

Application for Authorisation



Northern Territory of Australia – Mining Management Act 2001

Section 1 – Project details				
Authorisation – Please mark with an X all relevant options				
New Authorisation Section 36(1) Mining Management Act		Variation of Authorisation Section 38(1) Mining Management Act		X
Exploration	Yes	Extractive		Mining
Project name Please provide a new or existing project name	Mount Doreen			
Authorisation number Insert existing authorisation number in the space below, where applicable.	1146-01			
Section 2 – Operator details				
Name of Operator Use ASIC-ABR registered name (if a company) or name of applicant	Litchfield Minerals Limited			
ACN Leave ACN/ABN blank if not relevant	612 660 429	ABN		
Postal Address	Suite 606, level 6, 10 Market Street Brisbane			
State	QLD	Post Code	4000	
Street Address	Suite 606, level 6, 10 Market Street Brisbane			
State	QLD	Post Code	4000	
Contact Person Include name, title and position	Matthew Pustahya			
Phone (business) Include area code		Phone (mobile)	0499933314	
Email Address Note: all correspondence will be sent via email	Matthew@litchfieldminerals.com.au			

Section 3 – Declaration

I hereby declare that:

The information provided in this application, and including the attached associated Mining Management Plan, is correct and accept that failure to supply the information required may delay processing of this application;

Director Name - please print	Matthew Pustahya		
Director Signature		Date	10.04.2024
Director or Company Secretary Name - please print	Peter Harding-Smith		
Director or Company Secretary Signature		Date	10.04.2024

*Applications must be accompanied by the Mining Management Plan (MMP) for assessment and, if necessary, a completed Nomination of Operator Form.

Mining Management Exploration Activities

Northern Territory of Australia – Mining Management Act 2001

It is recommended that the Mining Management Plan (MMP) is completed in conjunction with the user guide available on the [Northern Territory Government website](#).

Section 1 – Project Details

Project Name Provide new or existing project name	Mount Doreen
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Authorisation Number Insert existing authorisation number, where applicable	1146-01
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Operator Name Use ASIC-ABR registered name (if a company), or name of the applicant	LITCHFIELD MINERALS LIMITED
Operator ABN and ACN numbers	ACN 612 660 429

Location and Access Details Include brief description of the location, access details, and distance to nearest town or community	Exploration License 31305 lies within the Mount Doreen region 1:250 000 Geological Map sheet, approximately 350kms Northwest of Alice Springs, up Tanami Road. The EL was granted & renewed to Litchfield Minerals Limited on the 5 th June 2026 for a period of 6 years, Access is relatively easy via different station access tracks and fence lines along Tanami Road. The tenement is across 144 sublots situated 20kms Northwest of Yuendumu, and next door to the Energy Metals Bigryli uranium deposit.
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Target Commodity Details Include target mineral commodities (i.e. gold, copper etc.)	Base & Precious Metals
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Mining Management Exploration Activities

<p>Mining Activities Summarise the mining activities (exploration) to be the subject of the proposed Authorisation or Variation.</p> <p>Drilling programs over a maximum of four years are supported and encouraged and can be staged. Please refer to the guidelines for further information.</p>	<p>Litchfield is seeking approval for 3 drill holes at wolfram Hill adding to our current mining management plan.</p> <p>3 Drill holes/ 3 pads – Wolfram Hill</p>
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Mining Management Exploration Activities

<p>Proposed Schedule Include start and finish dates of ground disturbing work</p>	<p>1st May 2024: Temporary track and drill pad clearance and touch ups for drill rig to access EL 31305 drill targets. 5th May Systematic drilling at the Wolfram Hill location.</p> <p>After completion of work across the nominated sites are done, we will plan further dates depending on available capital at the time from outcomes drilled.</p> <p>Rehab of remaining pads and drill access tracks at all tested targets and where not requested to remain by Traditional Owners/ Ngalyia Aboriginal Corporation RNTBC. Note: Schedule is likely to change dependent of COVID-19 and finite supply of contractors in the area</p>
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Mining Interest and Land Ownership

List the mining interests (titles), the title holder name/s, the title expiry date and the Property name/Land holder (e.g. pastoralist or Aboriginal land trust) for each title.

Title Number	Title Holder	Expiry Date	Underlying Property Name or Land Holder
EL 31305	Litchfield Minerals limited	5.6.26	Mount Doreen
	Crown Point Pastoral		Mount Doreen Station

Delete or add rows as required

Please note a Land Access Agreement (LAA) is required for disturbance proposed on Pastoral Properties on Exploration Licence (EL).

Organisational Structure

Position Title	Name
Managing Director	Matthew Pustahya
General Manager	
Exploration Manager	David Esser

Delete or add rows for various position titles as required

Section 2 – Operator Self-Assessment of the Environmental Risk

The purpose of this self-assessment is to ensure Operators complete a project risk assessment of potential environmental impacts and are aware of other legislative obligations from various Agencies. As a result of this self-assessment, further information may be required in the form of a management plan to enable full assessment of the MMP. If you have any queries please contact a Mining Officer prior to submitting the MMP. Useful resources to assist with this self-assessment are provided in the User Guide.

Environmental considerations

ASSESSMENT ASPECT	YES or NO	ACTIONS REQUIRED (if answered YES)	APPENDED INFORMATION (e.g. evidence of consultation with DEPWS and/or management plan where required).
<p>Step 1: Are there any threatened flora and fauna species or habitats of significance that may occur in the proposed work area?</p>	YES	<p>The Operator must assess the likelihood of threatened species or their habitats occurring at or near the site. If the likelihood is high, then a “Significant Impact Assessment” must be undertaken and appended to this document.</p> <p>Birds Curlew Sandpiper Australian Painted Snipe Night Parrot Grey Falcon Princess Parrot, Alexandra's Parrot</p> <p>Mammals Ghost Bat Greater Bilby Warru, Central Australian Rock-wallaby\</p> <p>Reptile Great Desert Skink, Tjakura, Warrarna, Mulyamiji</p>	<p>e.g.</p> <ul style="list-style-type: none"> - Consulted EPBC Protected Matters Search Tool and appended it to this document. - Consulted EPBC Protected Matters Search Tool and previous Biodiversity Management Plan, which is still current/related to the proposed work, appended to this document.
<p>Step 2: Are there any known declared weeds within the proposed work area?</p>	YES	<p>Seek advice from DEPWS – Weed Management Branch to determine if weeds are present on site and ensure management measures are appropriate for the level of activity proposed and attach a Weed Management Plan (if required).</p>	<p>All vehicles including Litchfield field vehicles and drill rig will be cleaned for weeds/seeds before entering Mount Doreen Station</p>

Mining Management Exploration Activities

ASSESSMENT ASPECT	YES or NO	ACTIONS REQUIRED (if answered YES)	APPENDED INFORMATION (e.g. evidence of consultation with DEPWS and/or management plan where required).
Step 3: Will you be using water from bores or other sources for the operation?	YES	Water related matters on mineral titles are no longer exempt from the <i>Water Act 1992</i> . Please consult with DEPWS Water Resources and/or familiarise yourself with the <i>Water Act</i> to ensure compliance under this Act when undertaking exploration activities.	Litchfield intend on building sumps and brining in water through a water truck. Water will be recycled for the drilling campaign and disposed of accordingly after

Environmental assessment and cultural considerations

ASSESSMENT ASPECT	YES or NO	MANAGEMENT REQUIREMENTS
Step 4: Is your project likely to have a significant impact on the environment?	No	Refer to the NTEPA Environmental Factors and Objectives Guideline.
Step 5: Are there Aboriginal sacred sites in the Project area?	Yes	<p>Sacred Sites are protected under the NT <i>Aboriginal Sacred Sites Act 1989</i> and administered by the Aboriginal Areas Protection Authority (AAPA). It is recommended that advice be sought from AAPA in relation to sacred site protection.</p> <p>A search of the AAPA register indicates there are 10 sacred sites within EL31305. The nearest sacred site to any of the site locations mentioned within this MMP is 25Kms away from any of the proposed drilling areas. We will include general locations of the Sacred sites in the location plan.</p> <p>We have since had AAPA out on site to clear and indemnify Litchfield Minerals over that area which is located at Wolfram Hill.</p>
Step 6: Are there archaeological and heritage sites in the Project area?	No	<p>Heritage and archaeology sites are protected in the NT. NT Department of Territory Families, Housing and Communities (DTFHC) administers the <i>Heritage Act 2011</i>.</p> <p>Seek advice in relation to protection of heritage and archaeological sites.</p>

Section 3 – Amendments

As per Section 41(3) of the *Mining Management Act*, an MMP reviewed and amended under Section 41(1)(a) is to have amendments made since the previous MMP submission clearly identified.

Section	Amendment
Section 4	Inclusion of 3 holes designated for Wolfram Hill.
Section 4	Hole Depth have been changed to allow for 500m.
Section 4	RC holes have been changed to Drill holes for the purpose of utilizing numerous drilling techniques.

Delete or add rows as required

Section 4 – Activities Proposed for this MMP only

Provide relevant EL numbers

Mining Interests (i.e. titles)	EL 31305
Number and type of proposed exploration drill holes	3
Maximum depth of proposed holes (m)	Max 500
Number and size of drill pads to be cleared (Length:15 m x Width 15:m)	3
Total area of drill pads to be cleared (ha)	0.0675 Ha
Number of proposed water bores	0
Is drilling likely to encounter groundwater in multiple or confined aquifers? (Y, N, unsure) If answering yes, please provide the number of exploration holes where this is likely to occur	Unsure – However I'd like to note that historical drilling in the area has not encountered aquifers. The reason I am saying is unsure is there is always the potential to hit unknown aquifers however we do not believe this will be the case given our historical searches.
Number of costeans	
Volume to backfill costeans / Sumps (Length: 3 m x Width 2:m x 2 Depth:1.5m)	$3 \times 2 \times 2 = 12$ $12 \times 3 = 0.0036$ 3 sumps = 0.0036Ha
Number of bulk sample pits	Nil
Volume to backfill bulk sample pits (Length: m x Width: m x Depth: m)	Nil

Mining Management Exploration Activities

Mining Interests (i.e. titles)	EL 31305
Bulk sample pits approved under <i>Mineral Titles Act</i> ? (Y or N). If Yes provide approval	Nil
Line/track clearing: (length m x width m)	1,500 Meters Long by 3 Meters Wide
Area of proposed line/track clearing (ha)	1,500M x 3 = 0.45 Ha
Camp area to be cleared (ha)	
Camp Infrastructure (i.e. demountable, tents) Please provide a complete list with measurements as required in the security calculation	
Other	N/A

Mining Management Exploration Activities

Mining Interests (i.e. titles)	EL 31305
Total proposed area of disturbance (ha)	0.5202

Staging approach based on disturbance can be proposed and will be considered by the Department.

Section 5 – Previous Disturbance (for existing Authorisations only)

The 'Disturbance Tracking' spreadsheet must be completed and attached to the MMP submission to complete this section. The spreadsheet is available on the departmental web page where this template is located.

Section 6 – Environmental Management

By checking these shaded boxes, you are agreeing to implement the following minimum environmental management standards on the project area. Where boxes have been left unchecked, justification is required.

6.1	Y	Blade-up approach for clearing will be used (i.e. no windrows, leave root stock and topsoil)
6.2	Y	Significant vegetation will be avoided during clearing (i.e. large trees, specimens providing habitat or food sources, riparian vegetation, and threatened species)
6.3	Y	Vegetation clearing during, and immediately after rainfall events, will be avoided
6.4	Y	Vegetation clearing will be kept to the minimum required to safely traverse vehicles and drill rigs along tracks and drill pads
6.5	Y	Where blade-up techniques cannot be employed, topsoil and vegetation will be stockpiled appropriately for rehabilitation purposes
6.6	Y	All employees and contractors will be trained and inducted in relation to the management of environmental risks in the work area, including weeds, waterways, threatened species, soil erosion, sacred sites and heritage areas
6.7	Y	Sumps will be lined or tanks of appropriate size to contain water, sediment and drilling fluids encountered during drilling, will be used
6.8	Y	Sumps, drill holes, and fuel stores will be located away from environmentally significant areas and water courses
6.9	Y	Excavations (sumps, costeans and pits) will be appropriately ramped to allow fauna egress
6.10	Y	Drill holes will be securely capped immediately after drilling
6.11	Y	Vehicle hygiene measures will be employed to prevent the introduction and spread of invasive species and pathogens when mobilising vehicles and equipment from one location to another
6.12	Y	Hydrocarbon spills will be minimised using liners and drip trays under machinery, and appropriately sized spill-kits available in the event of a spill
6.13	Y	Hazardous substances (including hydrocarbons) will be stored and handled in accordance with relevant Australian Standards
6.14	Y	Hydrocarbons will be stored in lined and bunded areas
6.15	Y	Waste will be stored securely while on-site to minimise windblown rubbish and access by feral animals
6.16	Y	Waste will be removed off-site and disposed of at an appropriate waste management facility
6.17	Y	All environmental incidents will be reported to the Department in accordance with Section 29 of the <i>Mining Management Act</i> .
6.18	Y	Acid and Metalliferous Drainage (AMD) and Potentially Acid Forming (PAF) material derived from drilling cuts will be managed to avoid AMD and PAF related issues on site.

Mining Management Exploration Activities

6.19	Y	Radioactive/NORM drill cuttings will be managed to avoid radiation related issues on site.
6.20	Y	Dust management will be implemented on site.

Justification and alternative management measures:

Section 7 – Rehabilitation and Closure

By checking these shaded boxes, you are agreeing to implement the following minimum rehabilitation standards on the project area. Where boxes have been left unchecked, justification is required.

A refund of security related to completed rehabilitation on site requires the submission of a rehabilitation report including photographs, an updated security calculation and updated disturbance tracking spreadsheet to the Department.

7.1		Drill holes will be plugged below ground level at a minimum depth of 0.4 metres and soil mounded to prevent subsidence, within 6 months of completion of drilling.
7.2	Y	Drill holes encountering multiple or confined aquifers will be grouted with concrete.
7.3	Y	Drill samples/spoil will be returned down drill holes, buried in sumps, or removed from site.
7.4	Y	All drill hole and access markers including flagging tape, wooden markers and star pickets will be removed from site.
7.5	Y	Cut and fill drill pads will be re-contoured to be consistent with the surrounding terrain.
7.6		Drill pads and compacted areas along the contour (on sloping ground) will be ripped/scarified of and tracks will be cross-ripped (zig-zag).
7.7	Y	Tracks will be rehabilitated, including pushing in all windrows, unless otherwise agreed in writing by the land holder or appropriate third party.
7.8	Y	Appropriate erosion and sediment controls will be installed where erosion is evident or likely to occur.
7.10	Y	Access through watercourses will be removed and banks restored.
7.11	Y	All previously disturbed areas will be stable, with no evidence of active soil erosion.
7.12	Y	All excavations will be backfilled within 6 months of their completion.
7.13	Y	All water bores will be decommissioned unless otherwise agreed in writing by the land holder or appropriate third party.
7.14	Y	All rubbish and infrastructure will be removed from site.
7.15	Y	Topsoil will be replaced and vegetation re-established.
7.16	Y	Contaminated soils (e.g. hydrocarbon or hazardous chemicals) will be rehabilitated or removed from site.
7.17	Y	Monitoring will be undertaken following the wet season or a significant rainfall event.

Justification and alternative management measures:

7.1 The majority of holes are fully rehabilitated within 6 months of drilling, but in prospect areas that are subject to on-going downhole assessment, the holes are kept open, but securely plugged or capped. If the site proceeds to mining, the holes may be grouted to depth. Litchfield will maintain a register of drill sites that retain a PVC collar at surface.

Mining Management Exploration Activities

7.6 Ripping of drill pads and access tracks is restricted only to those that have identifiable signs of compaction. Generally, these have received only minimal traffic compared to the main access tracks. Experience across this project indicates that natural rehabilitation of tracks and pads is sufficient.

7.7 Existing tracks won't be remediated. These have been identified prior to works. These were formed at various time by the station & landowner. Litchfield has no control over any infrastructure that was created prior to the EL being granted as it is privately owned land. We will however speak to land owner and if they want them remediated we will of course do so.

Section 8 – Required Attachments

8.1	Y	Initial Application for Authorisation or variation of Authorisation (only if details on the form have subsequently changed).
8.2	N/A	Nomination of Operator Form, where required
8.3	Y	Security Calculation Spreadsheet
8.4	Y	Evidence of Land Access Agreement if operating on an Exploration Licence (EL) on Pastoral Lease (e.g. two-ways exchange of email)
8.5	Y	Disturbance tracking spreadsheet (for existing Authorisations)
8.6	Y	Spreadsheet with coordinates of proposed drill holes or polygons of target areas
8.7	Y	KML/shape files/track logs of proposed tracks, camp sites and proposed drill holes or polygons of target areas
8.8	Y	Map(s) of the work area(s) showing: <ul style="list-style-type: none"> 1. title boundaries and title numbers 2. current and proposed drill holes, or polygons of target areas 3. current and proposed tracks 4. rehabilitated areas 5. camp sites 6. heritage sites or significant environmental areas 7. environmental constraints
8.10	N/A	Radiation Management Plan (if applicable)
8.12		Document(s) being appended in relation to Section 2 (if any): <ul style="list-style-type: none"> - -



ENVIRONMENTAL RISK ASSESSMENT AND MANAGEMENT PLAN

Mt Doreen Exploration Program

1. Introduction

1.1 Background

Litchfield Minerals Pty Ltd (“Litchfield”) obtained an Exploration License (EL 31305) which lies within the Mount Doreen region of southwest Northern Territory on the 5th June 2018, for a period of 6 years

Litchfield have completed preliminary assessments across EL 31305 commencing with assessment of historical exploration data, geophysics and remote sensed data. On-ground exploration was undertaken with mapping and prospecting using a 4WD or ATV.

Litchfield have collected surface soil and rock chip samples, and together with the historical information, have identified the locations of potential drill sites.

This Environmental Risk Assessment (ERA) examines the key environmental aspects which may be impacted from ground disturbance activities associated with the proposed drill program. Management actions have been identified and will be employed during the preparation of access tracks and drill pads, and the drilling operation, in order to minimise risks to the local environment.

Litchfield considers the overall impact to the local environment from the proposed clearing and drilling works to be negligible.

1.2 Location

The location of the proposed exploration program is contained within Figures 1, 2 and 3.

The proposed exploration works are located within the Mount Doreen Pastoral Station which is 58km northwest of Yuendumu and nearly 350km northwest of Alice Springs.

1.3 General Description

The proposed works is located within the *Burt Plain* Biogeographic Region. The Burt Plain bioregion includes some of Australia’s best developed and most extensive mulga woodlands, and some rocky ranges offering refugial values and limited endemism. It lies over the Arunta Province, Tennant Inlier, and small areas of Georgina, Wiso and Ngalia Basins, with metamorphic, plutonic, and sedimentary rocks of Precambrian age. Soils are shallow sands and massive earths. Elevation across the undulating plains varies from 350 to 1100m in the Reynolds Ranges. The drainage includes several ephemeral rivers flowing north into the Tanami Desert, including the Hanson, Lander Rivers and Yaloogarrie Creek. The climate is arid with annual rainfall between 300 and 400mm.

The Burt Plain is approximately 74,000km² in size of which 82% contains pastoral activity. Only 0.15% of this bioregion has been cleared historically (Department of Natural Resources, Environment and the Arts, 2005).

Figure 1: Regional Location



Figure 2: Tenement Location

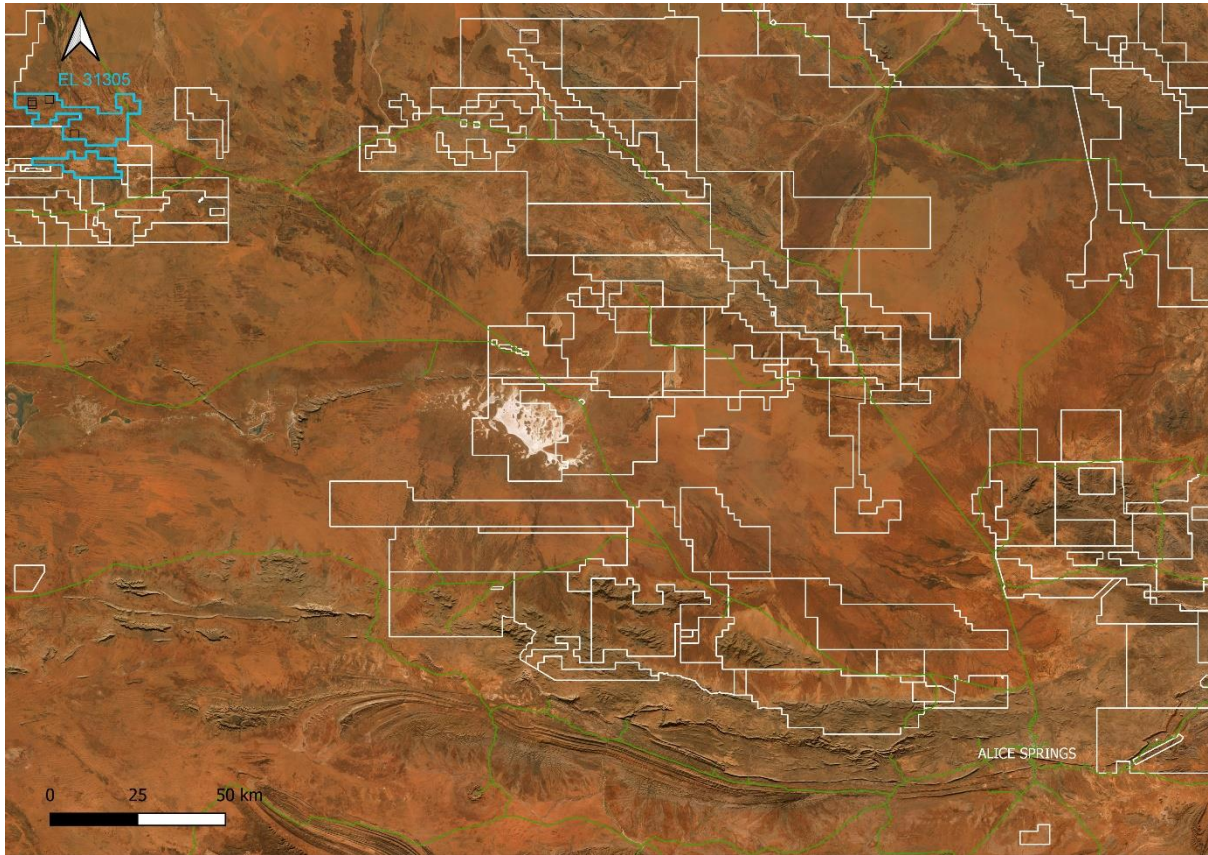
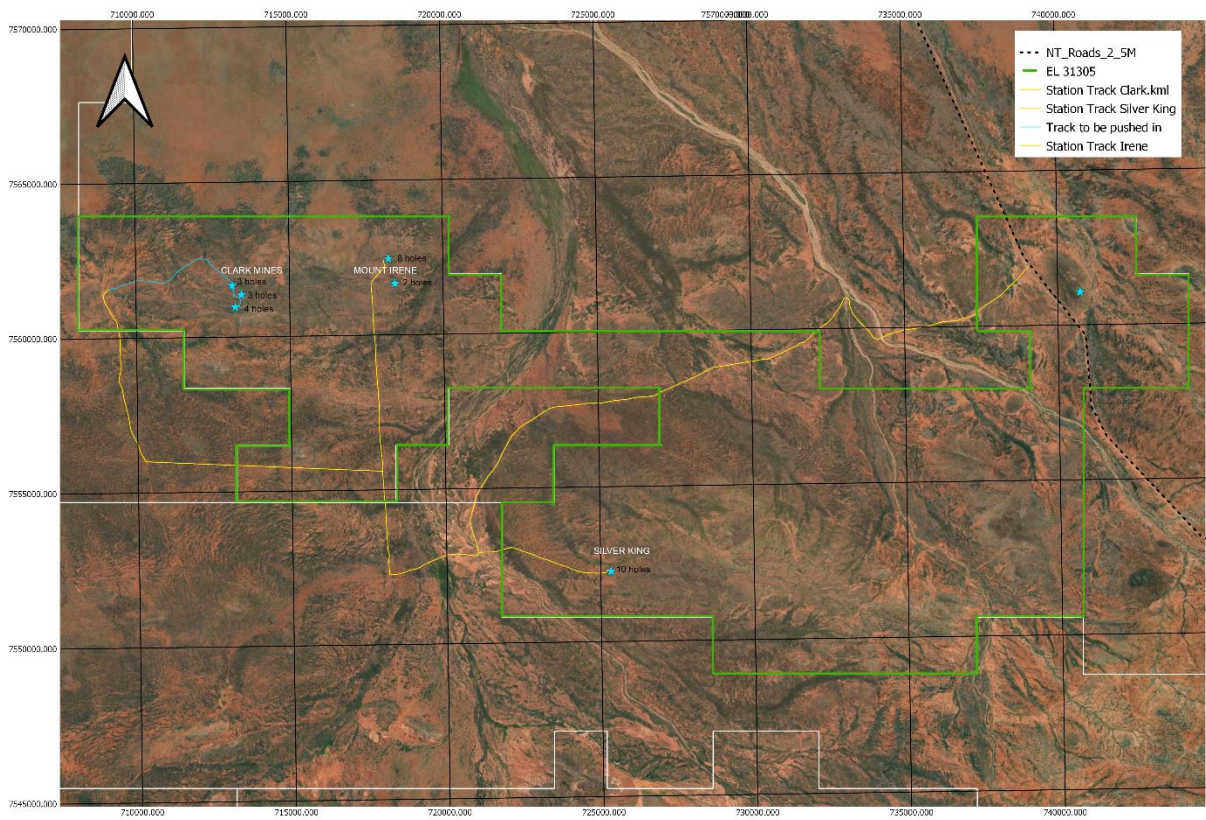


Figure 3: Proposed Drill Holes and Access Tracks



2. Environmental Values

2.1 Vegetation

The proposed project area is not within any sites of Conservation Significance in the Northern Territory (Department of Environment and Natural Resources, 2018). The closest significant conservation sites are located more than 100km to the south (Newhaven Lakes and Lake Lewis and surrounds).

There are a number of other protected areas within the Burt Plain Bioregion, including:

- Anna's Reservoir Conservation Reserve 0.848 km²;
- Barrow Creek Telegraph Station Historical Reserve 0.008 km²;
- Central Mount Stuart Historical Reserve 0.003 km²;
- Dulcie Range National Park 190.7 km²;
- Native Gap Conservation Reserve 0.114 km²; and
- Ryan Well Historical Reserve 0.024 km².

None of these protected areas fall within the proposed drill program area.

The main vegetation types are listed in Table 1 below and are well represented across the Bioregion. Proposed clearing for access tracks and drill pads in the project would therefore have minimal impact to these vegetation types.

Table 1: Broad vegetation types within the Burt Plain Bioregion (DNREA, 2005)

Broad Vegetation Unit	Description	Area (km ²) in bioregion	% reserved in bioregion
3	Eucalyptus low Woodland with Tussock Grass Understorey	2,348	<0.01
4	Eucalyptus Woodland with Hummock Grass Understorey	5,398	3.1
9	Acacia Woodland	48,859	0.05
10	Hummock Grassland	16,640	<0.01
11	Tussock Grassland	359	0

2.2 Flora

2.2.1 Native Species

Out of a total of 971 flora species known to be present within the Burt Plain Bioregion, three species are listed as vulnerable (Table 2) and a further six described as being significant.

Table 2: Significant plant species known to reside within the Burt Plains Bioregion (DNREA, 2005)

Species	NT Conservation Status	Federal Conservation Status	Endemic to Bioregion and/or NT	Restricted area species
<i>Eleocharis papillosa</i>	Vulnerable		NT	
<i>Eremophila dalyana</i>			B	
<i>Ipomoea A83192 Stirling</i>	Vulnerable	Vulnerable	B/NT	1
<i>Macrozamia macdonnellii</i>	Vulnerable	Vulnerable	NT	
<i>Marsilea A99150 Neutral Junction</i>			B	
<i>Scaevola obovate</i>			B	
<i>Sclerolaena desniflora</i>			B	
<i>Sida filicaulis</i>			B	
<i>Zinnia peruviana</i>			B	

Note: B – Bioregion, NT – Northern Territory

These flora species are highly unlikely to fall within the area proposed for drilling and access, given historical disturbance and the primary use of the land being pastoral. Litchfield however, intend to minimise disturbance to as much native vegetation as possible through the use of existing tracks and the utilisation of cleared, more open areas for siting of pads.

2.2.2 Weed Species

There are seven key weed species known to be present in the Burt Plains Bioregion. These are included in Table3.

Litchfield will ensure that weed species are not introduced and/or spread through rigorous cleaning of vehicles and equipment prior to entering the proposed drilling areas.

Table 3: Weed species known to exist in the Burt Plains Bioregion (DNREA, 2005)

Name	NT Weed Classification	WONS	Habitat
Buffel Grass (<i>Cenchrus ciliaris</i>)	Not classed		Disturbed areas, towns, roads, swamp margins
Castor Oil Plant (<i>Ricinus communis</i>)	Not classed		Roads, riparian, flood areas
Mexican Poppy (<i>Argemone ochroleuca</i>)	Growth and spread to be controlled		Blocks and gardens, roads and tracks, waterways and flood plains
Olive Hymenachne (<i>Hymenachne amlexicaulis</i>)	Not classed	WONS	Waterways and flood plains
Paddy's Lucerne (<i>Sida rhombifolia</i>)	Growth and spread to be controlled		Blocks and gardens, pastoral, roads and tracks
Parkinsonia (<i>Parkinsonia aculeata</i>)	Growth and spread to be controlled	WONS	Pastoral, waterways and flood plains, blocks and gardens
Ruby Dock (<i>Acetosa vesicaria</i>)	Not classed		Disturbed areas, towns, roads

Note: WONS – Weeds of National Significance

2.3 Fauna

2.3.1 Native Species

The Department of Agriculture, Water and the Environment *Protected Matter Search Tool* targeting the proposed exploration area has listed nine Threatened Fauna species (Table 4) and nine Threatened Migratory species (Table 5) that may occur in the area.

Table 4: Threatened Fauna species which may occur in the region of the proposed exploration program

Name	Common Name	Class	Likelihood of Occurrence	Threatened Category
<i>Calidris ferruginea</i>	Curlew Sandpiper	Bird	May	Critically Endangered
<i>Rostratula australis</i>	Australian Painted Snipe	Bird	May	Endangered
<i>Pezoporus occidentalis</i>	Night Parrot	Bird	May	Endangered
<i>Falco hypoleucos</i>	Grey Falcon	Bird	Likely	Vulnerable
<i>Polytelis alexandrae</i>	Princess Parrot, Alexandra's Parrot	Bird	Likely	Vulnerable
<i>Macroderma gigas</i>	Ghost Bat	Mammal	May	Vulnerable
<i>Macrotis lagotis</i>	Greater Bilby	Mammal	May	Vulnerable
<i>Petrogale lateralis centralis</i>	Warru, Central Australian Rock-wallaby	Mammal	May	Vulnerable
<i>Liopholis kintorei</i>	Great Desert Skink, Tjakura, Warrarna, Mulyamiji	Reptile	Likely	Vulnerable

Most of the threatened animal species known to exist within the Burt Plains Bioregion are bird species and therefore it is highly unlikely that exploration works will impact these species. In terms of the ground dwelling mammal and reptile species, impact is anticipated to be negligible given the utilisation of existing tracks for access to proposed drill pads, and the limiting of clearing key plant species or potential habitat. We commit that a 300m buffer will be in place around tall trees to mitigate disturbance to species such as the Grey Falcon

Table 5: Threatened Migratory Fauna species which may occur in the region of the proposed exploration program

Name	Common Name	Class	Likelihood of Occurrence	Threatened Category	Migratory Category
<i>Glareola maldivarum</i>	Oriental Pratincole	Bird	May		Migratory Wetlands Species
<i>Calidris melanotos</i>	Pectoral Sandpiper	Bird	May		Migratory Wetlands Species
<i>Motacilla cinerea</i>	Grey Wagtail	Bird	May		Migratory Terrestrial Species
<i>Motacilla flava</i>	Yellow Wagtail	Bird	Likely		Migratory Terrestrial Species
<i>Apus pacificus</i>	Fork-tailed Swift	Bird	May		Migratory Marine Birds
<i>Calidris ferruginea</i>	Curlew Sandpiper	Bird	May	Critically Endangered	Migratory Wetlands Species
<i>Charadrius veredus</i>	Oriental Plover, Oriental Dotterel	Bird	May		Migratory Wetlands Species

<i>Calidris acuminata</i>	Sharp-tailed Sandpiper	Bird	May		Migratory Wetlands Species
<i>Actitis hypoleucos</i>	Common Sandpiper	Bird	May		Migratory Wetlands Species

Given the negligible size of the proposed clearing works and subsequent drilling program, it is highly unlikely that threatened migratory species will be impacted.

2.3.2 Feral Animals

A number of feral animals are known to reside within the Burt Plains Bioregion, including the following:

- Arabian Camel - Widespread and probably increasing; with detriment to vegetation and water sources;
- Cat - Widespread, but probably at relatively low densities: probably substantial impacts on small mammals, reptiles and ground-dwelling birds;
- Cattle – part of the pastoral operation. Widespread;
- Dog - Widespread, but generally not common; impacts upon biodiversity are probably generally minor;
- Donkey – In relatively low numbers;
- Fox - Serious pest, especially affecting small and medium-sized mammals, reptiles and ground-dwelling birds;
- Horse – In relatively low numbers;
- House Mouse - Widespread across much of the bioregion, occasionally in very high numbers; impacts upon biodiversity uncertain; and
- Rabbit - Formerly at very high densities, causing severe environmental detriment: now at least partly controlled

Litchfield have a strict policy on preventing the introduction of pets and non-native animals to the proposed drilling site.

3. Aboriginal Heritage

There are 6 known heritage sites within the tenement boundaries of where Litchfield minerals wish to conduct drilling, however the closest site is 25km away and therefore there will be no impact to sites with ethnographic and/or archaeological significance. The sites include:

- C2019/098
- C2018/056
- C2022/004
- C2015/172
- C2011/212
- C1993/150

4. Risk Assessment

4.1 Potential Impacts

Litchfield have identified a number of potential risks that may impact the environment (eg. vegetation habitat, flora, fauna, soil, surface and groundwater), including:

- Establishment of access tracks;
- Establishment of drill pads for drill rigs and associated plant/equipment;
- Potential intersection of groundwater through the drilling process and potential for contamination;
- Sample bags and other waste;
- The introduction and spread of weeds; and
- Hydrocarbon storage and management and hydrocarbon leaks and spills.

This risk assessment outlines management and remediation actions that will be implemented by Litchfield to ensure that potential impacts to the environment from the proposed clearing and drilling works, will be minimised.

4.2 Risk Assessment

An Environmental Risk Assessment was conducted for the proposed works in accordance with *AS/NZS ISO 31000:2009 Risk Management – Principles and Guidelines* (Standards Australia, 2009). The environmental risks listed above have been given a rating in terms of likelihood of occurring and the subsequent consequence. These ratings are summarised in Table 6 and Table 7.

Table 6: Risk Matrix

		Consequence		
		Low (1) (little to no impact)	Medium (2) (medium term negative impact)	High (3) irreversible or long-term impact)
Likelihood	High (3) (>75% chance event will occur during the proposed works)	3	6	9
	Medium (2) (25-75% chance event will occur during the proposed works)	2	4	6
	Low (1) (<25% chance event will occur during the proposed works)	1	2	3

Table 7: Environmental Risk Rating Definitions

Low	No significant action or further assessments required. Managed under existing operational controls. Some mitigation may be required but generally addressed using standard management measures and routine controls
Moderate	Mitigation required. Managed under existing operational controls.
High	Substantial mitigation required. Assessment of required factors and aspects and management using specific measures and controls
Extreme	Potentially unacceptable. Urgent management and mitigation action required.

Table 8: Environmental Risk Assessment and Management and Remediation Actions

Aspect	Potential Impact	Likelihood	Consequence	Inherent Risk Rating	Management Measures (prevention)	Management Measures (remediation)	Likelihood	Consequence	Residual Risk Rating
Native vegetation disturbance	Damage to native vegetation	3	1	M (3)	The drill pads and access tracks proposed for the program are located within an area that has had a high level of exploration and mining historically. Therefore, vegetation is not of the highest quality. To minimise impact to residual vegetation, it is planned that existing tracks be utilised where possible, as well as locating new tracks in naturally cleared areas between trees. Drillers will be made aware of the significance of vegetation and fauna habitats during initial inductions.	Where new tracks and pads will need to be cleared, loaders using a 'blade-up' technique will be utilised to ensure that impact to topsoil is minimised, allowing for a greater chance of quick regeneration of plant species from insitu root systems. Where continued use of vehicle pathways results in compaction of soil on these tracks, the impacted areas will be scarified after use to encourage the regeneration of vegetation. If vegetation has been physically removed from tracks and drill pads, this vegetation will be pulled back over cleared areas where possible, once the program has ceased.	1	1	L (1)
Soil disturbance	Erosion of soil	2	1	L (2)	The drill pads for this program will preferably be located in naturally clear areas and as such, vegetation species will not require clearing in these areas. Drill pads will not be located within riparian zones. This greatly reduces the potential impact of the drilling in terms of soil disturbance, vegetation disturbance, and fauna habitat disturbance to wetland or watercourse ecology. New access tracks are locally required to undertake the proposed drill program. The tracks are planned to begin at existing tracks and/or public roads. The new tracks are located along routes designed to have the minimum impact to the natural environment, as determined from imagery and from field reconnaissance. The tracks are designed to avoid, when possible, steep topography and large or significant vegetation. The tracks will largely be simple flattened paths clear of upright vegetation, however, if vegetation is thick and not responding to flattening techniques, it may be necessary to physically remove specific vegetation off the track route. The tracks will not be graded or have topsoil cleared/removed. Vehicle speeds will be restricted (variant on style and condition of track). It is believed that by utilising these techniques the program will have only minor disturbance to the soil profile from proposed new tracks and drill pads. Where soil is disturbed due to earthworks activities, topsoil will be separately stockpiled adjacent to where it was collected. Speed restrictions will be implemented on all tracks to avoid 'bulldust' being generated. In the event of heavy rain, works will cease to prevent damage to tracks, soils and vegetation.	By utilising naturally clear pathways and avoiding soil disturbance during construction of the new tracks, it is planned that little to no scarification will be necessary during rehabilitation. However, if it is deemed necessary and beneficial, tracks and drill pads will be scarified. Where topsoil may be stockpiled, this will be returned to the areas of origin once the program has been completed. Tracks will be blocked by vegetation (where available) to discourage future use by the general public.	1	1	L (1)
Scientific and cultural sites	Disturbance to, or destruction of sites of cultural or scientific interest	2	3	H (6)	There are no known recorded Aboriginal cultural heritage sites within the proposed exploration footprint. The closest site is c. 25km away. Drillers will be made aware of the significance of cultural heritage during initial inductions.	N/A	1	3	L (3)
Fauna disturbance	Disturbance of vulnerable or endangered fauna	1	2	L (2)	A desktop search for rare and threatened fauna has been conducted which identified 9 species potentially known to reside within the area. Given the proposed clearing footprint for tracks and drill pads are located within historical exploration and mining areas, it is considered unlikely that suitable habitat is present for these species to be present. In addition, no clearing for tracks or pads will occur along watercourses or drainage lines or on land of significant relief. Trees or large shrubs will be avoided and not cleared where possible. Drillers will be made aware of the significance of rare and threatened fauna species during initial inductions.	Once exploration has ceased, pads and tracks will be rehabilitated in a way to encourage quick regeneration of plant species and therefore potential suitable habitat for fauna species.	1	2	L (2)
Flora disturbance	Disturbance of vulnerable or endangered flora	2	2	M (4)	A desktop search for rare and threatened flora has been conducted which identified 3 vulnerable and 6 significant species potentially known to reside within the area. Given the proposed clearing footprint for tracks and drill pads are located within historical exploration and mining areas, it is considered unlikely that these plant species will be present. In addition no clearing for tracks or pads will occur along watercourses or drainage lines or on land of significant relief. Where possible, access tracks and drill pads will be located on areas that are cleared or partially cleared already, taking care to avoid larger tree and shrub species. Drillers will be made aware of the significance of rare and threatened flora species during initial inductions.	Once exploration has ceased, pads and tracks will be rehabilitated in a way to encourage quick regeneration of plant species.	1	2	L (2)

Visual impact	Evidence of vehicles outside of designated areas	1	1	L (1)	All clearing and exploration activities are well off main roadways and not visible to the general public. The land is privately owned and subject to an agreed Land Access Agreement, which stipulates that access tracks and pads will be utilised for exploration activities only. There are no residences within 20 km of the proposed exploration area.	N/A	1	1	L (1)
Fire	Fire damaging the environment and injuring people	2	3	H (6)	The fire risk from the proposed program is likely to be minimal. Much of the local and regional area has been burnt through the regular burning regime of the Bushfires NT (Government). However, if proposed work areas have not been burnt, there is a higher risk of a wild fire starting in the area (generally by members of the public), resulting in a threat people, equipment and local ecology. Drilling operations will cease on total fire ban days, unless the area has previously been burnt and no grass fire risk exists. No vehicles with petrol engines will be allowed on site, other than ATV's and quadbikes with sufficient fire control measures in place. This will reduce the chances of a fire starting. All vehicles will carry fire extinguishers and shovels. Vehicles and equipment will be parked on open ground when not in use.	For non-emergency situations call NT Emergency Services 24-hour call 131 444 For information on controlled burns call Bushfires NT: - Darwin office (08 8922 0844)	1	3	L (3)
Groundwater contamination	Contamination of fresh aquifers with saline aquifers	1	3	L (3)	There is little or no cross contamination of aquifers expected during this program, as all groundwater is in tight fracture-controlled situations.	If significant aquifers are encountered, cement plugs will be placed between and above aquifers to preserve the integrity of the seals.	1	3	L (3)
Surface drainage interference	Disturbance to natural drainage systems from erosional events	1	3	L (3)	The proposed exploration area only has minor low-order surface drainage with no significant or steeply banked drainage systems. No clearing will occur within 25m of any significant drainage features.	Once exploration has ceased, pads and tracks will be rehabilitated in a way to encourage quick regeneration of plant species and to minimise chances of erosion during the wet season.		3	L (3)
Weeds	Introduction and spread of weeds from vehicles and equipment	2	2	M (4)	Induction processes prior to works commencing will inform drillers of potential weed species and management actions to prevent their introduction and spread. All vehicles and rigs entering the site will be weed-free certified prior to entry.	The proposed disturbance area will be monitored during works to ensure that weeds have not been introduced or are growing in newly clear tracks and pads	1	2	L (2)
Feral animals	Introduction of non-native species which will impact the environment	1	2	L (2)	Feral animals or pets will not be allowed to be brought onto site by anyone related to the proposed drill program. Drillers will be made aware of the significance of feral species and the impact to the environment during initial inductions.	N/A	1	2	L (2)
Rubbish and waste	Contamination of the environment with rubbish and waste	2	3	H (6)	Drillers will be made aware of the significance of managing waste and the impact to the environment that rubbish can have, during initial inductions.	All rubbish at drill locations to be collected and removed from site prior to departure.	1	3	L (3)
Landowner activities/interests	Disturbance to landowner activities/assets	2	2	M (4)	Site access will proceed via a Land Access Agreement between Litchfield and the landowner.	The site will be returned to a state that is approved by the landholder and forms part of the Land Access Agreement.	1	2	L (2)
Fuel storage	Hydrocarbon leak/spill resulting in contamination of soil, surface and groundwater	3	2	H (6)	No refuelling of vehicles or large equipment within 50m of any water source. Hydrocarbon spill kits to be maintained by drillers and kept in the vicinity of the drilling operation. Fuel tanks will be filled via mobile refuelling. No fuel is to be kept onsite. Drillers will be made aware of the significance of hydrocarbon spills and the impact to the environment during initial inductions.	Any soil contaminated with hydrocarbons from spills or leaks will be bagged and removed and disposed of at an appropriate licenced facility. All leaks or spills over 50L will be recorded as an environmental incident and will form part of the close-out reporting to the Department.	1	2	L (2)
Air quality	Potential for excessive dust that impacts the environment	3	1	M (3)	Water based dust suppression on access tracks and drill pads will be employed as required.	N/A	1	1	L (1)
Public or third party activities	Disturbance of public activities. Unauthorised access to drill sites causing damage to the environment	1	2	L (2)	The land is privately owned and access subject to landowner consent. Litchfield will ensure that all gates are left in the position that they were found in and that any landowner plant or equipment is respected and not touched.	N/A	1	2	L (2)

5. Remediation

The proposed clearing areas will be remediated as per the management actions in Table 8. Works done to close-out once drilling has ceased will be reported to the Department once completed in the form of a Remediation Report.

6. References

Department of Natural Resources, Environment and the Arts (2005). Northern Territory Bioregions – Assessment of Key Biodiversity Values and Threats.

Department of Environment and Natural Resources (2018). Product Catalogue – Flora and Vegetation.

Standards Australia (2009). *AS/NZS ISO 31000:2009 Risk Management – Principles and Guidelines*.

