EXPLORATION OPERATIONS MINING MANAGEMENT PLAN AND PUBLIC REPORT

INDEPENDENCE GROUP NL

LAKE MACKAY PROJECT

AUTHORISATION NUMBER:0815-01

2017

23 FEBRUARY 2017

Distribution: DPIR, CLC

	Author	Reviewed by	Approved by
Date	23/2/2017	23/02/2017	
Name	DOUG WINZAR	SIMON CORNELL	
Signature	Doug Winzar		

I *Matt Dusci, Chief Growth Officer* 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: 23/02/2017

Contents

List of Figures

List of Tables

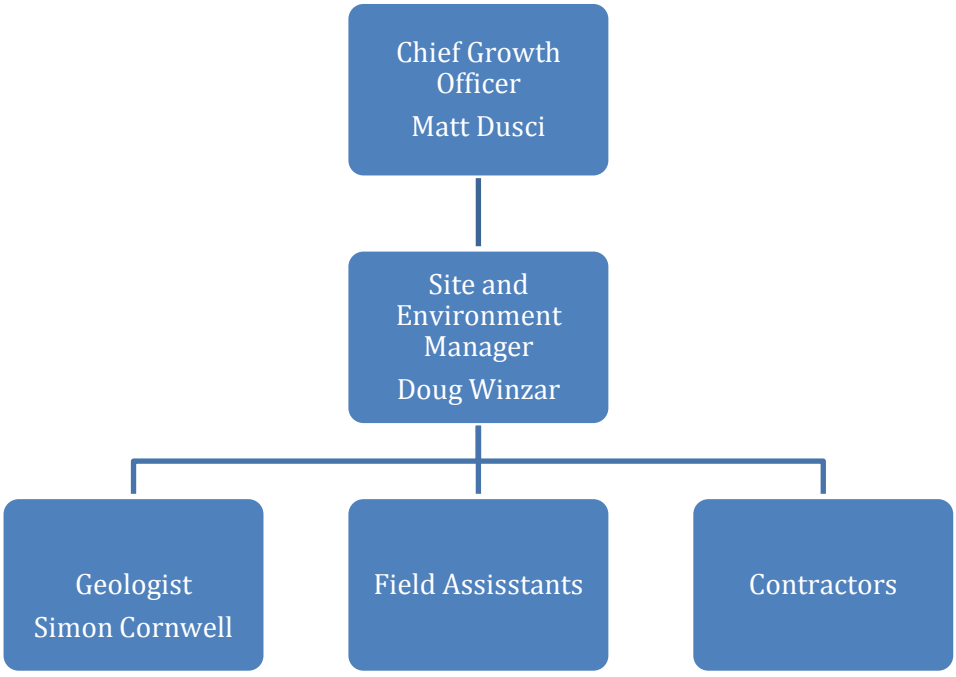
Amendments

Section	Amendment
Section 1. – Operator Details	Change in Matt Dusci job title (p. 5)
Section 1.1- Organisational Stucture	Change job title from General Manager- New Buisness to Chief Growth Officer (p.5 and 6). Added names and environment manager to the chart (p5) Specified on site environmental management responsibility (p6)
Section 1.2-Workforce	Changed year (p7)
Section2.2- Land claimants	Included date and location of meeting.
Section 2.5- Government Departments	Updated department names (p8)
Section 3- Project Details	Added authorization number (p8)
Section 3.1-Previous activities and current status	Included 2014 activities for EL24915 and updated the 2016 activities and Table2. (p9)
Section 3.2- Proposed activities	Updated text and Table 3 (pp9,10)
Section 4.3- Hydrology	Updated text (p11)
Section 4.5- Fauna	Removed Red Goshawk from Threatened Species list
Section 4.6- Land use	Updated year (p 13)
Section 5.1- Environmental policy and responsibilities	Updated text (p 13)
Section 5.3- Induction and training	Updated text (p 14)
Section 5.4.1- Risk assessment	Updated text (p 15)
Section 5.4.2.1- Water management	Updated consumption figures in text and government department in Table 9. (p21)
Section 5.4.2.2- Air quality and noise management	Updated government department in Table 10.(p22)
Section 5.4.2.3- Ground disturbance management	Updated government department in text and Table 11. (pp22,23)
Section 5.4.2.4- Fauna management	Updated government department in Table 12 (p24)
Section 5.4.2.5- Weed management	Updated government department in text and Table 13 (pp 24,25)
Section 5.4.2.7- Hazardous materials management	Updated text to specify storage requirements for different activities. Updated government department in Table 15. (p 27)
Section 5.4.2.8- Fire management	Updated government department in Table 16. (p28)
Section 5.5 Environmental audits, inspections and monitoring	Removed the reference to completed rehabilitation on other tenements that was approved. (p29)
Section 5.6.2- Performance reporting	Updated text to cover the 2016 performance. (pp 29,30)
Section 6- Exploration rehabilitation	Updated government department in text. (P31)
Section 6.1- Exploration rehabilitation register	Updated table to cover activities in previous MMP period. (P32)
Section 6.2- Costing of closure activities	Updated the year and Table 19 to reflect proposed activities. (P33)

1 Operator Details

Operator Name:	Independence Group NL (ABN 46 092 786 304)
Key Contact Person/s:	Matt Dusci, Chief Growth Officer- Matt.Dusci@igo.com.au Doug Winzar, Project Manager- Lake Mackay- Doug.Winzar@igo.com.au
Postal Address:	P.O. Box 496 South Perth, WA 6951
Street Address:	Suite 4, Level 5 South Shore Centre 85 South Perth Esplanade South Perth WA 6151
Phone:	08 9238 8300
Fax:	08 9238 8399
Email:	contact@igo.com.au or sue@mmwc.com.au

1.1 Organisational Structure / Chart



Chief Growth Officer is responsible for:

- strategic direction and operational planning of the exploration department
- policy
- promotion of values and expectation
- provision of resources
- HSE performance.
- promoting HSE awareness
- training

The Site and Environment Manager is responsible for:

- implementation of HSE plan
- promoting HSE awareness at the workplace
- environmental management of the work program
- safe and environmentally responsible work practices, plant, equipment and resources
- engagement of competent personnel and contractors
- provision of plant, equipment and resources
- workplace inspections
- hazard identification and assessment
- personal protective equipment
- consultation, communication and workplace monitoring

The Geologists, field assistants and contractors are responsible for:

- observing HSE rules
- working in a safe and environmentally responsible manner
- maintaining plant
- identifying and reporting incidents and hazards
- training
- cooperating with supervisors
- participation in HSE programs and meetings
- eliminating hazards
- inspection of workplace, plant equipment and materials
- presenting fit for work

1.2 Workforce

During the 2017 program the workforce will be comprised of a core group of Independence Group (IGO) employees and specialized contract staff depending on the exploration activity.

The main focus for this year will be on ground geophysics, airborne geophysics and drilling. IGO has a dedicated ground EM crew. Any other ground geophysics will be conducted by a geophysical contracting company.

All drilling is contracted out to a drilling company with IGO providing a site manager/geologist and senior field assistant to log and sample the material.

XM logistics will be utilized for the provision of any additional exploration equipment and personnel to the soil sampling, ground geophysics and drilling programs. They have been involved on the Lake Mackay project for the past 4 years.

At this stage the drilling and geophysical contractors have not been selected.

Current staffing estimates are:

- Ground EM: 4 IGO staff, 1 contractor
- Ground gravity: 5 contractors
- Soil sampling: 1 IGO staff, 2 contractors
- Track clearing: 1 IGO staff, 2 contractors
- Drilling: 2 IGO staff, 5 contractors

2 Identified stakeholders and consultation

2.1 Lease Owner

ABM Resources NL

2.2 Land Claimants

ABM has entered into an Exploration Agreement with the CLC on behalf of the Traditional Owners of the area.

IGO deals with all Native Title and Heritage matters through the CLC with consent from ABM. A meeting was held at Desert Bore on 9 June 2016 to provide an update on the status of the project and to discuss the type of work that is planned for adjoining tenement application areas once they are granted.

2.3 Neighbours and Communities

The community of Kintore is located approximately 40km southwest of EL24915. This will be used as a source of occasional fuel and other supplies.

2.4 Tenement Managers

M & M Walter Consulting

Suite 1, 159 York Street

SUBIACO WA 6904

2.5 Government Departments

Department of Primary Industry and Resources (DPIR), Department of Environment and Natural Resources (DENR), NT Work Safe and Department of Health.

3 Project Details

Table 1: Project Details

Authorisation:	0815-01
Project Name:	Lake Mackay
Location:	EL24915 is located 400km west-north-west of Alice Springs (Figure 1).Access is via the Stuart Highway, Tanami Road and Gary Junction Road to Sandy Blight Junction, then along the graded road to the north.
Site Access:	Temporary access tracks were put in to gain access from the Central Petroleum turnoff in the east and from the Sandy Blight Junction Nyirripi Track to the west.
Mining Interest:	EL24915
Title holder/s:	ABM Resources NL

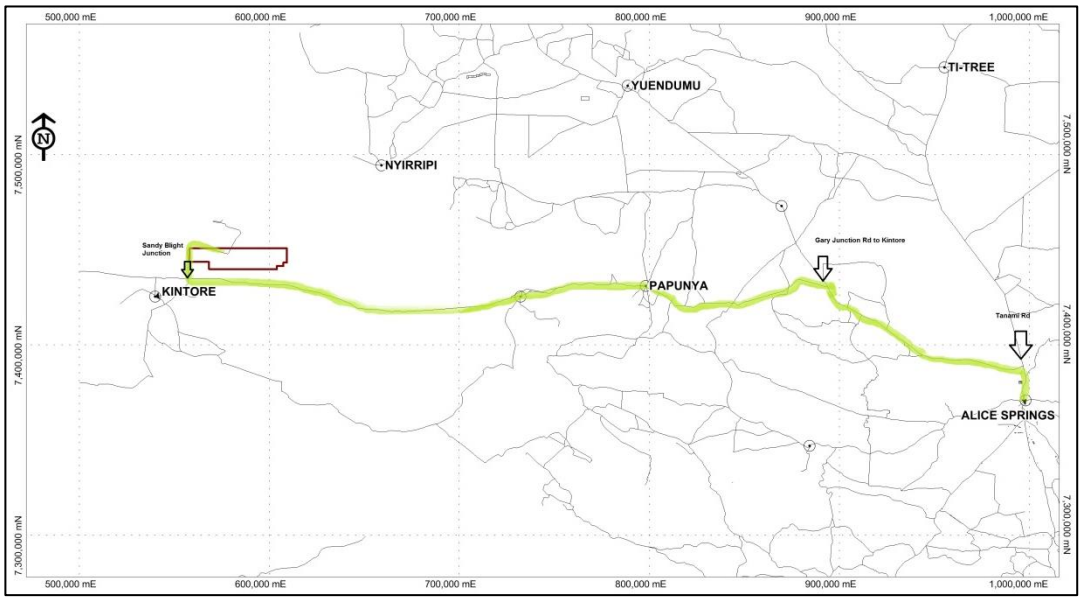


Figure 1: Site location showing access from Alice Springs (GDA94, Zn 52)

A site location and layout A4 Map at 1:200,000 scale is provided in Appendix 1.

3.1 Previous activities and current status

In 2014 first pass reconnaissance soil sampling was completed over EL24915. This involved the collection of 812 soil samples and 6 rock samples. This returned anomalous results in several locations.

In 2015 an extensive exploration program was undertaken on EL24915. This involved the collection of 1430 soil samples and 128 rock samples, the drilling of 89 holes and regional geological mapping.

In 2016 exploration involved the collection of 4 rock samples, 341 soil samples, the drilling of 28 holes (26 exploration, 2 water) and 90.8 line kilometers of Moving Loop Electromagnetics (MLEM). A summary of the drill rehabilitation status is shown in Table 2. All drill collars are plugged upon completion of the drilling. At this stage 22 holes have received full rehabilitation. This involves capping the hole below ground level and burying all drill spoil. 76 of the holes have had the collar capped below surface and still require the drill spoil to be buried and/or or surface rehabilitated. 18 have had the collars temporarily plugged at surface and require full rehabilitation. The water bore has been established with a steel collar cemented in placeThe sample spoil was left on the surface where RC drilling was undertaken. No plastic bags were used. Access was along temporary cross country tracks. Mechanized clearing was done for the final 1 kilometer of the Bumblebee access track and for five drill pads at the Bumblebee Prospect that involved the excavation of sumps. The five sumps that were excavated for the diamond drilling have all been backfilled.. The remaining 98 drill pads are located on the four active prospects and will be rehabilitated when exploration activities have been concluded at these locations. The rehabilitation is not done immediately in case additional sampling of the drill spoil is required, or the pad is likely to be utilized again for additinal drill holes. The drill hole coordinates are provided in Appendix 2.

Table 2: EL24915 ground disturbance summary

Tenement	Holes drilled	Max Depth (m)	Collar Rehab	Drill Spoil Buried	Temporary Cross Country Access in use (km)	Cleared Access (km)
EL24915	117	279.7	98	22	108.2	1.0

3.2 Proposed activities

The focus for the next twelve months is to continue the testing of the Bumblebee, Grapple, Springer and Prowl prospects and to detect additional prospects with the use of airborne and ground geophysics and limited soil sampling. The positioning of drill holes will be determined once the geophysics has been completed.

The drill testing of the existing prospects within EL24915 is planned to utilize a multi-purpose RC and diamond drill rig. Additional prospects would be tested with a dedicated RC rig unless the multi-purpose rig is on site at the time.

Table 3: Summary of Proposed Exploration Activities

Mining Interests	Lake Mackay Project
What time of the year will exploration occur?	March - November
How long is exploration expected to occur?	March-November
Type of drilling	RC, Diamond
Target commodity	Gold (Au), Copper (Cu)
Is drilling likely to encounter radioactive material?	No
Number of proposed drill holes	12 Diamond, 40 RC
Maximum depth of holes	600m
Number of drill pads (Length: x Width: m)	52 pads (1.74 ha) 12 Diamond: 30m x 15m 40 RC:30m x 10m
Is drilling likely to encounter groundwater?	Yes
Number of sumps 5m (L) x 3m (W) x 2 m (D)	12
Length of line / track clearing	10km Temporary cross country access tracks (3 ha)
Number of costeans (Length: x Width: x Depth:. m)	N/A
Total bulk sample (tonnes) (Length: x Width: x Depth: m)	N/A
Will topsoil be removed for rehabilitation purposes?	No
Previous disturbance yet to be rehabilitated on title (ha) if known	95 drill pads. (1.52 ha) 109.2km temporary tracks. (32.76 ha). 1.0km cleared track (0.3 ha)
Camps	Temporary camps to be established as close to the drill sites as practicable in naturally clear areas.
Total area disturbed (hectares)	39.32
Other:	N/A

4 Current project site conditions

4.1 Geology

The Lake Mackay area is part of the Arunta region, a Proterozoic domain covering a large part of central Australia. The Arunta region is very complex due to the superposition of numerous depositional, magmatic, metamorphic and tectonic events.

The Lake Mackay area comprises strongly deformed and variably metamorphosed siliciclastic sediments which were deposited between 1840 and 1800Ma. These metasedimentary rocks have been assigned to the Lander Group, which is interpreted to be laterally equivalent with the Tanami Group.

The project area contains Dufaur Suite amphibolites and lithogeochemistry has confirmed these are metamorphosed low K Tholeiites formed in an extensional environment. These have not been dated but they may have been intruded during the Stafford Event between 1820 and 1790 Ma (Scrimgeour IR, 2013).

Mafic and felsic intrusives within the project area are considered to be part of the Andrew Young Igneous Complex. A weakly foliated granite has been dated at 1640±6 Ma which is a similar age to the Gabbronorite at Andrew Young Hills dated at 1635± 9 (Scrimgeour IR, 2013).

4.2 Land System

The Lake Mackay project falls into the Great Sandy Desert Bioregion and comprises predominantly semi-arid sand plain with sand dunes through the project area. Moderate relief in the form of hills and rocky outcrops occurs sporadically throughout the project area.

4.3 Hydrology

Two planned water bores were drilled in May 2016. 16LMWB001 intersected water at 18m and was drilled to 60m. This has been established in accordance with the Minimum Construction Requirements for Water Bores in Australia and is registered as RN 19124. 16LMWB002 failed to intersect suitable water and was abandoned at 48m. This hole has been rehabilitated.

Name	Easting m (GDA94 Zn 52)	Northing m (GDA94 Zn 52)
16LMWB001 (RN19124)	588300	7450498
16LMWB002	593067	7446071

4.4 Flora

An extensive E-W oriented dune field covers 70% of the project area. The majority of the project area, including the dune field, is dominated by Eucalyptus and acacias over spinifex on sand. Mallee trees over spinifex on gravelly rises are present in areas with shallow sand cover and scattered outcrop. A desktop search (Appendix 3) using the Australian Government Department of the Environments' Protected Matters Search tool highlighted no threatened flora species. This identified Buffel Grass (Cenchrus ciliaris) as a weed likely to occur within the project area.

4.5 Fauna

At this stage of exploration, IGO has not undertaken any targeted surveys of flora and fauna in the Lake Mackay project area as the level of disturbance to be generated in this current work proposal is minor.

The 11 threatened species listed below are from the Protected Matter Search in Appendix 3.

Birds:

Night Parrot (Pezoporus occidentalis)

Princess Parrot (Polytelis alexandrae)

Migratory Birds:

Fork-tailed Swift (Apus pacificus)

Great Egret (Ardea alba)

Oriental Plover (Charadrius veredus)

Oriental Pratincole (Glareola maldivarum)

Rainbow Bee-eater (Merops ornatus)

Grey Wagtail (Motacilla cinerea)

Yellow Wagtail (Motacilla flava)

Mammals:

Greater Bilby (Macrotis Lagotis)

Reptiles:

Great Desert Skink (Liopholis kintorei)

Only two introduced fauna species have been observed in the Lake Mackay project area. There have been numerous observations of camels and one observation of a cat. The red fox may possibly be present.

Information and pictures on the threatened mammal and reptile are provided in the Induction documents in Appendix 4. If a threatened species is suspected or identified the area should be avoided. It needs to be reported to the Department of Mines and Energy (DME) as soon as possible; if possible take a picture and GPS coordinates of the finding.

4.6 Land use

The Aboriginal Traditional Owners for the project area are the Kukatja, Warlpiri and Pintupiluritju people. All of the project falls under Aboriginal Land and is held as inalienable freehold title under the Aboriginal Land

Rights Act 1976 (ALRA 1976). Aboriginal rights and interests in land are also recognised under the Commonwealth Native Title Act 1993 (NTA 1993). The NTA 1993 gives Aboriginal people the right to negotiate in regard to 'future acts' on their land and the ALRA 1976 gives Aboriginal people a right of veto for mining projects.

IGO recognises and respects the rights of the Traditional Owners and before any activity is carried out on-ground consults with, and submits work programs to, the Central Land Council (CLC) for Sacred Site Clearances and their approval. All versions of this and other IGO Mining Management Plans are first sent to the CLC for their overview and instruction. The CLC has been made aware of our intention to carry out the 2017 exploration program.

4.7 Historical aboriginal heritage sites

The most recent Sacred Site Clearances Certificate was issued by the CLC on 22 April 2016. The proposed areas in which activities are to be conducted do not contain any sacred or archaeological sites. As the Central Land Council (CLC) has requested that the sacred site surveys cannot be released or discussed. IGO is unable to provide the Sacred Site Clearance Certificate survey data. If this information is required the Department of Mines and Energy needs to consult directly with the CLC. This MMP has been submitted to the CLC for review and comment.

IGO has discussed the lack of an Aboriginal Areas Protection Authority (AAPA) certificate with ABM, the current tenement holder. They are fully aware that it does not have an authority certificate, however as the CLC are not prepared to release information to the AAPA a certificate issued by the AAPA cannot be gained.

5 Environmental management system/plan

The Lake Mackay Project will be managed in accordance with the Independence Group NL General Health, Safety and Environmental Management Plan (HSEMP) August 2016, (Appendix 5).

5.1 Environmental policy and responsibilities

The IGO Environmental Policy is contained within the HSEMP (Appendix 5). The Site and Environment Manager is responsible for implementing environmental management at the Lake Mackay Project.

5.2 Statutory and non-statutory requirements

5.2.1 Statutory requirements

IGO will, at all times, comply with the following Acts and Regulations:

- Mining Management Act
- Mining Management Regulations
- Mineral Titles Act
- Mining Regulations
- Weeds Management Act
- Bushfires Act
- Heritage Act
- NT Aboriginal Sacred Sites Act
- Native Title Act
- Aboriginal Land Rights (Northern Territory) Act

- Environmental Protection & Biodiversity Conservation Act
- Workplace Health and Safety (National uniform Legislation) Act
- Plant Health Act
- Plant Health Regulations

IGO also has annual statutory reporting obligations with respect to exploration activities.

There are also various Exploration Lease conditions that IGO must meet.

5.2.2 Non-statutory requirements

ABM is a signatory to the "Lake Mackay D" Deed for Exploration with the Central Land Council.

ABM and Independence Group NL ("IGO") entered into a multi-phase agreement covering the Lake Mackay Project on 21 August 2013. The agreement originally covered 21 granted exploration licenses. This has recently been modified to cover EL24915 and adjoining tenement applications.

IGO is presently earning a 70% interest in the project by spending $6 Million on exploration on the project over 4 years from 5 May 2016.

5.3 Induction and training

All IGO employees and contractors will undergo a site specific induction at which the company's health, safety, environmental and emergency procedures will be explained, and the responsibilities and obligations of employees and contractors outlined. A copy of the induction is provided in Appendix 4.

Should additional, site specific environmental issues arise during exploration activities e.g. a specific noxious weed is identified, further instruction on dealing with these matters will be determined.

5.4 Identification of environmental aspects and impacts

A list of the environmental aspects and impacts identified for the project by ABM previously is provided below in Table 4. An assessment of the risk of each of these aspects/impacts is provided in Section 4.6.1 and Environmental Management Plans (EMPs) are provided in Section 4.6.2.

Table 4: Aspects and potential impacts associated with proposed activities

Aspect	Potential Impact/Hazard
Storage & handling of hazardous materials (e.g. hydrocarbons).	Spill or leak to environment with potential to contaminate downstream surface and/or ground waters.
Operation of vehicles, plant and equipment.	Degradation in air quality, including generation of excessive dust.
	Disturbance to fauna and/or people associated with excessive noise and vibration.
Clearing of native vegetation and/or soil disturbance.	Loss of key native vegetation habitats and/or direct mortality of terrestrial vulnerable species
	Poorly managed clearing practices and site hygiene practices, leading to incursion by weeds.
	Soil erosion and sedimentation.
Disposal of putrescible	Poorly managed site encourages use by feral animals.

Aspect	Potential Impact/Hazard
and general waste.	Contamination to land and water.
Lighting of fires (accidental / intentional).	Direct mortality of native vegetation and significant terrestrial fauna species. Loss or impact to human health and/or infrastructure.
Rehabilitation activities.	Poorly designed and constructed rehab can lead to erosion, sedimentation and weed establishment.

5.4.1 Risk assessment

This environmental risk assessment was previously conducted by ABM and it was considered suitable for the continuing exploration that is being undertaken this year7. The risk assessment describes the process and presents results of an assessment of the risks associated with identified aspects and potential impacts of the Lake Mackay Project. It is designed to identify the potential hazards that affect human health, the socio-cultural environment, and the natural environment. The approach is systematic and congruous with international best practice standard methodologies including;

- AS/NZS ISO 31000:2009: Risk management – Principles and Guidelines (Standard)
- HB 203:2006: Environmental risk management – Principles and process (Guide)
- HB 158:2010: Delivering assurance based on ISO 31000:2009 – Risk management – Principles and Guidelines (Guide)

IGO will submit a separate health and safety risk management plan prior to commencing field activities in 2017.

5.4.1.1 Risk assessment methods

Risk is defined as the chance of something happening that will have an impact on objectives. The first step in the risk assessment process was to identify the hazards (defined as anything that will cause harm and can affect meeting of outcomes and objectives). Each hazard was analysed for likelihood and consequence and a risk ranking was developed for the inherent value. Management programs were considered for each hazard and a new likelihood, consequence and risk ranking (now the residual risk) was defined.

The ranking for event consequence is shown in Table 5. The likelihood of an event occurring provides a measure of the known or anticipated frequency of occurrences (Table 6). Combining likelihood with consequence provides guidance on risk levels of each aspect and enables ranking of priorities (Table 7).

Consequence		
1	**Insignificant**	No measurable impact on the environment. No injuries. Low-nil financial loss.
2	**Minor**	Minor, temporary environmental impact. No publicity likely and no stakeholder concerns. First aid treatment required. Medium-low financial loss.
3	**Moderate**	Substantial temporary or permanent minor, localised environmental damage. Stakeholder enquires (this may include government, unions or public). Medical attention required. High-medium financial loss.
4	**Major**	Substantial or permanent environmental damage. Prosecution possible. Loss of company credibility and high stakeholder interest. Permanent injuries. High financial loss.
5	**Catastrophic**	Widespread severe and permanent Environmental damage. Major stakeholder and media interest. Prosecution likely. Permanent injury or death. Extreme financial loss.

Table 5: Consequence ranking.

Probability/Likelihood			Likelihood Criteria
A	**Rare:**	Practically impossible, will only occur in exceptional circumstances. Has never occurred in the industry.	0-1%
B	**Unlikely:**	Could occur at some time but highly unlikely. Has occurred in the industry previously.	1-10%
C	**Moderate:**	Might occur at some time. Has occurred in associated companies previously.	11-50%
D	**Likely:**	Known to occur or will probably occur in most circumstances**.** Has occurred several times/year in associated companies.	51-90%
E	**Almost Certain:**	Common or repeating occurrence. Is expected to occur several times/year in any associated business.	91-100%

Table 6: Qualitative measures of likelihood.

Likelihood	Consequence					
		1	2	3	4	5
	A	1	3	6	10	15
	B	2	5	9	14	19
	C	4	8	13	18	22
	D	7	12	17	21	24
	E	11	16	20	23	25

Where;

Red =	extreme risk	intolerable
Purple =	high risk	intolerable or tolerable
Yellow =	medium risk	tolerable or acceptable
Green =	low risk	acceptable

Table 7: Risk rankings from combined consequence to likelihood

5.4.1.2 Risk assessment results

The results of the assessment conducted by ABM of the risks associated with the identified environmental aspects and potential impacts associated with the project are summarised in Table 8 below, including residual risk, taking into account proposed management/mitigation measures. Risk mitigation measures are outlined in more detail in Section 5 Environmental Management Plans.

Table 8: Environmental risks and mitigation measures

Subject	Aspect	Potential Impact/Hazard	Inherent Risk (C=Consequence; L=Likelihood; RS=Risk Score)			Management/Mitigation Measures	Residual Risk (C=Consequence; L=Likelihood; RR=Residual Risk)		
			C	L	RS		C	L	RR
Surface and Groundwater	Storage & handling of hazardous materials (e.g. hydrocarbons)	Spill or leak to environment with potential to contaminate downstream surface and/or groundwaters.	4	C	18	Appropriate storage and handling of hazardous materials and monitoring of storage facilities, in accordance with Australian Standards. Refer to EMP	3	B	9
Air Quality & Noise/ Vibration	Operation of vehicles, plant and equipment (e.g. generators, drill rigs)	Degradation in air quality, including generation of excessive dust.	2	C	8	Maintenance of equipment to minimise air emissions as far as possible. Avoid activities generating excessive dust and if required, implement dust mitigation measures (e.g. watering). Refer to EMP	2	B	5
		Disturbance to fauna and/or people associated with excessive noise and vibration.	2	C	8	Avoid operating in areas known or suspected to contain habitat/signs of significant fauna species. Maintenance of equipment to minimise air emissions as far as possible. Refer to EMP	2	B	5
Ground Disturbance	Clearing of native vegetation and vehicle access	Loss of key plant species/habitats and/or direct mortality of terrestrial vunerable species.	3	B	9	Personnel trained in identification of all threatened species (Flora and Fauna) listed in the EPBC Protected Matter Search Report. Avoidance of areas known or suspected to contain habitat/signs of all threatened species species (Flora and Fauna) listed in the EPBC Protected Matter Search Report. Cross country temporary access tracks without clearing to be used. Avoid clearing mature trees >2m in height.	3	A	6

Subject	Aspect	Potential Impact/Hazard	Inherent Risk (C=Consequence; L=Likelihood; RS=Risk Score)			Management/Mitigation Measures	Residual Risk (C=Consequence; L=Likelihood; RR=Residual Risk)		
			C	L	RS		C	L	RR
						Refer to EMP			
		Poorly managed site leading to incursion by weeds	3	C	13	Vehicles are to be washed down in Alice Springs prior to mobilising Communicate advice on weed identification and treatment Avoid areas of known weed infestation Refer to EMP	3	B	9
		Soil erosion & sedimentation	3	C	13	Cross country temporary access tracks used to minimise soil disturbance. Avoid areas with erodible soils. Refer to EMP	3	A	6
Management of Waste & Hazardous Goods	Disposal of putrescible and general waste	Poorly managed site encourages use by native/introduced fauna	3	B	9	To dissuade dingoes and other scavengers from entering camps, food scraps are to be burnt, standing water is to be avoided and feeding and encouragement of any animals is not permitted. Refer to EMP	2	B	5
		Contamination to land	2	B	5	All non-biodegradable to be relocated at an approved waste disposal site Certain waste materials (i.e. cardboard, food scraps) will be burnt on site. Refer to EMP	2	A	3

Subject	Aspect	Potential Impact/Hazard	Inherent Risk (C=Consequence; L=Likelihood; RS=Risk Score)			Management/Mitigation Measures	Residual Risk (C=Consequence; L=Likelihood; RR=Residual Risk)		
			C	L	RS		C	L	RR
Fire	Lighting of fires (accidental/intentional)	Direct mortality of native vegetation and significant terrestrial fauna species. Loss or impact to human health and/or infrastructure	4	C	18	Personnel are banned from lighting fires except under controlled conditions in a designated campfire. Most tracks provide two routes to allow for evacuation. Refer to EMP	2	C	8
Rehabilitation	Rehabilitation activities	Poorly designed and constructed rehab. Can lead to erosion and sedimentation and weed establishment	3	B	9	Annual monitoring and remedial works, if required Protection of open sumps to prevent access by animals/personnel. Refer to Section 5 Exploration Rehabilitation	2	B	5

5.4.2 Environmental management plans

5.4.2.1 Water Management

In 2017 potable water will be supplied from Alice Springs. Some drinking water may be purchased at Kintore or Papunya. Water bore RN19124 will be used for drilling water if required.

Water bore RN16936 along the Gary Junction Rd (547070E, 7434860N) will be utilised as a back-up supply for camp water. Permission to access this bore was received from Glen Auricht, Roads Planning Manager-Civil, Department of Infrastructure, Planning and Logistics in 2016 and has been requested for 2017. This will only be used if permission is obtained.

In 2016 water consumption was 1000L per week for a 4 man ground geophysics team and 2500L per week in camp during the drilling programs.

The drilling undertaken in May-June consumed 18,000L of water that had accumulated in the sumps after a rain event in May. In addition to this 20,000L of water was extracted from water bore RN19124. (9,500L/week)

The drilling undertaken in October/November consumed 30,000L (2500L/week for camp and 2500L/week dust suppression)

Weekly water use projections for 2017 water consumption is;

1. Ground geophysics or soil sampling: 1000 L per week. For a 4 man mobile camp which includes kitchen, showers and clothes washing.
2. RC drilling: 5000 L per week. (2500L for camp, 2500L for drilling and dust suppression)
3. Diamond drilling. 15,000L per week.

Water use will be monitored and recorded to provide an accurate level of water consumption. This will in turn act as a study for potential future exploration operations and give an accurate idea of logistics required in this remote region.

Table 9: Water management

WATER MANAGEMENT	
OBJECTIVES	To maximise the efficient use of water on site.
TARGETS	All potable water requirements met by utilising water from existing infrastructure in Alice Springs and/or Mount Liebig. Drilling water will be met from RNo19124, with a contingency plan utilisng roadside bore RN 16936.
ACTIONS	Appropriate storage and handling of water to minimise waste. Appropriate cleaning methods to minimise potential risk of introducing chemicals into local water sources.
MONITORING	Daily monitoring and recording of all water, to and from the supply source.
REVIEW & REPORTING	Review of project data at the end of the field season. Reporting of monitoring data in annual update of MMP. Report any significant issues as an incident to DPIR, in accordance with Section 29 of the Mining Management Act.

5.4.2.2 Air quality and noise management

Given the remote location, short period of operation and scale of the proposed activities, the risk of impacts associated with air quality and noise/vibration are considered to be very low.

Table 10: Air quality and noise management

AIR QUALITY & NOISE MANAGEMENT	
OBJECTIVES	Minimise air and noise emissions as far as possible.
TARGETS	No complaints from staff, contractors or the public.
ACTIONS	Rehabilitation as soon as possible to stabilise any areas exposed or disturbed to minimise dust generation. Whenever possible, avoid conducting dust generating activities during high wind speed conditions (drilling to use dust suppression). Undertake regular maintenance of all machinery and vehicles. Limit vehicle, plant and machinery speeds to reduce dust.
MONITORING	Complaints received will be recorded and attended to promptly. On receiving a complaint, works will be reviewed to determine whether issues relating to the complaint could be avoided or minimised. Feedback will be provided to the complainant explaining what outcomes resulted. Records in Environmental Observations and Incident Register.
REVIEW & REPORTING	Report any significant issues as an incident to DPIR, in accordance with Section 29 of the Mining Management Act. Review of any observations/incidents in annual MMP reporting.

5.4.2.3 Ground disturbance management

The proposed 2016/17 exploration program is intended to be undertaken with the intention of minimising the need to clear vegetation. Cross country access tracks and Quad bikes will be utilised for the sampling and ground geophysics programs. Once drill positions have been identified the CLC and DPIR will be informed.

The use of a mid-sized multi-purpose drill rig is expected to allow the drilling program to take place in this environment with only minimal access clearing required. Temporary cross country access tracks will be used for the initial drilling with an upgraded track to be created only if positive results are received from the next phase of drilling. Field access would ideally be limited to dry periods in order to avoid vehicles getting bogged or causing wheel rutting. Sumps will be excavated at the drill locations if ground water is encountered to prevent the spread of the groundwater and drill cuttings off the pads.

Table 11: Ground disturbance management

GROUND DISTURBANCE MANAGEMENT	
OBJECTIVES	To minimise disturbance to vegetation and soil as far as possible. To avoid disturbance to key vegetation communities that may impact on significant fauna species.
TARGETS	No disturbance to key vegetation communities. No disturbance of areas with higher risk of soil erosion. Avoid damage to mature trees exceeding two metres, as required under Aboriginal Land Access agreements.
ACTIONS	Utilise existing roads, tracks or open cross country routes to gain access into a tenement or prospect area. Minimise clearing of tracks and ensure that vehicle movements are restricted to cleared access tracks and nominated tracks. Avoid tracks crossing sand dunes. Utilise 'cross-country' tracks as much as possible (i.e. no clearing). Avoid field activities during wet conditions to minimise risk of vehicle/equipment bogging.
MONITORING	Regular inspections of work sites, tracks and camp areas, including photo monitoring. Records in Environmental Observations and Incident Register.
REVIEW & REPORTING	Report any significant disturbance to key vegetation communities as an incident to DPIR, in accordance with Section 29 of the Mining Management Act. Review of monitoring data and summary of disturbance activities in annual MMP reporting.

5.4.2.4 Fauna Management

Table 12: Fauna management

FAUNA MANAGEMENT	
OBJECTIVES	To minimise disturbance and potential impact on fauna as far as possible. To avoid introduction of non-native fauna species.
TARGETS	No impact on native fauna (i.e. injuries or death), especially species of conservation significance. No introductions of non-native fauna species.
ACTIONS	Food scraps are to be burnt or regularly removed, standing water is to be avoided and feeding and any other interaction with fauna is not permitted. Field personnel are prohibited from killing or attempting to handle snakes and any other fauna. Field personnel are not permitted to bring any domesticated animals to the Project Area and are prohibited from interacting or interfering with any wild fauna. Personnel trained in identification of all threatened species (Flora and Fauna) listed in the EPBC Protected Matter Search Report. Avoidance of areas known or suspected to contain habitat/signs of threatened species (Flora and Fauna) listed in the EPBC Protected Matter Search Report. Keep vehicle speeds to a minimum and avoid driving during periods of peak fauna activity (e.g. sunrise/sunset, night-time). Vehicles and equipment entering the Project Area from interstate will be washed down in Alice Springs to lower the probability of transporting small species of introduced animals (e.g. rodents, ants). If coming from another mine site in NT they may be washed down at this site.
MONITORING	Regular inspections of work sites, tracks and camp areas. GPS coordinates and photographs of suspected evidence of significant fauna, such as scats, tracks, scratchings or burrows, are to be recorded by field personnel. Records in Environmental Observations and Incident Register.
REVIEW & REPORTING	Report any significant fauna deaths (i.e. species of conservation significance) as an incident to DPIR, in accordance with requirements of Section 29 of the Mining Management Act. Report any high density populations of feral animals to government authorities. Review of data and summary of fauna injuries/deaths in annual MMP reporting.

5.4.2.5 Weed management

Information from the Weed Management section of the Department of Environment and Natural Resources (DENR) website and NRMaps indicates that the declared Class B weed, Mossman River Grass- Cenchrus echinatus is likely to be present in the Lake Mackay Project area. This is an annual grass with prostate or erect stems forming loose tufts up to 60cm high. An image of Cenchrus echinatus can be seen in Figure 2.

Table 13: Weed management

WEED MANAGEMENT	
OBJECTIVES	To prevent spread of established weeds within Project Area and the region.
TARGETS	No increase in the distribution of existing weed species. No introduction of new weed species.
ACTIONS	Field personnel are to wash down vehicles and equipment prior to entering the project area. This will be done in Alice Springs prior to coming out to the project site or at the mine site location within the NT that they are coming from.
MONITORING	Monitoring inspections of work sites, tracks and camp areas is to include recording and control of weed infestations that appear to be associated with exploration e.g. weeds not present in the “before” photographs, and weeds not previously seen/recorded from the area/region.
REVIEW & REPORTING	The Site Manager is to record weed conditions and control outcomes during inspections/monitoring. Any significant infestations of Class A weeds to be reported to DENR. Review of data and summary of weed management activities in annual MMP reporting.

Figure 2: Image of Cenchrus echinatus (Mossman River Grass)

5.4.2.6 Non-mineral waste management

Table 14: Non-mineral waste management

NON-MINERAL WASTE MANAGEMENT	
OBJECTIVES	To avoid and minimise the production of waste wherever possible. To prevent wastes from contaminating the surrounding environment. To manage and control disposal of all wastes.
TARGETS	No contamination of surrounding environment.
ACTIONS	Employ principles of avoid, reduce, reuse and recycle wherever possible. All non-biodegradable waste (e.g. plastic, steel, aluminium) is removed from site to be relocated at an approved waste disposal site and recycled wherever possible. Certain waste materials (i.e. cardboard, food scraps) will be burnt on site to reduce the risk of attracting fauna. Waste that may cause contamination (e.g. waste oils) is to be stored appropriately (see Hazardous Materials Management) and removed from site for disposal at a suitable facility in Alice Springs. Waste water from the shower and washing machine will be discharged in a manner so that no standing water is present.
MONITORING	Regular inspections/audits by the Site Manager of camp and operational areas to ensure that waste is being managed appropriately.
REVIEW & REPORTING	Include summary of inspections/audits and waste management activities (including recycling) in annual MMP update.

5.4.2.7 Hazardous materials management

Apart from hydrocarbons (i.e. fuel and oils), there will be minimal or no storage of hazardous materials in the Project Area.

For ground geophysics and sampling storage is limited to:

- Diesel Fuel: 3 x 200 litre drums and 1 x 800L Truck Mounted Fuel Cell
- OPEL ULP: 2 x 200 litre drum
- vehicle and genset oils and coolants

During drilling operations larger volumes of fuel (greater than 1000L) is required. This will be stored on site in an approved fuel transportable self-bunded containers.

Table 15: Hazardous materials management

HAZARDOUS MATERIALS MANAGEMENT	
OBJECTIVES	To ensure that transport, storage and handling of dangerous goods on-site does not cause environmental harm or harm to persons. To minimise potential for land contamination.
TARGETS	No harm to environment or persons resulting from transport, storage and handling of dangerous goods.
ACTIONS	Field personnel will respond to an emergency as described in Section 4.7. Hydrocarbons will be stored in appropriately bunded areas according to Australian standards (e.g. AS1940:2004). Bunding will be inspected for damage regularly and repaired as soon as any damage is detected. Hazardous substances will be stored on site in accordance with the relevant legislative requirements and guidelines. Key personnel will be trained in the appropriate handling of the various chemicals to be stored on site. A set of the relevant MSDS for hazardous and dangerous materials will be kept on site. Personnel working with dangerous goods will be aware of handling, storage and disposal requirements and as appropriate, have received relevant training. Spill kits will be available where hazardous materials are used and stored and personnel trained in correct use. Refuelling on site shall utilise auto shut off valves and refuelling shall not be done within 100 metres of a watercourse.
MONITORING	Storage facilities will be inspected regularly (at least weekly) and any resulting recommendations and corrective actions shall be implemented. Records in Environmental Observations and Incident Register.
REVIEW & REPORTING	Reporting of any incidents internally and to DPIR in accordance with Section 29 of the Mining Management Act. Summary of inspections to be provided in annual MMP reporting.

5.4.2.8 Fire management

Project personnel are strictly banned from lighting fires except under controlled conditions. Fires are banned during the course of normal field work activities but camp fires and barbecues are permitted in designated areas under controlled conditions.

Occasional wild fires are encountered in the Lake Mackay region, often during the months July through to November when vegetation from the previous wet season has dried out, and lightning from storm activity in the warmer months and fires lit by Traditional Owners (often for hunting purposes) get out of control. These fires can burn vast areas over several days -weeks.

Table 16: Fire management

FIRE MANAGEMENT	
OBJECTIVES	Minimise the risk of impact of fires associated with exploration activities.
TARGETS	No wildfires caused by exploration activities, whether deliberate or accidental.
ACTIONS	The following guidelines are to be followed by all field personnel: • Open fires must be dug into the ground and/or surrounded by a low earthen or rock wall to prevent spreading of hot embers and burning wood; • Open fires must be sited on cleared ground which is barren of vegetation over a radius of at least five metres from the fireplace; • Fires should only be used as needed for cooking; • Fires are not to be lit under windy conditions; • A shovel and/or ready supply of water must be close at hand; and • Only dead wood should be collected for fuel and fire wood should be checked for inhabitants prior to use, e.g. lizards within hollow logs. To minimise risk of vehicle fire, all vehicles must carry fire extinguishers and/or 'on-board' fire suppressant systems. If a wild fire is encountered or is accidentally caused this should be reported to Bushfires NT and seek advice on advising the nearest emergency services provider. Personnel should avoid the area and evacuate any downwind positions. For safety reasons, IGO personnel or contractors are not permitted to try to fight such fires as they can be highly unpredictable.
MONITORING	Regular inspections of firefighting equipment to ensure that it is serviceable. Regular checks of undercarriage of light vehicles and ATV's and cleaning, to ensure build-up of grass is limited, thus minimising the risk of vehicle fires and trailing spot fires. Records in Environmental Observations and Incident Register.
REVIEW & REPORTING	Reporting of any incidents internally and to DPIR in accordance with Section 29 of the Mining Management Act. Review of inspections/checks to be provided in annual MMP reporting.

5.5 Environmental audits, inspections and monitoring

Due to the low impact nature of the exploration that is undertaken at this stage of the project the environmental auditing is very limited. Active work on the project generally occurs in 2-4 week phases.

At the completion of drilling the drill pads are inspected to ensure that no spills are observed or rubbish is present. Drill collars are temporarily capped until the full rehabilitation is undertaken.

If camp sites are established for longer periods a monthly audit is undertaken. At the completion of each phase of work all rubbish is removed from the camp sites and any contaminated soil is removed for disposal at the licensed facility in Alice Springs.

Photographs are taken of the camp sites prior to establishment and the drill sites prior to clearing. Once rehabilitation is completed the sites are photographed again.

Environmental impacts will be continuously assessed through frequent site inspections by the Site and Environment Manager, ensuring that IGO's expectations are being met by all employees and contractors. Should a site inspection determine that additional control measures are required, they will be put in place in a timely and effective manner.

5.6 Environmental performance

5.6.1 Objectives and targets

IGO will ensure that its environmental performance is monitored by keeping up to date records of environmental risk assessments, inspections and incidents as they occur.

All employees and contractors involved in exploration activities will be made aware of their environmental responsibilities and obligations with respect to accurate record keeping.

Upon completion of exploration activities, a timeline for rehabilitation will be established to ensure that the impact of exploration activities is minimised.

IGO will endeavor to ensure that any impact created upon the environment by exploration activities is always minimized.

To the best of its ability, IGO will also ensure that any disturbed area is rehabilitated to a point where the land:

- Is safe and stable;
- Is restored as near as possible to its pre-disturbed condition; and,
- Has its environmental values safeguarded to ensure a sustainable ecosystem.

In addition, identified stakeholders will be encouraged to attend frequent site inspections and have their say as to whether or not they are satisfied with IGO's rehabilitation procedures and outcomes.

5.6.2 Performance Reporting

The ground geophysics conducted in March 2016 consumed 800L of water that came from Alice Springs.

The diamond drilling undertaken in May-June consumed 38,000L of water that was extracted from water bore RN19124 and water that had filled the sumps after the rain event in May prior to drilling. (9,500L/week)The camp for the drilling consumed approximately 10,000L (2500L/week). This water was obtained from RN 16936 along the Gary Junction Rd.

The ground geophysics conducted in August-September consumed 1000L per week for a 4 man crew.

The reverse circulation drilling in October-November consumed 2500L per week for dust suppression and 2500L per week for camp for 7 people.

No complaints of any kind were received from any stakeholders during the 2016 exploration activities.

Clearing of mulga scrub was required near the Bumblebee Prospect to allow the final 1km of access track to be straightened; minimal clearing was also required at the drill pads, although the collar positions were modified to reduce the amount of clearing that was required. The 5 sumps that were excavated for the diamond drilling were all rehabilitated.

Two dingoes were seen during the drilling program at Bumblebee, kangaroo tracks were also common in the area.

Camel tracks were seen along the access tracks.

No weeds were identified in the project area.

Fires were used at the camp sites for cooking and burning of food waste and cardboard. No fire incidents were recorded in the past year.

No environmental incidents have occurred on the project since the ATV fire in 2013.

5.7 Emergency procedures and incident reporting

IGO employees and contractors are required to record all environmental incidents in a site register. Operators are now required to record and report all environmental incidents regardless of its severity classification in accordance with Section 29 of the Mining Management Act.

The Standard Operating Procedure for Hazardous Spills Clean Up and Disposal is provided in Appendix 6.

6 Exploration rehabilitation

The rehabilitation methods are outlined in Table 17.

Table 17: Rehabilitation summary and schedule

Disturbance	Rehabilitation Activities	Schedule (Timing)	Closure Objectives / Targets	Monitoring Techniques
Drill holes	Collars capped, rubbish removed	Upon completion of drilling or down hole surveying.	Prevent fauna falling down hole.	Site inspection
Drill pads	Drill spoil buried	Once results are available and additional assaying has been completed. (following field season)	Natural re-vegetation of areas, no erosion.	Site inspection and photographic record.
Sumps	Sumps filled in	As above	Natural re-vegetation of area, no subsidence.	Site inspection and photographic record.
Costeans	N/A			
Bulk sample pits	N/A			
Tracks / Gridlines	Temporary access tracks left to revegetate, ripped if erosion is a concern.	Upon completion of drill program and target downgraded.	Natural re-vegetation of areas, no erosion.	Site inspection and photographic record.
Sample bags	Sample bags removed	Once results are available and additional assaying has been completed. (following field season)	No sample bags left on site	Site inspection and photographic record.
Camp	All camp equipment and vehicles removed.	Upon completion of program.	Natural re-vegetation of areas, no erosion.	Site inspection and photographic record.

All of the rehabilitation activities tabled above will be carried out in accordance with Northern Territory DPIR Advisory Notes # AA7-005 and # AA7-029

6.1 Exploration rehabilitation register

Table 18: Exploration rehabilitation register

Exploration Activities Rehabilitation Summary (Cumulative)											
Reporting period	**Tenement**	**MMP Reference**	**Drill Holes /Pads (No.)**	**Rehab'd Drill Holes/ Pads (No.)**	**Drill Line/ Access Track Length (km)**	**Rehab'd drill line/access track (km)**	**Camp (ha)**	**Camp Rehab'd (ha)**	**Costeans /Bulk Samples (No.)**	**Costeans /Bulk Samples rehab'd (No.)**	**Comments**
Aug 2014-Aug 2015	EL9343, EL9442, EL9449, EL10305, EL10306, EL24299, EL24492, EL24567, EL24858, EL24915, EL24949, EL25630, EL25632, EL25866, EL27780, EL27872, EL27906, EL28028, EL29459, EL29460, EL29483	0815-01	239	0	467.6	366.9	0	0	0	0	
Aug 2015-Aug 2016	EL9343, EL9442, EL9449, EL10305, EL10306, EL24299, EL24492, EL24567, EL24858, EL24915, EL24949, EL25630, EL25632, EL25866, EL27780, EL27872, EL27906, EL28028, EL29459, EL29460, EL29483	0815-01	12 (251) Two pads cleared with sumps that were not used	150	20.1 (487.7)	366.9	0	0	0	0	The rehab was approved for the 366.9km of temporary cross country tracks and 150 drillhole (ref M2014/0025). Only EL24915 remains to be rehabbed. This data will be recorded in subsequent MMP's.
Aug 2016-Feb 2017	EL24915	0815-01	18 (119)	24 (24) Includes rehab of 2 pads with sumps that were not used	5.8 (126.6)	17.4	0	0	0	0	

7 Bibliography

Scrimgeour IR, 2013. Chapter 12: Aileron Province in Ahmad M and Munson TJ (compilers). '*Geology and mineral resources of the Northern Territory*'. *Northern Territory Geological Survey, Special Publication 5.*

Suite 4, Level 5
85 South Perth Esplanade
South Perth WA 6151

PO Box 496
South Perth 6951
Western Australia

T. +61 8 9238 8300
F. +61 8 9238 8399
E. contact@igo.com.au

igo.com.au
Independence Group NL
ABN 46 092 786 304