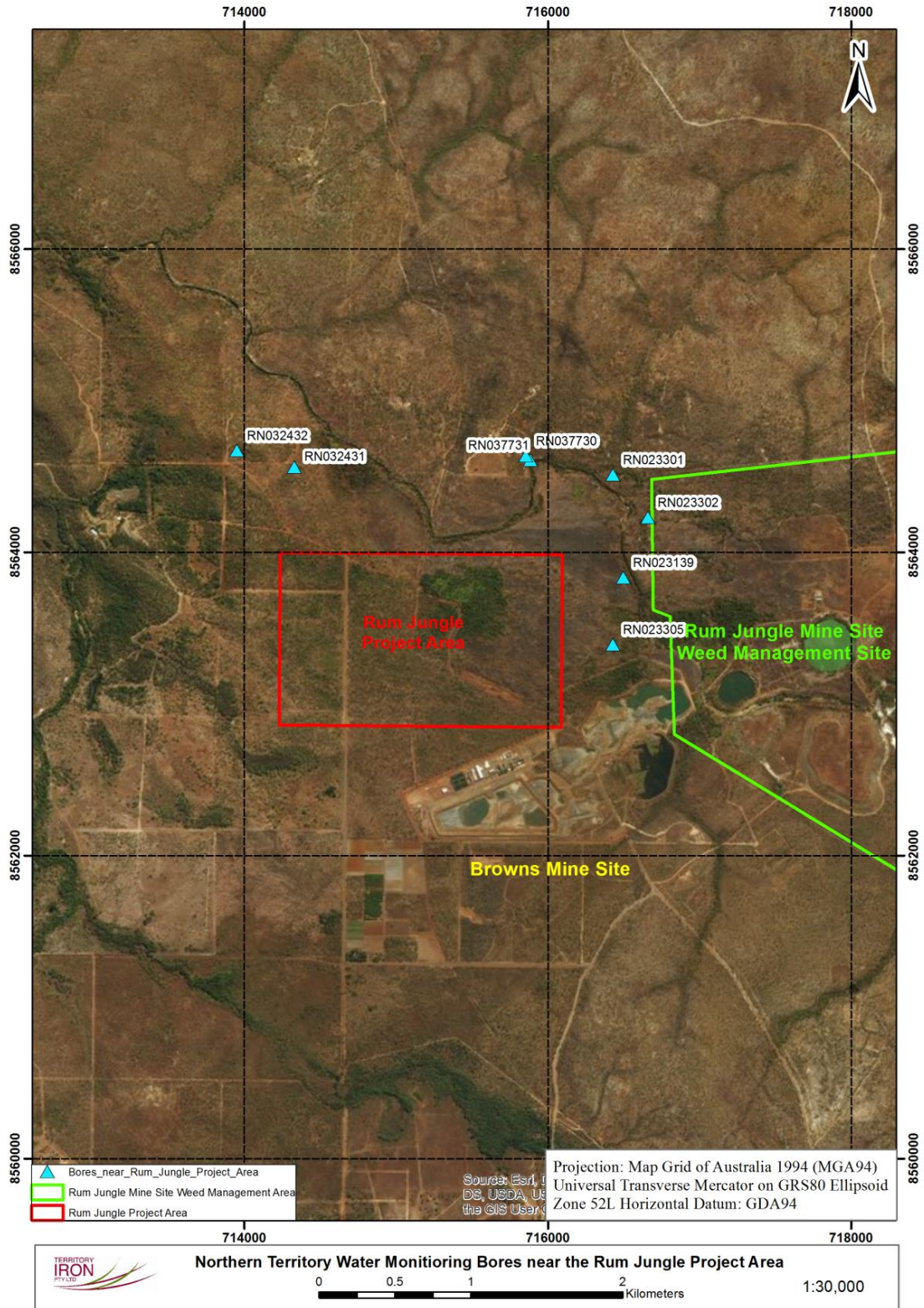


Figure 23: Location of water bores proximal to the Rum Jungle Project Area. ESRI world satellite imagery defines background relief

Table 6: Summary of water bore data from locations adjacent to the Rum Jungle Project Area

Water Bore Data Adjacent to Rum Jungle Project Area						
Bore	Depth from (m)	Depth to (m)	Lithology	Water Table (m)	Standing Water Level (m)	Discharge l/sec
RN023129	0	63	Laterite, quartz, hematite, minor red sandstone	13.73	6.6	0.1
RN023301	0	24	Laterite, quartz, grey-yellow clay, amphibolite			
RN023302	0	12	Laterite, clay, quartz, weathered tremolite schist	9.5	4.8	1.1
RN023305	0	41.5	Laterite, quartz, sandstone, magnetite			
RN032431	0	36	Red soil, weathered granite			
RN032432	0	37	Clay, quartz, clay, gravel	26-35	16	6
RN037730	0	6.9	Saprolite			
RN037731	0	30.1	Soil, saprolite, Rum Jungle Complex (granitoid)	12-30		0.2

A number of reports have been commissioned relating to hydrogeology and groundwater systems of the Rum Jungle and Brown's Oxide areas. A Coffey report for ENESAR Consultants (2005) provides a groundwater assessment of the area that is considered relevant to the Rum Jungle project area. Other reports include (Mudd and Patterson 2008; CSIRO, 2009; Robertson GeoConsultants, 2010; Water Studies Pty Ltd, 2000 and the CSIRO North Australia Land and Water Science Review, weblink: <https://www.csiro.au/en/Research/Major-initiatives/Northern-Australia/Achievements/Science-Review-2009>).

The Rum Jungle Project area appears to be characterised by complex aquifer and groundwater systems, including shallow and deep aquifers that have a level of connectivity. Historic research of the area indicates the aquifers are unconfined and show variation in water pressure and groundwater yields. For future exploration activities, should any drill holes intersect an aquifer, then they will be capped with specialised concrete plugs, as per the NT DPIR aa7-029 Construction and Rehabilitation of Exploration Drill Sites instruction sheet.

4.3 FLORA AND FAUNA

4.3.1 FLORA

A comprehensive ecological report for the Rum Jungle Project Area was undertaken by Hanrahan *et al.*, 2012 and the full report is located in **Appendix III**. Vegetation communities are diverse within the project area and include monsoon vine forest, Northern cane grass grasslands, open Eucalypt forest and a riparian floodplain. The area in general is dominated by Eucalypt tall open forests including the Darwin Woollybutt (*Eucalyptus miniata*) and Darwin Stringybark (*Eucalyptus tetradonta*; Hanrahan *et al.*, 2012; **Appendix III**). Other species include *Eucalyptus grandifolia*, *Eucalyptus latifolia*, *Eucalyptus tintinnans*, *Corymbia confertiflora* and *Eucalyptus tectifera*. The monsoon vine forest has an emergent tree layer of *Mimusops elengii*, *Diospyros sp.*, *Sersalisia sericea*, *Celtis phillippensis*, strangler fig (*Ficus virens*) and sandpaper fig (*Ficus scabina*). Native bamboo (*Bambusa arnhemica*) occurs on the margins of the monsoon vine forest (Hanrahan *et al.*, 2012). Recorded vine species by Hanrahan *et al.*, 2012, included the snake vine (*Tinaspora smilliicina*), *Amorphophallus paeonifolius* and wild grape (*Ampelacissus acetosa*).

The NT NRM Report Rum Jungle (**Appendix III**) indicates that the Rum Jungle Project area is too small to produce reliable statistics regarding an accurate assessment of vegetation type. Fifty-five species were documented within the Monsoon Vine Forest (Site 1) and three just outside the project area, Site 2, Figure 24. Vegetation listed as threatened species in the NT Rum Jungle NRM Report (**Appendix III**) include Armstrong's Cycad, *Cycas armstrongii* and Bladderwort, *Utricularia dunstaniae* and *Utricularia singeriana*, Table 8. *Cycas armstrongii* is listed as a vulnerable species in the Top End of the Northern Territory and is widespread at low density in some areas of the project area. Territory Resources recognizes the importance of protecting this species, and will restrict clearing and land disturbance where these plants are found.

Table 7: NR Maps Flora Atlas sightings for Rum Jungle Project

Site Code	Genus	Species
Doc8 Rum Jung	<i>Clematis</i>	<i>pickeringii</i>
Doc8 Rum Jung	<i>Litsea</i>	<i>glutinosa</i>
Doc8 Rum Jung	<i>Bambusa</i>	<i>arnhemica</i>
Doc8 Rum Jung	<i>Strychnos</i>	<i>lucida</i>
Doc8 Rum Jung	<i>Embelia</i>	<i>curvinervia</i>
Doc8 Rum Jung	<i>Miliusa</i>	<i>traceyi</i>
Doc8 Rum Jung	<i>Grewia</i>	<i>breviflora</i>
Doc8 Rum Jung	<i>Marsdenia</i>	<i>velutina</i>
Doc8 Rum Jung	<i>Terminalia</i>	<i>microcarpa</i>
Doc8 Rum Jung	<i>Canarium</i>	<i>australianum</i>
Doc8 Rum Jung	<i>Clerodendrum</i>	<i>costatum</i>
Doc8 Rum Jung	<i>Dioscorea</i>	<i>transversa</i>
Doc8 Rum Jung	<i>Ficus</i>	<i>scobina</i>
Doc8 Rum Jung	<i>Pouteria</i>	<i>sericea</i>
Doc8 Rum Jung	<i>Ixora</i>	<i>timorensis</i>
Doc8 Rum Jung	<i>Miliusa</i>	<i>brahei</i>
Doc8 Rum Jung	<i>Diospyros</i>	<i>rugosula</i>
Doc8 Rum Jung	<i>Breynia</i>	<i>cernua</i>
Doc8 Rum Jung	<i>Synedrella</i>	<i>nodiflora</i>
Doc8 Rum Jung	<i>Acacia</i>	<i>auriculiformis</i>
Doc8 Rum Jung	<i>Mallotus</i>	<i>philippensis</i>
Doc8 Rum Jung	<i>Glochidion</i>	<i>xerocarpum</i>
Doc8 Rum Jung	<i>Opilia</i>	<i>amentacea</i>
Doc8 Rum Jung	<i>Psychotria</i>	<i>nesophila</i>
Doc8 Rum Jung	<i>Adenia</i>	<i>heterophylla</i>
Doc8 Rum Jung	<i>Ichnocarpus</i>	<i>frutescens</i>
Doc8 Rum Jung	<i>Smilax</i>	<i>australis</i>
Doc8 Rum Jung	<i>Sterculia</i>	<i>quadrifida</i>
Doc8 Rum Jung	<i>Urena</i>	<i>lobata</i>
Doc8 Rum Jung	<i>Glochidion</i>	<i>apodogynum</i>
Doc8 Rum Jung	<i>Canavalia</i>	<i>papuana</i>
Doc8 Rum Jung	<i>Ganophyllum</i>	<i>falcatum</i>
Doc8 Rum Jung	<i>Flueggea</i>	<i>virosa</i>
Doc8 Rum Jung	<i>Abrus</i>	<i>preparatorius</i>
Doc8 Rum Jung	<i>Jacquemontia</i>	<i>paniculata</i>
Doc8 Rum Jung	<i>Stephania</i>	<i>japonica</i>
Doc8 Rum Jung	<i>Helicteres</i>	<i>isora</i>
Doc8 Rum Jung	<i>Diospyros</i>	<i>compacta</i>
Doc8 Rum Jung	<i>Allophylus</i>	<i>cobbe</i>
Doc8 Rum Jung	<i>Ficus</i>	<i>virens</i>
Doc8 Rum Jung	<i>Cissus</i>	<i>adnata</i>
Doc8 Rum Jung	<i>Alstonia</i>	<i>actinophylla</i>
Doc8 Rum Jung	<i>Adiantum</i>	<i>philippense</i>
Doc8 Rum Jung	<i>Micromelum</i>	<i>minutum</i>
Doc8 Rum Jung	<i>Cupaniopsis</i>	<i>anacardioides</i>
Doc8 Rum Jung	<i>Exocarpos</i>	<i>latifolius</i>
Doc8 Rum Jung	<i>Trema</i>	<i>tomentosa</i>
Doc8 Rum Jung	<i>Dioscorea</i>	<i>bulbifera</i>
Doc8 Rum Jung	<i>Myristica</i>	<i>insipida</i>
Doc8 Rum Jung	<i>Capparis</i>	<i>sepiaria</i>
Doc8 Rum Jung	<i>Denhamia</i>	<i>obscura</i>
Doc8 Rum Jung	<i>Drypetes</i>	<i>deplanchei</i>
Doc8 Rum Jung	<i>Passiflora</i>	<i>foetida</i>
Doc8 Rum Jung	<i>Polyalthia</i>	<i>australis</i>
Doc8 Rum Jung	<i>Flacourtia</i>	<i>territoralis</i>
No site code	<i>Eleutheranthera</i>	<i>ruderalis</i>
No site code	<i>Ageratum</i>	<i>conyzoides</i>
No site code	<i>Canavalia</i>	<i>papuana</i>

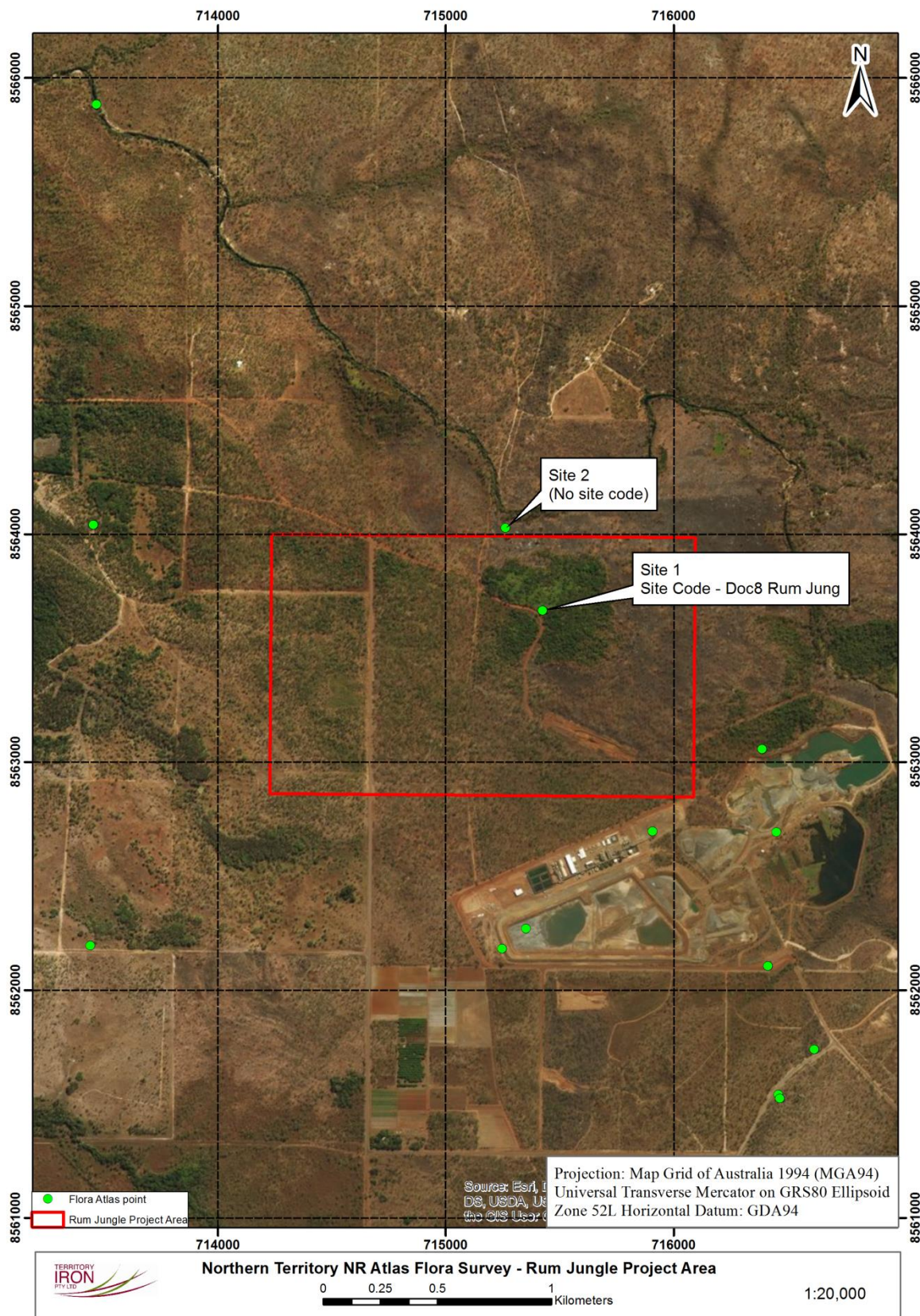


Figure 24: Northern Territory Flora Atlas locations - Rum Jungle Project Area. Source of data - Northern Territory NR Maps. Esri world imagery defines background relief.

Table 8: Threatened plant species identified within the Rum Jungle Project Area – source: NT Rum Jungle NRM Report

Common Name	Scientific Name	Northern Territory Status
Armstrong's Cycad	<i>Cycas armstrongii</i>	Vulnerable
Bladderwort	<i>Utricularia dunstaniae</i>	Vulnerable
Bladderwort	<i>Utricularia singeriana</i>	Vulnerable

*Note species in the above table were sourced from a wider distribution than the project area

4.3.2 FAUNA

Hanrahan *et al.*, (2012) conducted a four day/three night environmental survey within the project area in February 2012. The full report is located in **Appendix III**. The results of their survey indicated that faunal species of conservation significance were not identified.

The Rum Jungle Project Area however, may potentially include a number of significant fauna (Hanrahan *et al.*, 2012; **Appendix III**). Mammals which *potentially could be present* include the Bare-rumped Sheathtail Bat (*Saccolaimus saccolaimus nudicluniatus*), Brush-tailed Tree-rat (*Conilurus penicillatus*), Northern Quoll (*Dasyurus hallucatus*), Northern Brush-tailed Phascogale (*Phascogale pirate*) and False Water Rat (*Xeromy myoides*). Significant birds which may be present include the Goudian Finch (*Erythrura gouldiae*), Partridge Pigeon (*Geophaps smithii smithii*), Masked Owl (*Tyto novaehollandiae kimberli*) and the Red Goshawk (*Erythrotriorchis radiates*). The Freshwater Sawfish (*Pristis micradon*) may also be present.

It is important to note that the species listed above *were not* directly observed by Hanrahan *et al.*, (2012) during their 2012 environmental survey in the project area, but was the result of an online Environment Protection Biodiversity Conservation (EPBC) Protected Matters Search which indicated that they are likely to occur in the general area.

A fauna trapping programme was undertaken by Hanrahan *et al.*, (2012) and species captured include the Pale Field Rat (*Rattus tunneyi*) Two-lined Dragon (*Diporiphora bilineata*) *Carlia sp.* and a bat (*Scotorepens sp.*). Thirty-nine bird species were also identified.

Data download associated with the NT NRM Report for the Rum Jungle Project Area are located in **Appendix III**. The NT NRM Report Rum Jungle (**Appendix III**) indicates that the project area is too small to produce reliable statistics regarding an accurate assessment of fauna distribution. However, data from the Fauna Atlas downloaded from NT NR Maps is shown in Table 9, Figure 25 and the data in Excel format in **Appendix V**.

Table 9: NR Maps Fauna Atlas data for the Rum Jungle Exploration Project

Common Name	Scientific Name	Common Name	Scientific Name
Agile Wallaby	<i>Macropus agilis</i>	Northern Water Dragon	<i>Lophognathus temporalis</i>
Antilopine Wallaroo	<i>Macropus antilopinus</i>	Olive-backed Oriole	<i>Oriolus sagittatus</i>
Arafura Fantail	<i>Rhipidura dryas</i>	Orange-footed Scrubfowl	<i>Megapodius reinwardt</i>
Australasian Figbird	<i>Sphecothebes vieilloti</i>	Pacific Baza	<i>Aviceda subcristata</i>
Banded Honeyeater	<i>Cissomela pectoralis</i>	Peaceful Dove	<i>Geopelia striata</i>
Bar-shouldered Dove	<i>Geopelia humeralis</i>	Pheasant Coucal	<i>Centropus phasianinus</i>
Black Kite	<i>Milvus migrans</i>	Pied Butcherbird	<i>Cracticus nigrogularis</i>
Black-chinned Honeyeater	<i>Melithreptus gularis</i>	Pied Imperial-Pigeon	<i>Ducula bicolor</i>
Black-faced Cuckoo-shrike	<i>Coracina novaehollandiae</i>	Rainbow Bee-eater	<i>Merops ornatus</i>
Black-tailed Treecreeper	<i>Climacteris melanura</i>	Rainbow Lorikeet	<i>Trichoglossus haematodus</i>
Blue-faced Honeyeater	<i>Entomyzon cyanotis</i>	Rainbow Pitta	<i>Pitta iris</i>
Blue-winged Kookaburra	<i>Dacelo leachii</i>	Red-backed Fairy-wren	<i>Malurus melanocephalus</i>
Brown Honeyeater	<i>Lichmera indistincta</i>	Red-tailed Black-cockatoo (Top End)	<i>Calyptrorhynchus banksii macrorhynchus</i>
Brush Cuckoo	<i>Cacomantis variolosus</i>	Red-winged Parrot	<i>Aprosmictus erythropterus</i>
Cane Toad	<i>Rhinella marina</i>	Robust Ctenotus	<i>Ctenotus robustus</i>
Cat	<i>Felis catus</i>	Rose-crowned Fruit-dove	<i>Ptilinopus regina</i>
Channel-billed Cuckoo	<i>Scythrops novaehollandiae</i>	Rufous Whistler	<i>Pachycephala rufiventris</i>
Chestnut-breasted Mannikin	<i>Lonchura castaneothorax</i>	Rufous Whistler	<i>Pachycephala rufiventris</i>
Common Bronzewing	<i>Phaps chalcoptera</i>	Rufous-banded Honeyeater	<i>Conopophila albogularis</i>
Crimson Finch	<i>Neochmia phaeton</i>	Sacred Kingfisher	<i>Todiramphus sanctus</i>
Dingo	<i>Canis lupus</i>	Silver-crowned Friarbird	<i>Philemon argenticeps</i>
Dollarbird	<i>Eurystomus orientalis</i>	Slender Rainbow Skink	<i>Carlia gracilis</i>
Dusky Honeyeater	<i>Myzomela obscura</i>	Southern Boobook	<i>Ninox novaeseelandiae</i>
Eastern Koel	<i>Eudynamys orientalis</i>	Spangled Drongo	<i>Dicrurus bracteatus</i>
Echidna	<i>Tachyglossus aculeatus</i>	Straw-necked Ibis	<i>Threskiornis spinicollis</i>
Elegant Imperial-Pigeon	<i>Ducula concinna</i>	Striped Rainbow Skink	<i>Carlia munda</i>
Emerald Dove	<i>Chalcophaps indica</i>	Sulphur-crested Cockatoo	<i>Cacatua galerita</i>
Gilbert's Dragon	<i>Lophognathus gilberti</i>	Two-Lined Dragon	<i>Diporiphora bilineata</i>
Glossy Ibis	<i>Plegadis falcinellus</i>	Two-Spined Rainbow Skink	<i>Carlia amax</i>
Grassland Melomys	<i>Melomys burtoni</i>	Varied Lorikeet	<i>Psittuteles versicolor</i>
Great Bowerbird	<i>Ptilonorhynchus nuchalis</i>	Varied Triller	<i>Lalage leucomela</i>
Grey Butcherbird	<i>Cracticus torquatus</i>	Whistling Kite	<i>Haliastur sphenurus</i>
Grey Fantail	<i>Rhipidura albiscapa</i>	White-bellied Cuckoo-shrike	<i>Coracina papuensis</i>
Grey Shrike-thrush	<i>Colluricincla harmonica</i>	White-gaped Honeyeater	<i>Lichenostomus unicolor</i>
Helmeted Friarbird	<i>Philemon buceroides</i>	White-throated Gerygone	<i>Gerygone albogularis</i>
Large-billed Gerygone	<i>Gerygone magnirostris</i>	White-throated Honeyeater	<i>Melithreptus albogularis</i>
Large-tailed Nightjar	<i>Caprimulgus macrurus</i>	Willie Wagtail	<i>Rhipidura leucophrys</i>
Leaden Flycatcher	<i>Myiagra rubecula</i>	Yellow Oriole	<i>Oriolus flavocinctus</i>
Little Corella	<i>Cacatua sanguinea</i>	Yellow-rumped Mannikin	<i>Lonchura flaviprymna</i>
Little Friarbird	<i>Philemon citreogularis</i>	Yellow-throated Miner	<i>Manorina flavigula</i>
Magpie-lark	<i>Grallina cyanoleuca</i>		<i>Ducula sp</i>
Mistletoebird	<i>Dicaeum hirundinaceum</i>		<i>Myiagra sp</i>
Northern Fantail	<i>Rhipidura rufiventris</i>		<i>Eudynamys sp</i>
Northern Rosella	<i>Platycercus venustus</i>		<i>Lichenostomus sp</i>
Northern Small-eyed Snake	<i>Cryptophis pallidiceps</i>		

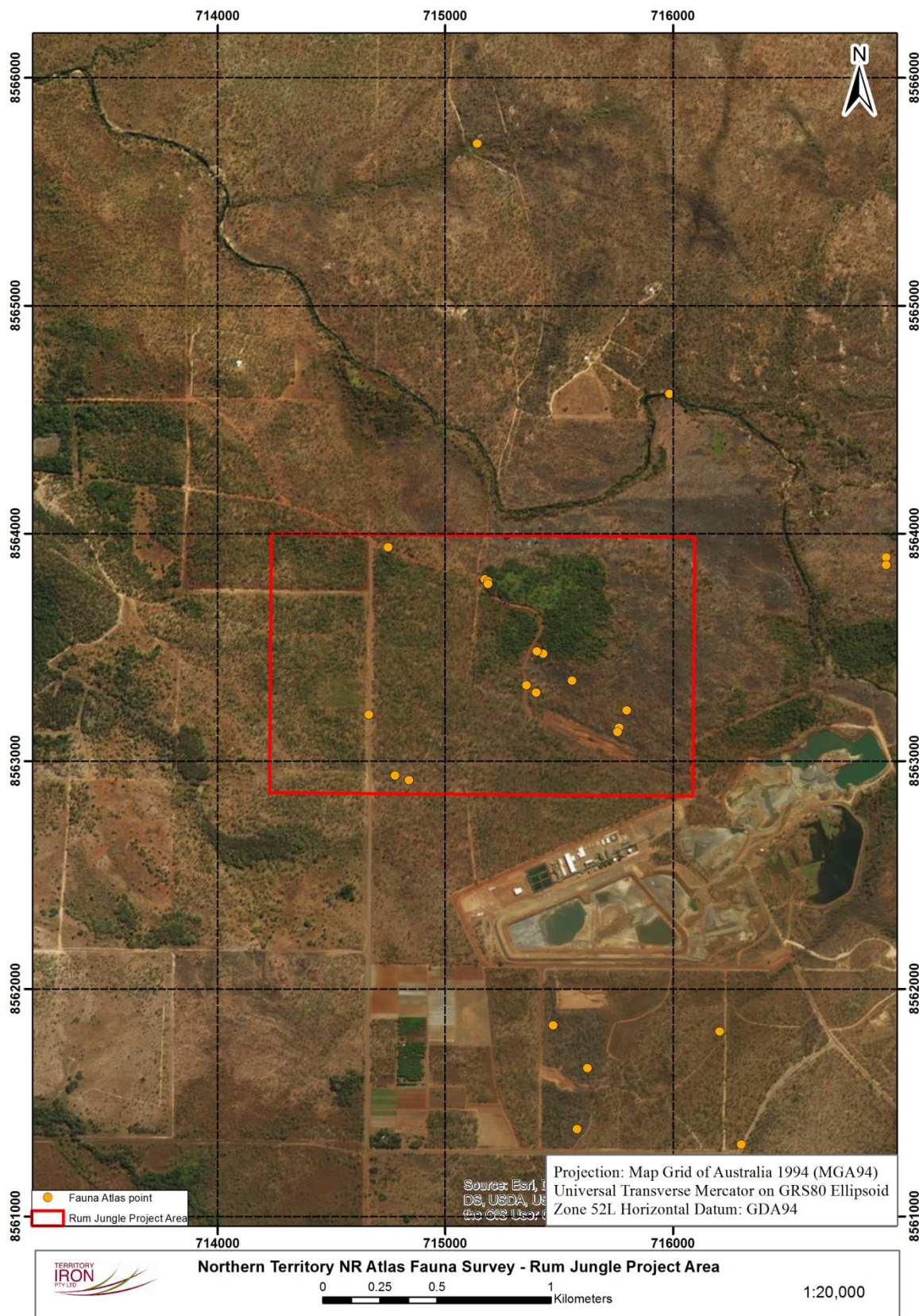


Figure 25: Northern Territory Fauna Atlas locations - Rum Jungle Project Area. Source of data - Northern Territory NR Maps. Esri world imagery defines background relief.

Table 10: Threatened species identified within the Rum Jungle Project Area

Common Name	Scientific Name	Northern Territory Status
Mertens' Water Monitor	<i>Varanus mertensi</i>	Vulnerable
Mitchell's Water Monitor	<i>Varanus mitchelii</i>	Vulnerable
Partridge Pidgeon	<i>Geophaps smithii</i>	Vulnerable
Red Goshawk	<i>Erythrolnorchis radiatus</i>	Vulnerable
Goudian Finch	<i>Erythrura gouldiae</i>	Vulnerable
Northern Quoll	<i>Dasyurus hallucalus</i>	Vulnerable
Fawn Antechinus	<i>Antechinus hellus</i>	Endangered
Black-footed Tree rat	<i>Mesembriomys gouldii gouldii</i>	Vulnerable
Pale Field rat	<i>Rattus tunneyi</i>	Vulnerable

4.4 LAND USE

The project area partly overlies Aboriginal Freehold Land and partly overlies Freehold Land owned by stakeholders, Figure 6. They are as follows:

- Finniss River Aboriginal Land Trust
- NT Land Corporation (Sections 02954 and 02955 Hundred of Goyder)
- Percy Evan Kean (deceased) now Michael Kean - Sections 00982, 02943 and 02949 Hundred of Goyder
- Margaret Joan Kerle (Sections 00996 and 00997 Hundred of Goyder).

Territory Resources has a Land Access Agreement with freehold owner Mr Kean. For the 2014 drill programme, the NT Land Corporation accepted the Territory Resources work programme and several meetings with the Finniss River Aboriginal Land Trust have taken place, facilitated by the NLC.

4.5 HERITAGE SITES

Territory Resources acts in compliance with the NT *Sacred Sites Act* 1989 and NT *Heritage Act* 2012. Prior to 2015, Territory Resources had an Indigenous, Heritage and Community Affairs Department which employed two permanent Archaeologists and when required, a consulting Archaeologist. During the active exploration stage, the Archaeologists were in contact with representatives of the Finniss River Aboriginal Land Trust.

Territory Resources commissioned an Archaeological and Heritage assessment of the project area in 2012 (Martin-Stone, 2012; **Appendix III**). The survey was undertaken to identify sites of cultural and heritage significance prior to Territory Resources initiating a drill programme. As a result of the survey, one stone artefact scatter and seven culturally modified trees were identified and these are recorded as site centroids, Figure 26. For artefact scatter sites, centroids are the centre point for a number of recorded artefacts and are not representative of the entire area. In addition, a historical rail line bisects the project area from north to south, Figure 26. These sites are protected under the NT *Heritage Conservation Act (1991)* and recorded sites are lodged with the Northern Territory Heritage Branch, Department of Lands, Planning and the Environment.

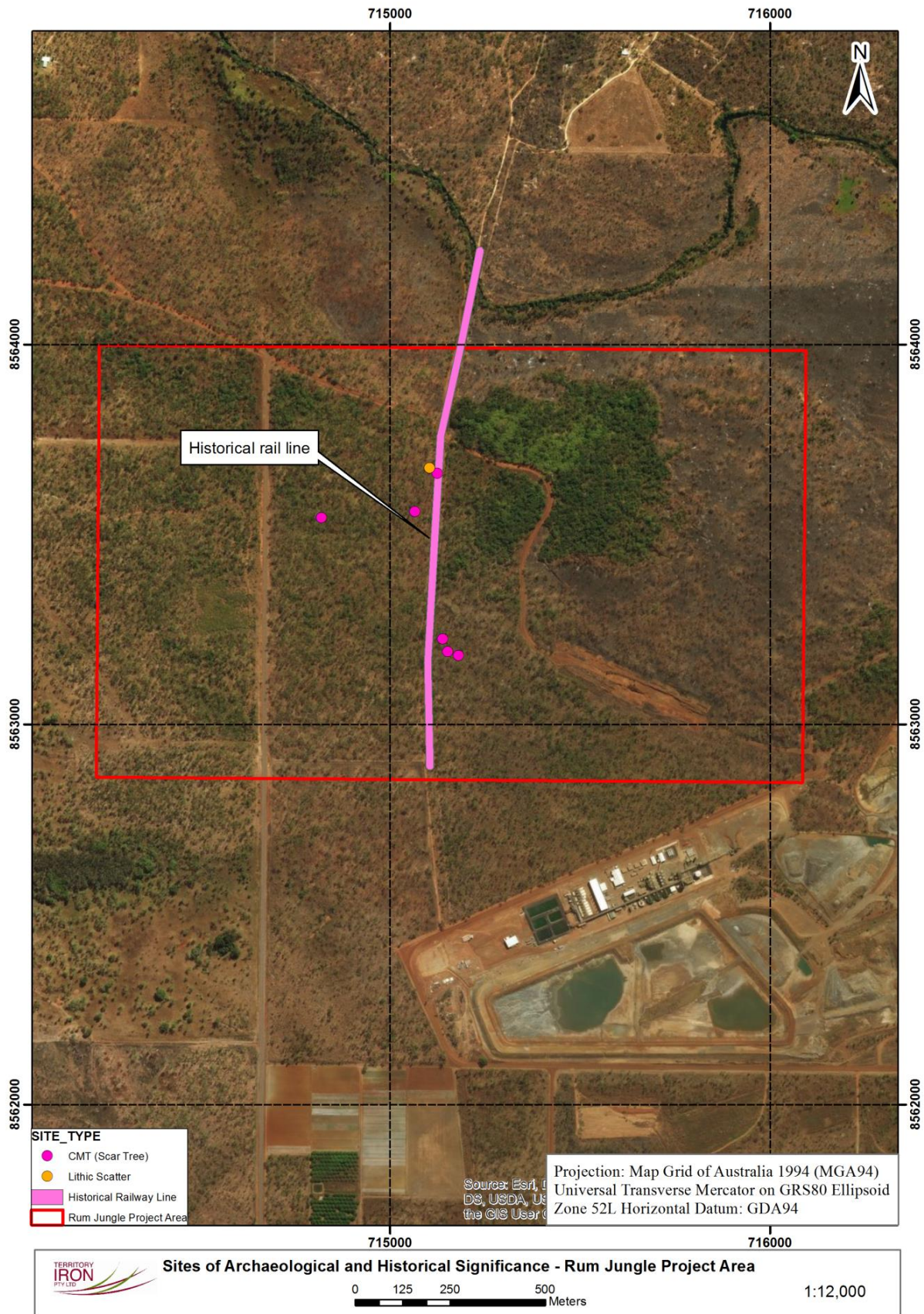


Figure 26: Sites of Archaeological and Historical Significance. Esri world imagery defines background relief.

5.0 ENVIRONMENTAL MANAGEMENT SYSTEM

5.1 ENVIRONMENTAL POLICY AND RESPONSIBILITIES

Territory Resources has implemented strategies designed to minimize the potential impact to the environment directly relating to exploration activities. These include utilizing existing tracks where possible in preference to constructing new tracks, keeping the track width to a minimum and constructing new tracks along topographic contours, minimising the disturbance of significant vegetation (e.g. avoiding large trees and *Cycas armstrongii*) and avoiding watercourses. Preservation of large trees is important as they are often sites for nesting. Moreover, all Territory Resources staff and contractors undergo a site induction which highlights endangered flora/fauna and the importance to minimise environmental disturbance at all times.

Land disturbance (drill pad sites and tracks) are designed to avoid riparian environments and associated low-lying alluvial areas. Buffer zones of 50 metres are used to avoid damage to the fringing vegetation at the interface between the land and a river or stream. This practice ensures the ecological integrity and biodiversity of permanent and ephemeral watercourses and associated vegetation are preserved. During track construction, watercourse crossings are designed to minimise disturbance to natural water flow. In addition, it is standard practice for Territory Resources staff and contractors to design tracks around large or significant trees to ensure their preservation.

All Territory Resources personnel take responsibility for the implementation of environmental practices and these measures were monitored by senior staff members. All personnel associated with the exploration program (including contractors) are aware and responsible for their own actions and how that may negatively impact on the environment. Current Territory Iron personnel take environmental issues seriously and work hard to minimise unnecessary disturbance to the environment.

An earlier version of Territory Iron's Environmental Policy (*as of 2013*) is presented on the next page. Territory Iron is currently re-evaluating the Environmental Policy and once finalised and signed by the General Manager, will be submitted as an amendment to this Progressive Remediation Report.

Please note that Territory Iron Pty Ltd is a 100% subsidiary (wholly owned) of Territory Resources Ltd.



Environmental Policy

Territory Iron Pty Limited believes that protection of the environment is a key responsibility. Company management recognises that environmental management is an integral part of all activities, from exploration and mining to processing and exporting. Maintaining a high level of environmental performance at our operations will benefit all stakeholders, including shareholders, employees, Traditional Owners and the broader community.

In order to achieve and maintain high environmental standards, Territory Iron Pty Limited and its employees undertake to:

- *Comply with all applicable environmental laws, regulations and standards;*
- *Implement systems to identify, control and monitor environmental risks arising from our operations;*
- *Cooperate with regulators and stakeholders in the development of standards that improve protection of the environment and the community;*
- *Implement strategies, methods and technologies to prevent pollution, minimise waste and conserve natural resources;*
- *Ensure that all company employees and contractors are aware of their environmental responsibilities and conduct operational activities, including appropriate environmental controls, with a high level of competence;*
- *Promote cross cultural awareness and where possible, protect sites of cultural and heritage significance;*
- *Engage in timely and effective communication with landowners, relevant Indigenous people and others who may be directly affected by Company operations;*
- *Communicate regularly with employees, suppliers, contractors and customers about the objectives of the Company environmental policy and its implied responsibilities;*
- *Provide information to the community, shareholders and regulatory authorities regarding the environmental performance of the Company; and*
- *Continually seek to improve Company environmental performance.*

Authorised by:

Darren Gibcus
General Manager - Operations
10 August 2013

5.2 STATUTORY AND NON-STATUTORY REQUIREMENTS

5.2.1: STATUTORY REQUIREMENTS

The Rum Jungle Project Area is subject to the following statutory requirements.

- Mining Management Act 2013
- Mineral Titles Act 2011
- Heritage Act 2011
- Northern Territory Aboriginal Sacred Sites Act 1989
- Commonwealth Native Title Act 1993
- Commonwealth Environment Protection and Biodiversity Conservation Act 1999
- Northern Territory Environmental Assessment Act 1994
- Bushfires Act 2009 (subject to permits from Bushfires NT)
- Weeds Management Act 2001
- Environmental Protection and Biodiversity Conservation Act 1999
- Environmental Assessment Act 1992
- Pastoral Lands Act
- Work, Health and Safety Act (National Uniform Legislation) Act 2011

5.2.2 NON-STATUTORY REQUIREMENTS

5.2.2.1 Land Use Agreements – Native Title

Prior to the last drill programme in 2014, Territory Resources Archaeologists engaged with the Finnis River Aboriginal Land Trust in a number of meetings facilitated by the Northern Land Council (NLC) to ensure the protection of indigenous interests in the project area. No drill programmes are planned for the immediate future.

5.2.2.1 Land Tenure

There are four freehold land holders affected by the proposed Exploration drilling works.

- Finnis River Aboriginal Land Trust
- NT Land Corporation (Sections 02954 and 02955 Hundred of Goyder)
- PE Kean (now managed by M Kean) - Sections 00982, 02943 and 02949 Hundred of Goyder
- MJ Kerle (Sections 00996 and 00997 Hundred of Goyder).

Territory Resources has a Land Access Agreement with M Kean signed in 2012. M Kerle however declined to enter into a formal agreement with Territory Resources and will provide verbal permission for land access when required.

5.3 INDUCTION AND TRAINING

All Territory Resources personnel and contractors must comply with all applicable Environmental and Heritage laws, Regulations and Standards and ensure that they are aware of their Environmental and Heritage responsibilities and obligations. To meet these objectives, all personnel and contractors undertake a half-hour site induction prior to work engagement.

The induction training includes:

- Environmental and heritage policy and commitments
- Environmental and heritage setting
- Environmental monitoring
- Cultural heritage management practices
- Land disturbance
- Rehabilitation

-
- Flora and fauna (including threatened species, feral animals and weed identification and management)
 - Waste management
 - Environmental spills/accidents
 - Effects of uncontrolled burns
 - Safety

Contract service companies are required to demonstrate that they have a Safety Management Plan (SMP) in place. It is the duty of the onsite contractor's supervisor to implement, monitor and meet the requirements under their SMP. Any potential hazard identified by Territory Resources personnel or any other contractor is integrated into the Territory Resources hazard identification/mitigation process and remedial actions implemented and documented. During the active exploration phase, Territory Resources played an active role in assisting contract service companies in refining and improving their Standard Operating Procedures (SOPs).

5.4 IDENTIFICATION OF ENVIRONMENTAL ASPECTS AND IMPACTS

Prior to any land disturbing exploration activity, an internal Territory Iron Land Disturbance Permit (LDP) was required to be completed by the Exploration, Community and Heritage and Environmental Departments prior to approval by management. The LDP served to protect any identified significant cultural heritage sites and/or endangered flora and fauna which required isolation and protection.

Land disturbance (drill pad sites and tracks) are designed to avoid riparian environments and associated low-lying alluvial areas. Buffer zones of 50 metres are used to avoid damage to the fringing vegetation at the interface between the land and a river or stream. This practice ensures the ecological integrity and biodiversity of permanent and ephemeral watercourses and associated vegetation are preserved. In addition, during track construction, it is standard practice for Territory Resources staff and contractors to design tracks around large or significant trees to ensure their preservation.

Vehicles used by staff are located at the Territory Resources (Territory Iron) Frances Creek mine site. A vehicle wash down area (high pressure hose) is located at the mine site and vehicles are washed regularly to prevent the spread of invasive weeds (seeds) and to maintain cleanliness. It is standard practice for vehicles to be routinely washed if they have been in areas away from the Frances Creek Project area or are used to visit another area away from Frances Creek. All contract personnel will be reminded to wash their vehicles prior to a site visit.

Table 11: Identification of Environmental Aspects and Impacts associated with Remediation of drill sites and tracks for the Rum Jungle Exploration Project

ASPECT	POTENTIAL IMPACT	RISK RATING	MANAGEMENT MEASURES (PREVENTION)	MANAGEMENT MEASURES (REMEDIATION)
Driving between drill sites	Spread of weeds	medium	<i>Wash vehicle before accessing area. Ensure all personnel are aware of potential weeds and weed management practices. A Territory Resources Gamba Grass Weed Management Plan is documented in Section 6.1.3.1 Gamba Grass Management Plan</i>	<i>Monitor vehicle to prevent spread of seeds and/or pests. Report the location of any weed species identified to be a threat to the area. Initiate a weed spraying programme at onset of wet season when new shoots emerge. Monitor progress of spraying about a month later. See Section 6.1.3.1 Gamba Grass Management Plan</i>
Remediation of drill pads and tracks	Threat to native flora/fauna	low	Adhere to recommendations from external flora/fauna environmental surveys. Ensure that site personnel and contractors have taken and understand the Environmental Site Induction they are required to take before they can work on site	There are no land disturbing activities planned for the immediate future, so impact will be low. Sightings of endangered species at Rum Jungle to be reported to the site manager at the Territory Resources
Remediation of drill pads and tracks	Ground/soil disturbance	low	Use experienced personnel to minimize potential damage including “blade up” techniques in track remediation to preserve rootstock where possible. Inspect hollow logs for quolls or other small animals	During remediation process, spread topsoil that was retained during the original land clearing
Drill holes not capped	Fauna entrapment down open drill hole	medium	If uncut and uncapped drill holes are encountered during site audits, then the field person should place a temporary cover (usually a large rock) over the open drill hole and report the location immediately to the Site Manager	The drill hole must have the collar cut 0.4 m below the ground surface and the drill hole plugged with a concrete plug, then backfilled with soil.
Erosion and Sediment Control	Erosion channels forming	medium	Ensure that rehabilitation includes scarification across the slope to prevent erosion channels forming in the wet season	Monitor remediation sites especially on sloping ground. Engage earthmoving contractor or site personnel to rectify the situation in order to prevent future erosion channels forming
Waste	Visual disruption and pollution	low	Monitor which sites have waste material (rubbish) and dispose of material at a licenced waste disposal facility	Remove all waste as observed. Remind all personnel and contractors of the importance of not littering and damaging the environment
Remediation of drill pads and tracks	Disturbance to cultural heritage sites	low	Ensure earthmoving contractor and site personnel are aware of areas of cultural significance	Maintain awareness of areas that have cultural or archaeological significance and ensure these areas are not disturbed
Fuel leak	Hydrocarbon spill (fuel tank)	low	Ensure all vehicles are in good condition	Report any fuel spills to the Territory Resources Site Manager immediately
Fire	Damage to the environment – displace native fauna and destroy endemic flora	medium	Report all fires immediately to the relevant NT authorities if out of control. Notify adjacent landowners immediately and the Territory Resources General Manager	Small fires caused by vehicle mufflers should be put out with a fire extinguisher. Territory Resources will not undertake any back-burning activity at the Rum Jungle Project Area

5.5 ENVIRONMENTAL AUDITS, INSPECTIONS AND MONITORING

Environmental inspections are conducted throughout and upon completion of the exploration activity or drill programme to ensure compliance with environmental regulations. The ongoing rehabilitation programme is planned based on these observations and upon completion, an annual audit of the area is undertaken to ensure successful rehabilitation.

A site audit for the 2014 drill programme was conducted in July 2015. The results (including photographs) of this audit are in the 2015-2016 Rum Jungle MMP (Glass, 2015). The 2015 site audit determined that all drill sites had undergone successful rehabilitation. The DPIR also conducted an independent site audit for the Rum Jungle project in October 2016 and indicated by email that they were happy with the status of the rehabilitation and authorised a large proportion of the security held in trust by the department to be returned to Territory Resources. A nominal amount of money has been retained by the DPIR to be held in trust to cover weed management programmes.

The next site audit will occur in July 2017 when the author of this report will be in the Northern Territory. An evaluation will be made of the status of weeds in the area, especially gamba grass.

5.6 ENVIRONMENTAL PERFORMANCE

5.6.1 OBJECTIVES AND TARGETS

The main objective and overall target concerning the exploration drill programmes is to successfully rehabilitate the drill sites and tracks back as close as possible to their original natural condition. The plan is to restore the ground disturbed areas to a state which promotes a long-term successful rehabilitation in which the appearance and biodiversity of the rehabilitated areas is in keeping with the surrounding undisturbed areas. The objectives and targets for rehabilitation do not change over time.

Criteria used to “measure” successful rehabilitation (as requested by the DME in the Comments section of the 2016 Acceptance Letter for the Rum Jungle Project Area August 2016) are:

- Drill holes capped and plugged as per NT guideline *aa7-029 Construction and Rehabilitation of Exploration Drill Sites*;
- The re-establishment of vegetation communities through natural re-seeding from adjacent local flora;
- Remediation from natural revegetation and grading of drill pads and tracks to bring the disturbed areas as close as possible to their original natural condition prior to clearance;
- Over time, the disturbed areas have the appearance and biodiversity with surrounding undisturbed ground

5.6.2 PERFORMANCE REPORTING

Environmental inspections are conducted during and after the remediation process to ensure compliance with environmental regulations. For recent drill programmes, this includes drill collar cutting and capping and also recontouring involving earthmoving equipment. The ongoing rehabilitation programme is planned based on these observations and upon completion, an annual audit of the area is undertaken to ensure successful rehabilitation. To check the status of remediation, a site audit will take place in July 2017 and will be undertaken by the author of this report.

5.7 EMERGENCY PROCEDURES AND INCIDENT REPORTING

All environmental incidents are recorded in a Territory Resources site register and upon investigation; remedial action is taken in accordance with the severity of the incident. Information relating to environmental incidents

are analysed and communicated to the Territory Resources (Territory Iron) Frances Creek Site Manager. Territory Resources personnel are based at the Frances Creek mine site with the exception of the General Manager and a clerical staff member who are based in Palmerston; see also **Appendix III** – 2017 Environmental Exploration Management Plan – Rum Jungle. The plan has been written to account for future exploration activity for the Rum Jungle Exploration Project, including drilling and land disturbance. Incidents rated as “Class 2” and above (using the impact and severity classification matrix as outlined in the Department of Primary Industry and Resources Draft Guideline Environmental incident reporting under Section 29 of the Mining Management Act) are to be reported to the Chief Executive Officer of the DPIR.

6.0 EXPLORATION REHABILITATION

6.1 REHABILITATION METHODS

6.1.1 DRILL HOLE REHABILITATION

The rehabilitation procedure for RC drill holes involves a two-stage process including an initial clean-up process, drill hole capping, collar cutting, drill hole plugging and secondly, earthworks involving scarification of the soil and recontouring (if required) to return conditions as close as possible to the original natural topography.

Upon completion of drilling, all bags and other foreign matter were removed from the drill sites and transported and disposed at the waste area at the Frances Creek mine site (which is located at Territory Iron’s Frances Creek mine and field operations base). The mine site waste disposal is in accordance with Territory Iron’s mine site Waste Management Plan 2013 which is aimed at compliance with the Mining Management Act (2012) and the Waste Management and Pollution Control Act (NT) 2011.

All drill holes are cased to 12 m with PVC pipe and the PVC pipe then cut below ground level to 0.4 m and plugged. Preserved topsoil was placed over the collar once the drill hole was surveyed for accurate positioning.

The second stage in the rehabilitation process involves gentle recontouring with earthmoving equipment for the entire drill area to redistribute and scarify the topsoil set aside when clearing, to control and prevent erosion. The recontouring aims to reproduce as closely as possible, the original contours and topography of the land surface prior to drill pad construction. In general, the drill pads are rehabilitated in order to promote rapid revegetation with a minimum of erosional damage. For drill pads on near flat surface areas, the topsoil was redistributed and ripped (scarified) to provide conditions ideal for seed capture and germination. For drill sites on gentle slopes, the earlier removed topsoil (collected upslope at initial site preparation was again redistributed over the disturbed area. It is hoped that the topsoil would contain native seeds endemic to the area and the uneven (scarified) surface would provide an ideal environment for additional (airborne) seeds to be captured to facilitate natural revegetation. During the scarification process for gentle slopes, the soil was ripped across slope (not downslope) to prevent erosion channels forming during the wet season. Drill hole closure and rehabilitation follows the guidelines as closely as possible from the NT Department of Primary Industry and Resources Advisory Note *Construction and Rehabilitation of Exploration Drill Sites*.

6.1.1.1 2005 Drill Programme Rehabilitation

Arnhem Exploration and Rural Services (AERS) undertook the rehabilitation for the 2005 drill programme in December 2005, Rafty and Vivian, (2006). Below is an excerpt (verbatim) from Rafty and Vivian (2006).

“The following rehabilitation was undertaken:

- *Samples for two holes (YRPC025 and YRPC026) were removed to the Frances Creek sample farm,*
- *All remaining drill cuttings were emptied from the bags and dispersed on site. The empty bags and all rubbish were disposed of at the Batchelor rubbish dump.*

- *Drill holes PVC stems were cut 30cm below surface and plugged using concrete plugs.*
- *Fence droppers were used to mark the site of each hole for future possible re-location.*

In Rafty and Vivian (2006) it was mentioned that a report by AERS was located in *Appendix 5 of their report*. Unfortunately, there is no record of any of the Appendices related to this report on the Territory Iron server; hence it could not be included in this Rehabilitation Report.

6.1.1.2 2014 Drill Programme Rehabilitation

Rehabilitation for the 2014 drill programme at the Rum Jungle Exploration Project Area is described in detail in Glass (2015) and is quoted (verbatim) here in italics:

“Rehabilitation for the 2014 drill programme commenced in December 2014, immediately post-drilling and was completed early 2015. All rehabilitation involving earthmoving equipment was completed in 2014. This was beneficial as it allowed the natural landscape to recover over the 2014-2015 wet season. In accordance with mitigation strategies determined in Flora, Fauna and Heritage surveys completed on the Rum Jungle Project Area, (Appendix II) Territory Resources adhered to these recommendations (also summarised in Tables 4 and 5).

The rehabilitation procedure for RC drill holes involved a two-stage process including an initial clean-up process, drill hole capping, collar cutting, drill hole plugging and secondly, earthworks involving scarification of the soil and in general recontouring (if required) to return conditions as close as possible to the original natural topography.

It was noted that potentially “asbestiform” minerals may have been encountered during the drill programme. Glass (2015) writes (verbatim) as follows:

*“Even though the minerals were determined **not** to be asbestiform, the safety measures implemented in the Asbestos Management Plan were still implemented as a matter of procedure. After the drill programme was completed, bags containing the talcose minerals were safely disposed of at the Shoal Bay Waste Management Facility in Darwin. The landowners, the tenement Title Holders, the NLC, contractors associated with the drill programme, laboratories analysing the samples, couriers and Worksafe NT were contacted by the Territory Resources Exploration and Health and Safety Departments as a matter of precaution and notified of the non-hazardous nature of the material once the chemical analyses were received.”*

All drill holes were cased to 12 m with PVC pipe and the PVC pipe then cut below ground level to 0.4 m and plugged. Preserved topsoil was placed over the collar once the drill hole was surveyed for accurate positioning. Free flowing water was not intersected in any of the drill holes and therefore the drill holes did not require grouting.

The second stage in the rehabilitation process involved gentle recontouring with earthmoving equipment for the entire drill area to redistribute and scarify the topsoil set aside when clearing, control and prevent erosion and return the area as close as possible to the original natural conditions.

For drill pads on near flat surface areas, the topsoil was redistributed and ripped (scarified) to provide conditions ideal for seed capture and germination. For drill sites on gentle slopes, the earlier removed topsoil (collected upslope at initial site preparation) was again redistributed over the disturbed area. It is hoped that the topsoil would contain native seeds endemic to the area and the uneven (scarified) surface would provide an ideal environment for additional (airborne) seeds to be captured to facilitate natural revegetation. During the scarification process for gentle slopes, the soil was ripped across slope (not downslope) to prevent erosion channels forming during the wet season. A Traditional Owner Elder of the Finiss River Group (same Elder

during the drill pad and track clearing process) was present for all rehabilitation earthworks. Drill hole closure and rehabilitation was in accordance with The NT Department of Resources' Advisory Note Construction and Rehabilitation of Exploration Drill Sites.

Tracks that were constructed specifically for the drill programme were graded as closely as possible to approximate the original landform conditions. The work required was kept to a minimum as the landform area was relatively flat and only required minor recontouring.

To prevent the spread of weed species e.g. Gamba grass (*Anthropogon gayanus*), Territory Resources vehicles were washed down daily at the back of the local BP Service Station in Batchelor (27 Rum Jungle Road, Batchelor NT 0845) using a high pressure cleaner (owned by Territory Resources). All water for the drill rig was locally sourced from a bore at a farm at 110 Bevan Road, NT 0822 which is less than 2 km from the drill area. The drill rig was washed at this site prior to commencement of drilling and thoroughly upon cessation of drilling. Although a wash down site was proposed in the 2013 Amendment to the MMP, (refer to Appendix 3, 2013-2014 Rum Jungle MMP), it was decided to utilise the rear section of the BP Service Station in Batchelor. It is important to note that the Rum Jungle/Batchelor region in general already has an infestation with gamba grass (*Anthropogon gayanus*) and the grass is also manifest on landowner properties within the Rum Jungle Project Area prior to the drilling. The last drill programme in the area was conducted in 2005, ten years earlier.

The monsoonal wet season climate and conditions for the Rum Jungle Exploration Project Area are naturally conducive for native regrowth and regeneration and the area has already undergone one wet season (2014-2015). Photographs of representative drill sites and tracks were taken in July 2015 and the locations shown in Figure 6. Figures 7 to 35 show the photographs for each site.. For all drill sites, an orange and white striped staff (1.25 m high) is positioned to show the location of each drill hole and is used for scale. In all photographs of drill sites, the view is consistently to the north and the photographer positioned between 10 and 15 m from the drill hole (indicated by the staff) due to the density of surrounding vegetation. An excel file with the grid coordinates and notes for each drill or track site is located in Appendix VI. The project area is relatively flat to gently sloping and after one wet season growth, there appears to be no risk of erosion or sediment loss to the drill sites, however this is largely a function of the flat-lying nature of the terrain. Juvenile vegetation is up to 0.5 – 1.0 m in height and is analogous to the vegetation in the surrounding environment indicating germination of locally derived seeds which were hosted in the topsoil."

As requested by the DME in their 2016 MMP Acceptance Letter, a query was made as to where the drill spoil was disposed and what constituted "foreign waste". Drill spoil material was left *on-site* at the Rum Jungle project and emptied down hole and dispersed over the ground (apart from acicular talcose material which was disposed of at the licenced Shoal Bay Waste Management Facility in Darwin. Empty green sample bags ("foreign waste") were disposed of at the Frances Creek mine site waste disposal facility (Glass, 2015). As such, "foreign waste" is described as empty green sample bags. The DPIR (previously DME) has indicated that for the Rum Jungle project all waste of this description (empty plastic bags etc.) should be disposed of at a licenced waste disposal facility and not at the Frances Creek mine site waste disposal area. Territory Resources acknowledges and will abide by this for future exploration programmes.

A site audit for the 2014 drill programme was conducted in July 2015. The results (including photographs) of this audit are in the 2015-2016 Rum Jungle MMP (Glass, 2015). The 2015 site audit determined that all drill sites had undergone successful rehabilitation. The DPIR also conducted an independent site audit for the Rum Jungle project in October 2016 and indicated by email that they were happy with the status of the rehabilitation and authorised a large proportion of the security held in trust by the department to be returned to Territory Resources. A nominal amount of money has been retained by the DPIR to be held in trust to cover weed management programmes.

The next site audit will occur in July 2017 when the author of this report will be in the Northern Territory. An evaluation will be made of the status of weeds in the area, especially gamba grass.

6.1.3 WEED MANAGEMENT

Introduced weeds have a deleterious impact on the natural environment by directly competing with native species for light, water and nutrients. Their rapid growth rate means that they can out-compete endemic species and hinder their growth.

Legislation was introduced in the Northern Territory to provide advice for weed management and mitigation strategies for weed control and eradication. The Northern Territory Weed Management Act (2001) outlines community and landholder responsibilities for developing weed management strategies. Under this Act, the owner or occupier of the land must take all reasonable measures to prevent the land being infested with a declared weed (Part 3, Management of Weeds, Division 1, 9 General Duties 1 (a)). Table 1 lists the classification of weeds in the Northern Territory (Northern Territory Weeds Management Act; 2001).

Table 12: Classification of Weeds in the Northern Territory as per the Northern Territory Weeds Management Act (2001)

Classification of Northern Territory Weeds	
Class A	To be eradicated (Reasonable effort must be made to eradicate the plant within the NT)
Class B	Growth and spread to be controlled (Reasonable attempts must be made to contain the growth and prevent the movement of the plant)
Class C	Not to be introduced into the NT (All Class A and B are also classified as Class C)

6.1.3.1 Gamba Grass Management Plan

Gamba grass (*Anthropogon gayanus*) is a tall, perennial grass and a declared weed which has proven to be highly invasive in the Northern Territory. It was introduced from Africa to Australia in the 1930's primarily for use as cattle fodder. For this reason, it was widely planted in agricultural and pastoral areas.

The Department of Environment and Natural Resources describes gamba grass as typically growing to about 4 m tall and 70 cm in diameter, with leaves to 1 m long and up to 3 cm wide. The leaves stay green after native annual grass species have died off. Gamba grass creates high fuel loads, which increases the fire risk.

The Northern Territory Government have designated two zones for its control; Class A Eradication Zone and Class B Management Zone, Figure 27. The Rum Jungle Exploration Project lies within the Class B, Management Zone. A link to the NT Government website is shown below:

https://nt.gov.au/_data/assets/pdf_file/0011/233858/gamba-grass-declaration-zone-map.pdf

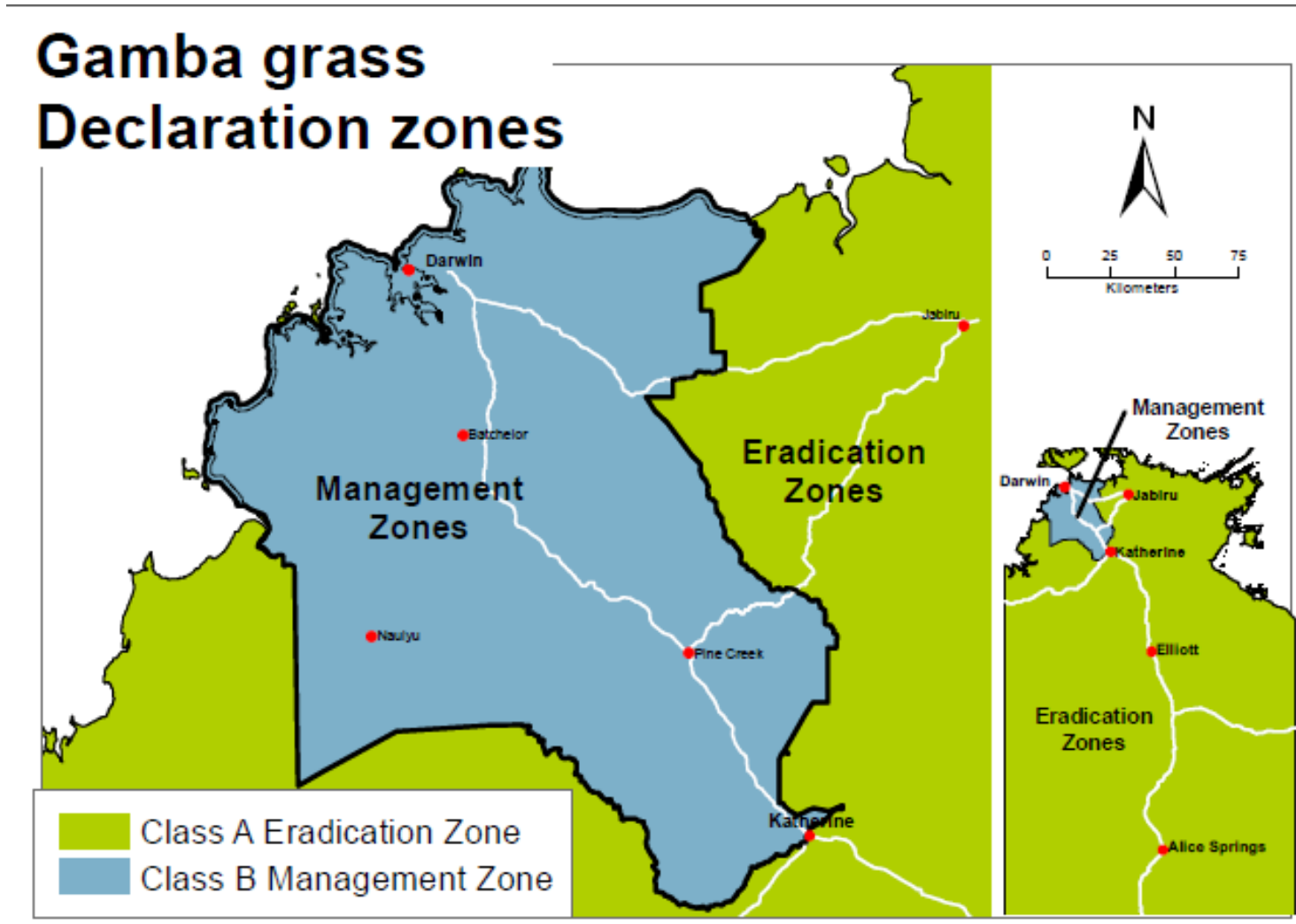


Figure 27: Northern Territory Gamba Grass Declaration Zone Map. Source: NT Government; see web link in text

Landowners within the Class B Management Zone are legally required to contain existing infestations and eradicate new infestations (Laurencont *et al.*, 2013). In addition, results from a 2008 weed survey of the Coomalie Shire revealed gamba grass was present in more than 90% of properties within the shire.

Based on the *Former Rum Jungle Mine Site 5 Year Weed Management Plan* report by Wildman Land Management (2011; **Appendix III**), for the Rum Jungle Mine Site Weed Management Area (Figure 28), gamba grass is classified as a Class B and C weed in accordance with the NT Weeds Management Act, Table 12..

The Rum Jungle Mine Weed Management Area (Figure 28) is less than 600 metres from the Territory Resources Rum Jungle Project Area and gamba grass is documented as being the dominant species accounting for almost 50% of all recorded weeds in this area (Wildman Land Management NT Government report, 2011). In this area, gamba grass represents 46% to 56% of the total of the Rum Jungle Mine weed infestations.

An integrated management strategy has been developed by the Northern Territory Department of Environment and Natural Resources, web link

<https://nt.gov.au/environment/weeds/list-of-declared-weeds-in-the-nt/gamba-grass>

The reports are located in **Appendix VI**. Table 13 shows the *Northern Territory Department of Environment and Natural Resources Gamba Grass Management Guide*.

Table 13: Northern Territory Department of Environment and Natural Resources Gamba Grass Management Guide

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Flowering												
Seed Fall												
Germination												
Slashing												
Fire												
Spraying												
		<i>Approximate times for reproduction</i>						<i>Control option less suitable</i>				
		<i>Months most suitable for control option</i>						<i>Control option not suitable</i>				

A critical component for the control of gamba grass is spread prevention. Gamba grass seed can be distributed by wind dispersion, animals, vehicles and water. To prevent gamba grass spread during an active exploration programme, vehicles should have a designated wash-down area to prevent the contamination of clean areas. A description of the wash-down procedures used by Territory Resources during the 2014 drill programme is documented in Glass (2015) and is reproduced (*verbatim*) hers:

“To prevent the spread of weed species e.g. Gamba grass (Anthropogon gayanus), Territory Resources vehicles were washed down daily at the back of the local BP Service Station in Batchelor (27 Rum Jungle Road, Batchelor NT 0845) using a high pressure cleaner (owned by Territory Resources). All water for the drill rig was locally sourced from a bore at a farm at Bevan Road, NT 0822 which is less than 2 km from the drill area. The drill rig was washed at this site prior to commencement of drilling and thoroughly upon cessation of drilling. Although a wash down site was proposed in the 2013 Amendment to the MMP, (refer to Appendix 3, 2013-2014 Rum Jungle MMP), it was decided to utilise the rear section of the BP Service Station in Batchelor. It is important to note that the Rum Jungle/Batchelor region in general already has an infestation with gamba grass (Anthropogon gayanus) and the grass is also manifest on landowner properties within the Rum Jungle Project Area prior to the drilling. The last drill programme in the area was conducted in 2005, ten years earlier.”

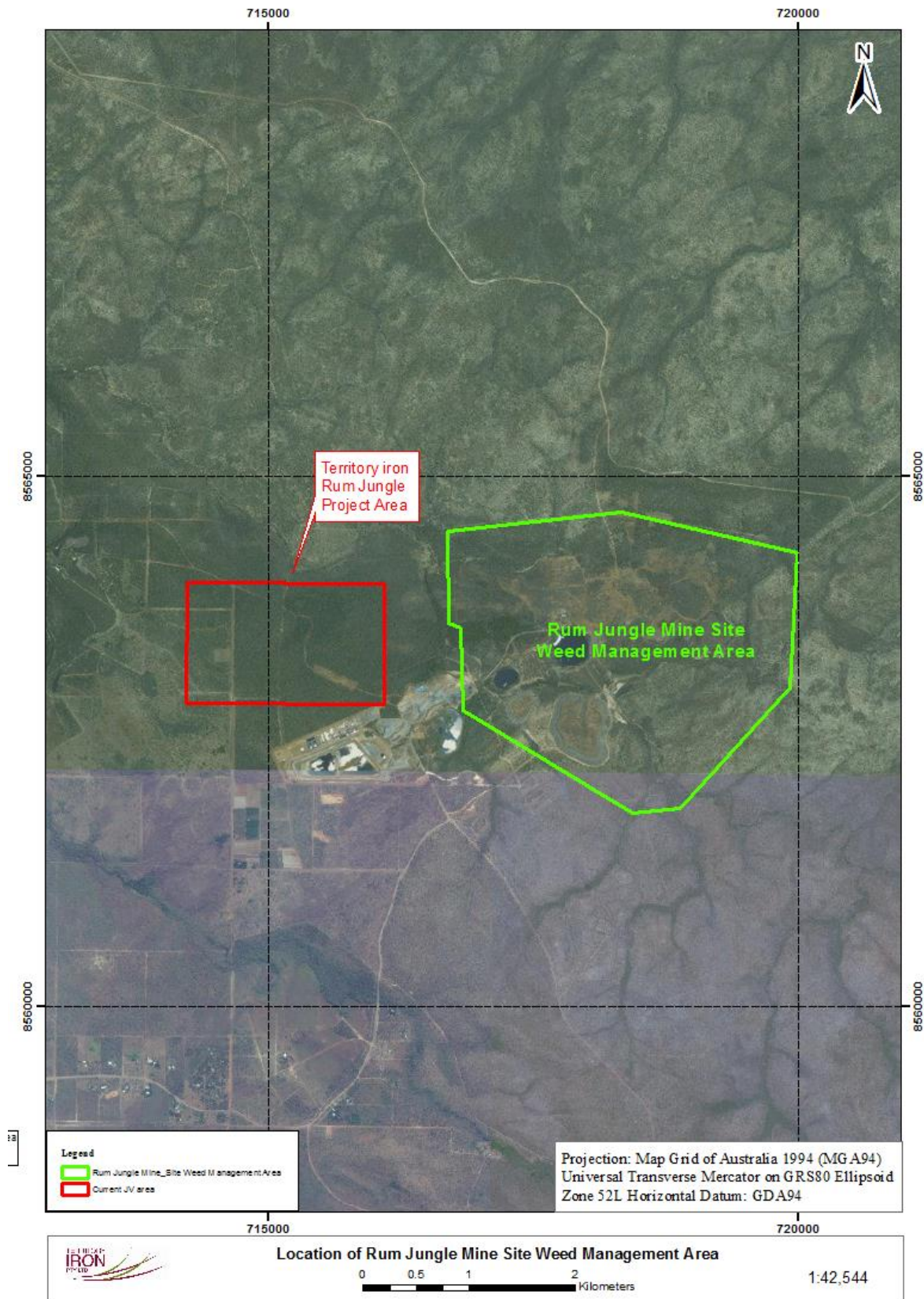


Figure 28: Location of Rum Jungle Mine Weed Management Area (Wildman Land Management NT Government report, 2011) showing proximity of site to the Rum Jungle Project Area

Methods of control to mitigate gamba grass infestations (*source*: Northern Territory Department of Environment and Natural Resources) include:

- i. **Spread prevention** by spraying from the edges of isolated infestations and gradually working inwards until the weeds are eradicated;
- ii. **Physical control** methods include whole plant removal by hand or mattock (only feasible for small infestations and not really effective) or for larger areas, slashing can be effective. If the grass is slashed prior to seed set, then this will prevent germination of new plants. Slashing also has the benefit of reducing biomass preventing seed development and fuel load thus reducing the risk of fire.
- iii. **Grazing.** For areas within Class B Management Zone where cattle are present, grazing may be an effective control method as the grass is kept to low levels thus preventing seed set. Ideally the grass should be kept to less than 1 metre to prevent the grass becoming woody and unpalatable;
- iv. **Fire** can be effective if there is a sufficient fuel load, however, it will not completely eradicate gamba grass. Fire control should not be used when plants have produced seed as hot air currents may disperse seeds to a wider area;
- v. **Chemical control** includes spraying with a herbicide – Glyphosate (360g/L) mixed with 1% water plus wetting agent (surfactant). The optimal time to spray gamba grass is from December to March. Gamba grass should be sprayed once the weeds have new green leaves (at least 40 cm long) following the first onset of rain. The plants should be sprayed before they reach about 0.5 metre in height. Follow-up spraying should occur at the end of the wet season to target new growth from existing plants and seedlings which have germinated.

Gamba grass has been identified within the project area especially along the main tracks. To control the infestation, Territory Resources has developed a management strategy (Table 14) to control gamba grass as follows:

- i. **January to February** - site visit to evaluate spread and growth of gamba grass
- ii. **February to March** - spray programme to target end of wet season growth
- iii. **July to August** - site visit to evaluate spread and growth of gamba grass
- iv. **November to December** - spray programme to catch new growth with the onset of the wet season

Table 14: Territory Resources Gamba Grass Control Plan

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Site inspection												
Spraying												
Slashing/fire control												

To manage the gamba grass within the project area Territory Resources has engaged a local contractor from Lake Bennett who specializes in large-scale, pastoral spraying and slashing (fire break control) programmes. The contractor was engaged to undertake gamba grass spraying along tracks within the project area in early May 2016 and May 2017, Figure 29. However from this time forward, as per the spraying programme outlined in Table 14, the next spray programme will commence just after the initial onset of the wet season, November to December 2017 and again at the end of the wet season, February to March 2018. A site audit in September 2016 revealed that the May 2016 spray programme killed the targeted gamba grass infestations.

Territory Resources would like to implement fire breaks through slashing as well as the control of gamba grass by chemical methods. This will be discussed with the Traditional Owner Elder at the next on-site meeting. However, Territory Resources will not adopt a method of control for gamba grass using **fire** owing to the proximity of freehold landowners in the area and the potential danger to their properties.

6.2 COST OF CLOSURE ACTIVITIES

All drill activity conducted by Territory Resources has been completed and accepted by the DPIR. The DPIR also conducted an independent site audit for the Rum Jungle project in October 2016 and indicated by email that they were happy with the status of the rehabilitation and authorised a large proportion of the security held in trust by the department to be returned to Territory Resources. A nominal amount of money has been retained by the DPIR to be held in trust to cover weed management programmes.

6.3 REHABILITATION MONITORING

Since the remediation for Territory Resources drill programmes is now complete and accepted by the DPIR, future site audits will be conducted annually to check for weed growth, especially gamba grass and to provide remedial action where necessary. The next site audit with a Finnis River Aboriginal Land Trust Elder present will occur in July 2017 when the author of this report will be in the Northern Territory. An evaluation will be made of the status of weeds in the area, especially gamba grass.

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APPENDIX I: DPIR NOMINATION OF OPERATOR FORM

APPENDIX II: EXPLORATION DRILL HOLE DATA AND REMEDIATION HISTORY

APPENDIX III: REPORTS

APPENDIX IV: WATER BORE DATA

APPENDIX V: NR MAPS FLORA AND FAUNA ATLAS

APPENDIX VI: GAMBA GRASS WEED MANAGEMENT REPORTS