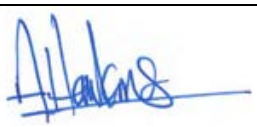
MINING MANAGEMENT PLAN

Operator:	Newmont Tanami Pty Ltd
Project Name:	Officer Hill
Authorisation Number:	0894-01
Reporting Year:	2019
Date:	30 November 2018

I Radislav Golijanin, Newmont Tanami Operations General Manager, 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: 30 November 2018

	Author	**Reviewed by**	**Approved by**
Date	23/11/2018	26/11/2018	30/11/2018
Signature			
Name	Alan Hawkins	Greg Sale	Radislav Golijanin
Position	Principal Exploration Geologist	Land Manager	General Manager

Contents

List of Tables

List of Figures

List of Appendices

Amendments

Section	Amendment
Section 1	*Key Contact Person/s list updated*
Section 1.1	*Updated organisational structure*
Section 1.2	*Updated Workforce details.*
Section 3.3	*2018 Completed Work Program updated.*
Section 3.4	*2019 Proposed Exploration Activities updated.*
Section 3.5	*Support and logistics aspects updated consistent with increased scope*
Section 4.1.1	*Climate data updated.*
Section 4.1.2	*Updated Topsoil and subsoil*
Section 4.1.4	*Updated Topography*
Section 4.1.9	*Updated protected matters search completed November 2018*
Section 6.2	*Rehabilitation status of 2017 works areas*
Section 6.3	*Rehabilitation status of 2018 works areas*
Section 6.4	*Security estimates updated*

1 OPERATORS DETAILS

Operator Name:

Newmont Tanami Pty Ltd
ACN 007 688 093
ABN 39 007 688 093

Key Contact Person/s:

Radislav Golijanin
General Manager
Tanami Operations Office
Telephone: (08) 8993 8229
E-mail: Rad.Golijanin@newmont.com

Craig Turley
External Relations Superintendent
Tanami Operations Office
Telephone: (08) 8993 8656
E-mail: Craig.Turley@newmont.com

Philippa Sivwright
Regional Exploration Manager
Welshpool Exploration Office
Telephone: (08) 9423 6175
Email: Philippa.Sivwright@newmont.com

Address:

Tanami Road, Tanami, Northern Territory
Phone Number (08) 8993 8200
Fax Number (08) 8993 8500
Postal Address P.O. Box 8020
Alice Springs NT 0871

1.1 Organisational Structure

Figure 1 – Regional and Global Exploration Team Organisation Structure

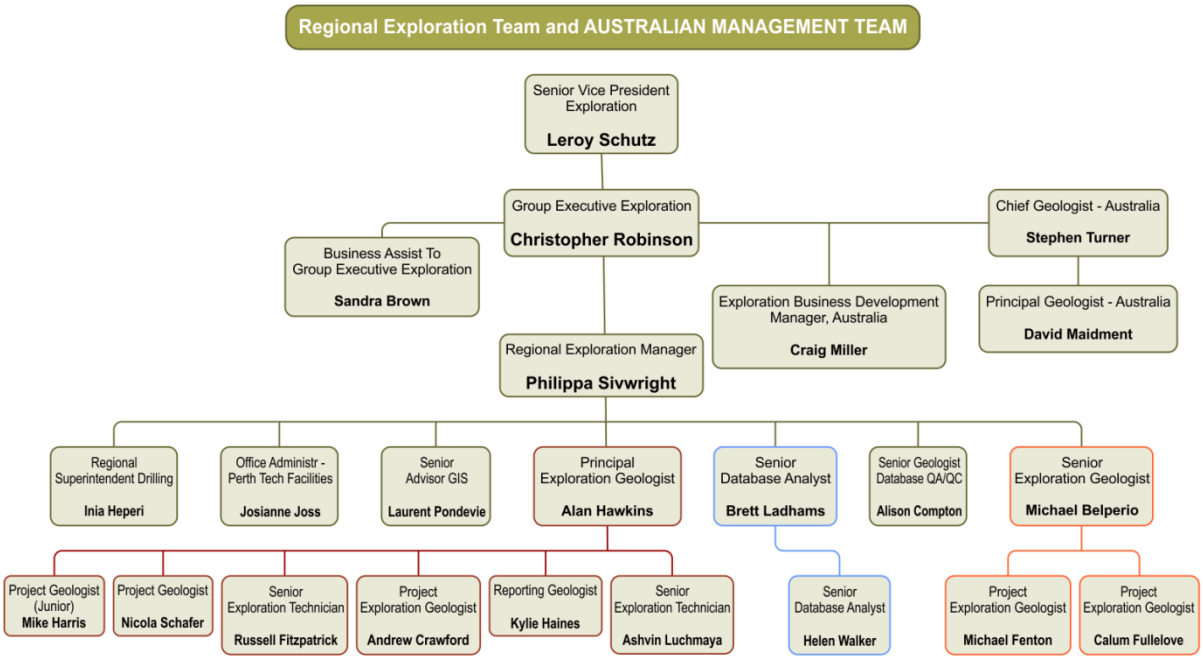


Figure 2 – Newmont Tanami Operations Management Organisation Structure

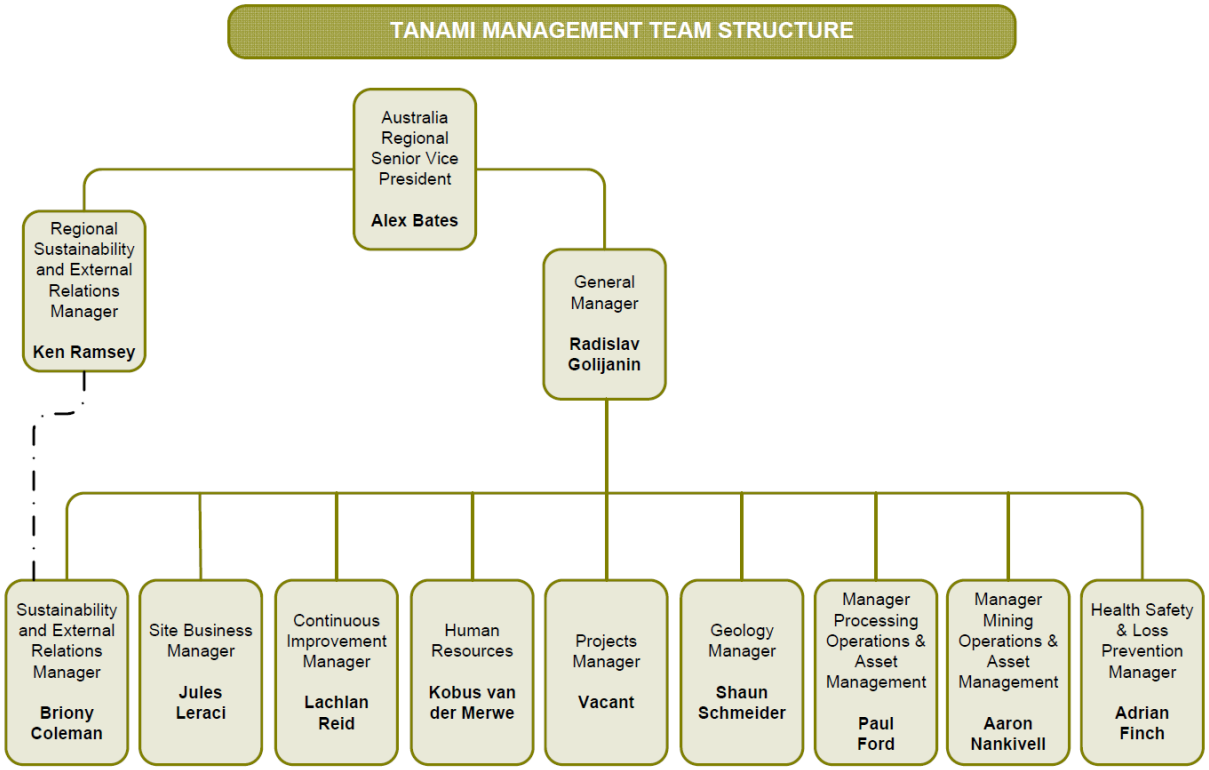
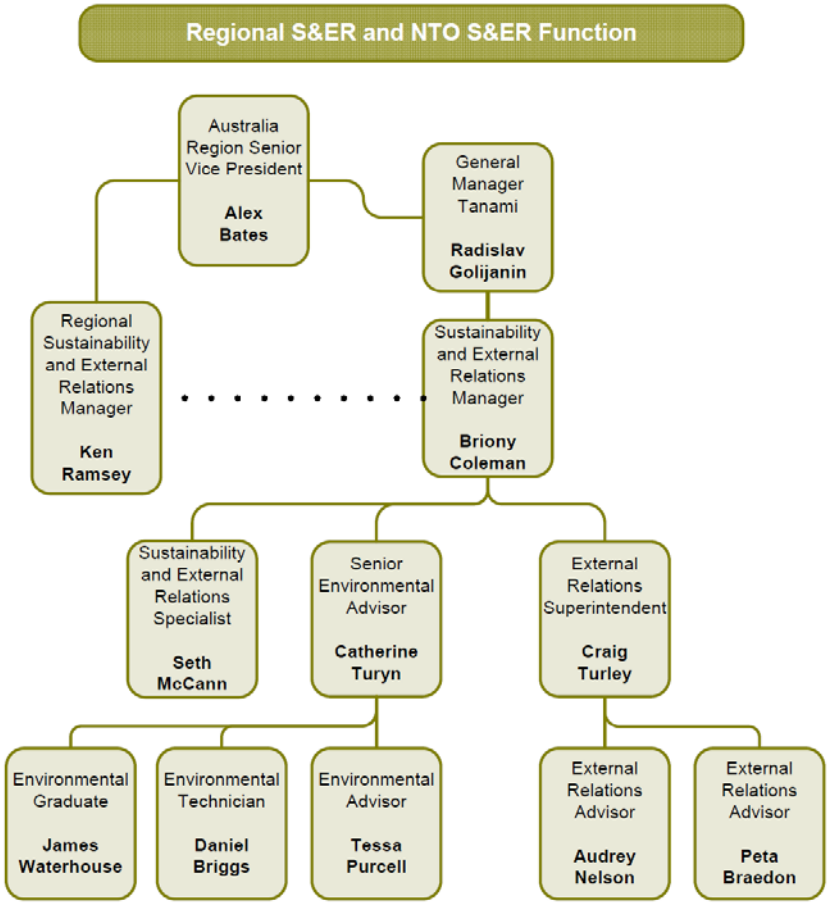


Figure 3 – Newmont Tanami Operations Sustainability & External Relations Organisation Structure



1.2 Workforce

Personnel conducting exploration activities at Officer Hill (EL 23150) will be from Newmont's Regional Generative Exploration (GENEX) team based out of the Newmont Technical Facility in Welshpool, Western Australia. The GENEX team consists of approximately six geoscientists and four geological field technicians assisted by a number of environmental and heritage professionals. The company may also engage contract drilling companies, geophysical companies, earthmoving and rehabilitation professionals and local indigenous entities to assist in completing the proposed work.

Exploration personnel will be based at Newmont Tanami Operations (NTO) whilst carrying out exploration activities at Officer Hill, however during such times where drilling activities are required to be carried out, personnel will camp in the vicinity of the drill rig on a short term campaign basis to minimise travel time between the Granites and Officer Hill.

Contractors to be used by the GENEX team include:

- Surface Exploration Drilling – DDH1 Drilling;
- Geophysical Surveying – CGG;
- Earthmoving & Rehabilitation – NTO Surface Works Department and Mark Savage from Tanami Downs Station.

NTO's support service functions, inclusive of the Geology; Health, Safety and Security (HS&S); and Sustainability & External Relations (S&ER) Departments will also assist with the execution of the works.

2 IDENTIFIED STAKEHOLDERS

Every five years, NTO conducts extensive research on the impact of our operations through Social Impact Assessments (SIA). These assessments include collecting insights and feedback from residents and other stakeholders about NTO and the future needs of the community across the mine's extended life.

NTO's SIA was conducted in 2009, 2013 and most recently completed in 2018 by Centre for Social Responsibility in Mining Pty Ltd (CSRM). The primary focus of the 2018 SIA was to provide information on understanding and quantifying priority areas, impacts on some of the more qualitative social components such as community cohesion and environmental values of the traditional owners of the Granites / Dead Bullock Soak (DBS) and the aboriginal residents of Yuendumu, Lajamanu, Willowra and Nyirripi. The report from the consultants are yet to be received, however findings from the 2018 SIA will be developed into an action plan for delivery in 2019.

2.1 Stakeholders

NTO has set a clear strategic direction for stakeholder engagement that achieves appropriate, regular and consistent engagement with key stakeholders on the performance, achievements and the future of the Tanami operations. The key stakeholders for the NTO include:

- Traditional Owners of the Warlpiri language and cultural group;
- Central Land Council (CLC);
- NT Department of Primary Industry and Resources (DPIR);
- NT Department of Environment and Natural Resources (DENR);
- NT WorkSafe;
- Newmont Tanami Pty Ltd (NTO) and Newmont Australia;
- Newmont Mining Corporation (NMC) shareholders;
- Workforce and contractors;
- Owners of Rabbit Flat;
- Pastoralists;
- Local Indigenous communities in the Tanami Region; and
- Community of Alice Springs.

NTO has developed a Stakeholder Relationship Management Plan to set a clear strategic direction for stakeholder engagement that achieves appropriate, regular and consistent engagement with key stakeholders on the performance, achievements and future of NTO. The objectives of the NTO Stakeholder Relationship Management Plan are to:

- Maintain stakeholder support for NTO's exploration and mining programs;
- Retain stakeholder confidence in NTO's commitment to continuing performance in the Tanami life of mine (LOM) operations and fulfilling our legacy obligations; and
- Provide effective participation between the business and key stakeholders on commitments, obligations and expectations.

As part of the annual NTO Business Planning process, the Sustainability and External Relations Manager formally reviews the site's Stakeholder Mapping, Stakeholder Database and plans for proactive engagement with stakeholders. The NTO Stakeholder Database outlines details of planned engagements with key stakeholders and provides a guide for measuring actual vs. planned stakeholder engagement.

2.2 Community Affairs

The Tanami Operation lies within the Central Desert Shire, comprising of nine communities, the nearest of which, are:

- Yarturlu Yarturlu Outstation (intermittently occupied) – Traditional owner residence located approximately 700m south-east of the eastern boundary of the Granites mineral lease;
- Rabbit Flat – 55km north-west of the Granites mineral lease, along the Tanami Highway. The owners continue to reside at the residence and operate the meteorological station;
- Tanami Downs pastoral operation on the Mangkururrpa Aboriginal Land Trust - located approximately 70km to the west of the Granites mineral lease;
- Supplejack pastoral lease homestead – located approximately 75km to the northwest of the Granites mineral lease; and
- Yuendumu and Lajamanu Aboriginal Communities – located 270km south-east and 370km north of the Granites mineral lease, respectively.

NTO recognises that the local communities in which we operate have an interest in our project activities in the region as do numerous government, non-government and non-profit organisations in the Northern Territory. Through the External Relations Department, NTO engage with our stakeholders on their concerns, aspirations and values regarding expansion, operational and closure aspects. This is fundamental to the way we build relationships that will enable all parties to benefit from our mining activities.

2.3 Land Access

The Officer Hill Exploration Licence is located on Aboriginal Freehold Land which was granted as inalienable freehold title to the Central Desert Aboriginal Land Trust in 1980, pursuant to the *Aboriginal Land Rights (NT) Act* 1976.

The Traditional Owners for the region are from the Warlpiri language group. The land is managed on behalf of the Warlpiri by the Central Desert Aboriginal Land Trust, administered by the CLC. Much of the land in the region is of high ceremonial and cultural value to the Traditional Owners.

Approval for land access as a precursor to conducting exploration activities proposed in the Mine Management Plan (MMP) is administered by the CLC through the Deed for Exploration and conditions specific to the Exploration Licence. Annual submissions are made to the CLC for approval of access and execution of proposed activities, concurrent to the submission of the MMP to DPIR.

3 PROJECT DETAILS

Project Name:	Officer Hill.
Tenement(s):	EL 23150 – details in Table 1, illustrated on Figure 4 and Figure 6.
Holder(s):	Nova Minerals Ltd (formerly Quantum Resources Ltd) (100%). Newmont has acquired a beneficial interest of 70% which has not yet been registered.
Registered Operator:	Newmont Tanami Pty Ltd.
Land Council Representing Traditional Owners:	Central Land Council.
Site Access:	Newmont Tanami Operations, approximately 546km NW of Alice Springs along the Tanami Track.

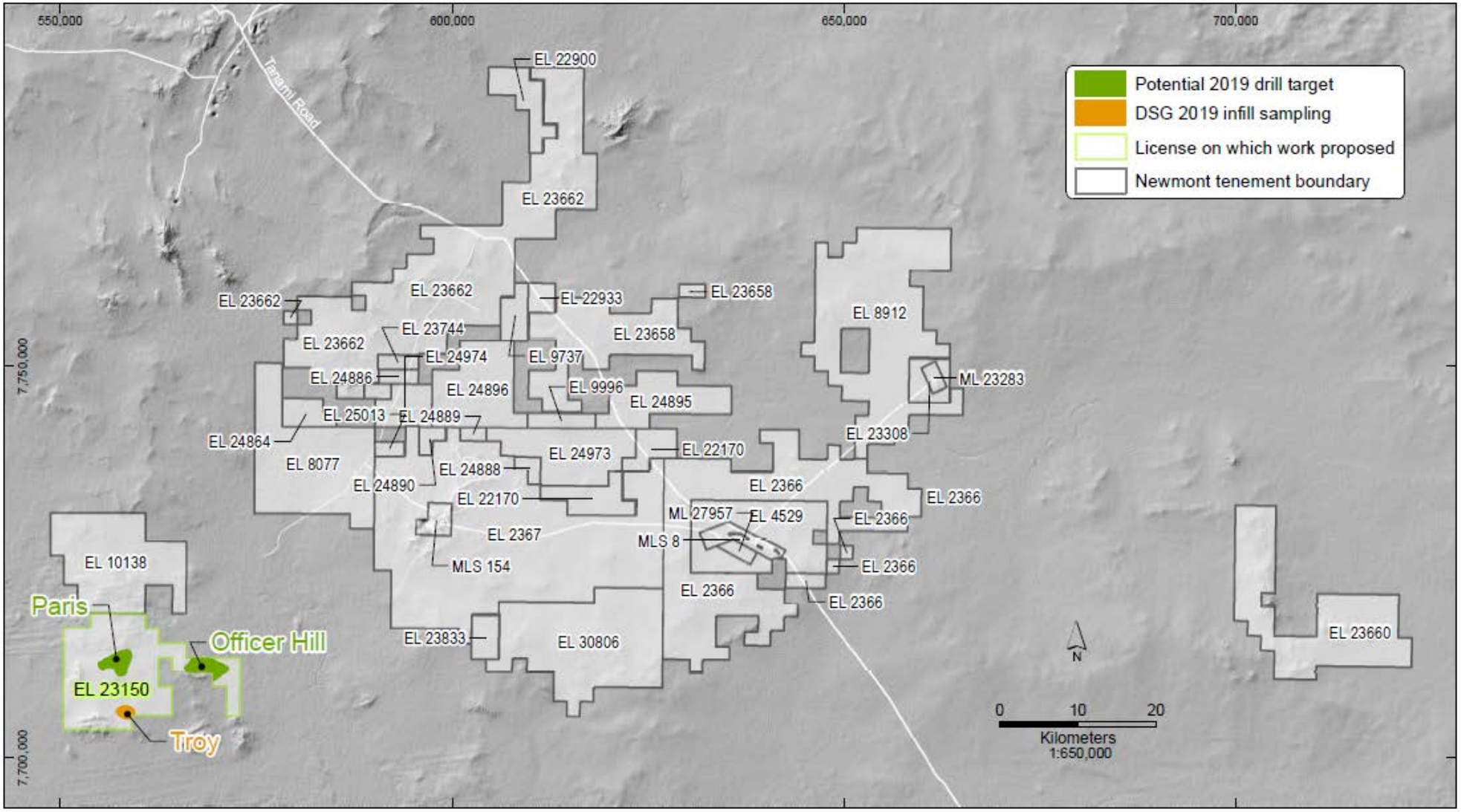
Table 1 - Tenements covered under Authorisation 0894-01

Lease	Lease Name	Grant Date	Expiry Date	Area	Holders
EL 23150	Officer Hill	29-Jul-13	28-Jul-19	64 blocks	Nova Minerals Ltd (formerly Quantum Resources Ltd) (100%)

3.1 Site Location & Layout

The location and access for exploration activities proposed for the 2019 calendar year are shown on Figure 4 and Figure 6.

Figure 4 – NTO Exploration and Operational Tenements with 2019 Officer Hill Prospects



3.2 History of Development

3.2.1 General

The principal types of work to be conducted on EL23150 include:

- Cultural heritage clearance by the CLC;
- Low impact reconnaissance exploration, including the clearance of light vehicle tracks and the employment of various surface sampling techniques (e.g. BLEG, soil, lag, rock chip);
- Rotary Air Blast (RAB)/Air Core (AC) drilling of holes <100m deep, typically employing shovel clearance of ~4m x 4m pads and no sumps;
- Reverse circulation (RC) drilling and collection of subsurface material for geochemical analysis. Holes generally less than 200m deep with clearing of drill pads of dimensions up to 40m x 40m, excavation of a small pit (estimated maximum dimensions of 3m x 3m x 2m) to provide material for construction of earthen safety bunding adjacent to drilling rig and establishment of access tracks;
- Diamond drilling and collection of subsurface material for geochemical analysis. Holes generally greater than 100m deep with clearing of drill pads of dimensions up to 40m x 40m, excavation of between one and four sumps (3m x 3m x 2m) to collect and recirculate drilling fluids and establishment of access tracks;
- Progressive rehabilitation of all disturbances in accordance with requirements of Deeds for Exploration with the Central Land Council (CLC) and industry guidelines with the immediate capping of all holes, re-distribution of stockpiled topsoil, scarifying of compacted areas, monitoring of the progress of rehabilitation and weed management; and
- Auditing of rehabilitation.

Cultural heritage clearances by the CLC were carried out during the 2017 work program prior to commencing works. Refer to section 3.5.9 for cultural heritage clearance carried out before the 2018 campaign.

The exploration history for the Officer Hills project area is detailed in the 2018 Mining Management Plan and the reader is referred to that document for further information.

[redacted]

[redacted]

[redacted]						
[redacted]						
[redacted]						
[redacted]						
[redacted]						

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]		
[redacted]		
[redacted]		
[redacted]		
[redacted]		
[redacted]		
[redacted]		
[redacted]		
[redacted]		
[redacted]		
[redacted]		
[redacted]		
[redacted]		
[redacted]		
[redacted]		
[redacted]		

[redacted]

[redacted]

[redacted]

[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]

[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]

[redacted]

[redacted]

3.5 Exploration Works Support & Logistics

3.5.1 Work Crew & Plant

The work program proposed will involve up to three geologists and six field assistants, and a drill crew of up to ten staff working on a rotational basis. The number of people likely to be working in the area at any one time will vary from a minimum of four to a maximum of ten.

The main plant to be used in the 2019 Work Program is anticipated to consist of:

- Four light vehicles – transport;
- A side-by-side Polaris Utility Task Vehicle (UTV) – DSG sampling;
- Up to four quad bikes – DSG sampling and gravity station collection;
- Drilling rig – multi-purpose RC/diamond (DDH1 Drilling);
- Support vehicles (compressor truck, rod truck, water truck etc);
- A grader – for clearing tracks; and
- A backhoe – for digging sumps.

3.5.2 Access Roads & Tracks

The 2017 Exploration Works Program saw the re-opening historic and establishment of new vehicle access tracks to the prospects. A total of 3.18km of historical access tracks were re-opened and the establishment of a further 16.4km of new access tracks (7.8ha actual vs 14.4ha, proposed). Tracks established during the 2017 program were retained and utilised during the 2018 program with allowance made for establishing further access via establishment of historical tracks and minor new tracks for local drill rig access of 1.5km and 5km respectively.

Creation of any new tracks in 2019 will be in line with that carried out in 2017 and 2018 with a nominal track width of 4m to allow easy access by the light vehicles, drilling rigs and associated support vehicles. All vehicle tracks established for operations during the proposed exploration program will be rehabilitated in line with the commitments of the appropriate Deed for Exploration and in line with the respective requirements detailed in the *Mining Management Act (NT)*.

The tracks will be rehabilitated once confirmed to no longer be required for successive exploration programs; with the exception of existing or historic tracks providing access to

specific locations or features; unless otherwise advised by CLC. As the 2017 DSG sampling program generated positive results for the Officer Hills area, it is intended that the tracks be kept open to service subsequent exploration programs.

3.5.3 Drill Pads & Camp Pads

All drill pads and any required camp pads to be cleared have been accounted for in Table 4, at a nominal area of 40m x 40m. It is Newmont's Duty of Care to provide a safe working environment for its employees and contractors. These dimensions have historically proven to be most appropriate to accommodate the drill rig and support vehicles, as well as equipment, consumables and water sumps, which enables the drill crew to perform their duties in a safe environment.

The area has also been shown to act as a sufficient fire break to protect the drilling equipment in the event of a bush fire, after the drill personnel have vacated the area. Any topsoil disturbed will be stockpiled adjacent to the pad for use during rehabilitation. All drill pads and camp pads established for operations during the proposed exploration program will be rehabilitated in line with the commitments of the appropriate Deeds for Exploration, when it is deemed that no further exploration activities will be carried out in the particular area.

3.5.4 Exploration Camp

The establishment of any form of exploration camp will be carried out in line with the guidelines of Newmont's 'Australia Generative Exploration Procedures Manual – Sustainability and External Relations'. For the majority of the 2019 exploration program, all personnel will be accommodated at the existing Granites Camp (Authorisation 0086-02) whenever possible. To minimise the risk of daily long-distance travel, to manage fatigue, and to optimise time spent in the field, a small remote camp was used for field activities conducted at the Officer Hill prospect on EL 23150 by the drill crew in 2018.

The mobile camp accommodated six to eight people at a time. The location of the camp was located immediately adjacent to one of the access tracks in a central location close to the drill program where minimal clearance of vegetation was required. Land clearance for the camp has been accounted for in Table 4, and was exactly the same as for the drill pads, with the camp occupying a 40m x 40m footprint. In general, the camp incorporated:

- Tents / caravans for accommodation and messing;
- A small portable camp toilet;
- A small potable water storage unit; and
- A small generator to run a fridge, lights and allow the charging of electronic equipment.

All potable water consumed by the camp will be sourced from the reverse osmosis facility at the DBS mine and transported to site. General waste materials produced by the camp will be disposed in either 'Burn' or 'Non-Burn' bins as per the current NTO Waste Management Plan requirements. All waste was and will continue to be appropriately segregated and removed to the appropriate waste disposal facility at DBS. Hazardous materials management and storage, including hydrocarbons, will continue as per the NTO Hazardous Materials Management Plan.

3.5.5 Water Use

Raw water to service drilling operations will be sourced from standpipes on MLS 154, at NTO's DBS operations. The raw water will be carted by a water truck to the drill sites, where it will be transferred directly into sumps that will be dug at each drill site. All water use will be

in compliance with the guidelines of Newmont's 'Australia Generative Exploration Procedures Manual – Sustainability and External Relations' Water Management Standard.

Discussions are continuing between the CLC and NTO with regard to accessing water from bores around Tanami Downs Homestead for use during the Officer Hill drilling. During 2018 water was being carted from DBS. As exploration targets become progressively further away from the mine infrastructure, carting water becomes impractical and also presents a number of environmental and safety concerns, particularly:

- Degradation of access tracks from multiple runs of the water truck;
- Soil erosion and excess dust caused by 'bull dust';
- Increased risk of vehicles getting bogged;
- Increased driving exposure and fatigue; and
- The potential to have to drive in non-daylight hours.

The potential for drilling a water source bore at each (remote) project area will be investigated and discussed with the CLC & DPIR.

3.5.6 Hydrocarbon Storage

The safe and environmentally responsible management of hydrocarbon and chemical products that may be used during generative exploration activities is guided by the Newmont Hazardous Materials Management Standard. This Standard sets the minimum requirements for the management of hazardous materials. Specifically, all hydrocarbon management will be undertaken as per the NTO Hazardous Materials Management Plan, which is consistent with AS1940 for storage and handling of flammable and combustible liquids. This management plan also details the process and requirements for containment, reporting and remediation of spills, which in summary includes:

- Spills between one and twenty litres shall be recorded on the minor spill log sheet;
- Spills in excess of twenty litres shall be reported in Cintellate and will undergo an investigation; and
- Any hydrocarbon contaminated material will be excavated and transported to the DBS contaminated soils bioremediation facility for remediation.

In relation to the camp on EL 23150, it is anticipated that up to 550L (2 x 205 litre drums and a selection of jerry cans) of petrol will be stored in appropriate bunding at the camp location to service the operation of quad bikes and the Polaris side-by-side UTV.

During all drilling activities a small volume (i.e., up to 100L) of lubricant and oil consumables will be stored in appropriate secondary containment at the drill rig for daily usage.

In summary, the camp on EL23150 will have adequate secondary containment provisions for 650L of hydrocarbon products.

3.5.7 Waste

The Newmont Waste Management Standard sets the minimum requirements for the management of hazardous and non-hazardous wastes and wastewater. Additional guidance is provided in Newmont's 'Australia Generative Exploration Procedures Manual – Sustainability and External Relations' describing how solid waste that is generated during Newmont Australia's generative exploration activities should be handled and managed.

Specifically, all waste generated in association with the exploration project will be collected and transported back to the DBS operational facilities to be disposed of in accordance with the NTO Waste Management Plan. General waste products will be segregated into either 'Burn' or Non-Burn" bins as per the current site standards. Any hydrocarbon contaminated

wastes will be segregated from other wastes, transported back to DBS operations and disposed of at the DBS turbo burner facilities. No waste is planned to be buried or disposed of within the exploration tenements.

3.5.8 Environmental Protection

All exploration activities will be conducted in accordance with standards outlined in Newmont's 'Australia Generative Exploration Procedures Manual – Sustainability and External Relations', to ensure that environmental disturbance is minimised and rehabilitated in an appropriate manner.

Disturbance will be minimised wherever possible and topsoil and grubbed vegetation will be retained for replacement during rehabilitation. Exploration activities will be conducted with particular attention paid to the minimisation of unnecessary disturbance to tree species of cultural significance or flora and fauna of high ecological value, as well as other large trees in the projects area.

3.5.9 Protection of Sacred Sites

The exploration activities will be conducted in a manner that ensures protection of scared and culturally significant sites. Newmont will ensure (through training at inductions and regular meetings) that all employees and contractors understand the importance of avoiding and protecting sacred sites and will ensure that the locations are kept confidential.

A cultural check was carried out on 28th April 2018 between NTO S&ER and Regional Exploration with TO's from Lajamanu, to establish the exact location of a grave site in the vicinity of the Officer Hill work area on EL 23150. The check had the approval from the CLC who helped coordinate the visit. The grave site was located, with a request that it has a small fence established around it. A GPS point was taken at the site which was also forwarded to the CLC. The fence was subsequently erected by members of NTO's Yapa Crew in May and a small exclusion zone was established around it.

4 CURRENT PROJECT SITE CONDITIONS

Mining activity (as defined in the Northern Territory Mining Management Act) means any of the following activities:

a) exploration for minerals;
b) mining of minerals;
c) processing of minerals, tailings, spoil heaps or waste dumps;
d) decommissioning or rehabilitation of a mining site;
e) operations and works in connection with the activities in paragraphs (a), (b), (c) and (d), including:
    i. the removal, handling, transport and storage of minerals, substances, contaminants and waste; and
    ii. the construction, operation, maintenance and removal of plant and buildings;
ea) operations and works in connection with exploration or mining generally;
eb) the construction, maintenance and use of infrastructure authorised by an access authority granted under the *Minerals Titles Act*;
f) operations for the care and maintenance of a mining site when an activity referred to in paragraph (a), (b), (c) or (d) is suspended.

Officer Hill Exploration Project activities are; exploration for minerals; and operations and works in connection with exploration generally.

4.1 Physical Environment

The Tanami Desert forms Region 78 of Australia's Biophysical Regions (Laut *et al.,* 1975) and extends from the eastern end of the Great Sandy Desert (W.A), east to the fringes of the Stuart Highway, Wave Hill in the north, east to beyond Mt Doreen and south to Lake Mackay.

In general, the Tanami Desert is a semi-arid tropical region recognised for its diverse array of arid ecosystems, rare species, intact habitats and minimal weed invasion. A biogeographical regionalisation of Australia (Thackway & Cresswell, 1995) identified the Tanami as Region 49, covering 292,194km^2. The region was described as:

> "mainly red Quaternary sandplains overlaying Permian and Proterozoic strata which are exposed locally as hills and ranges. The sand plains support mixed shrub steps of *Hakea subera*, desert bloodwoods, acacias and grevilleas over *Triodia pungens* hummock grasslands. Wattle scrub over *T. pungens* hummock grass communities occur on the ranges. Alluvial and lacustrine calcareous deposits occur throughout. In the north they are associated with Sturt Creek drainage, and support *Chrysopogen* and *Iseilema* short-grasslands often as savannahs with River Gum; in the south the saline alluvia of Lake Mackay support samphire low shrublands and *Melaleuca lasiandra* – *M. glomerata* shrublands."

4.1.1 Climate

The project area experiences a semi-arid and monsoonal climate, with approximately 90% of the annual rainfall occurring between November and April as illustrated in Figure 7. The nearest meteorological station, Rabbit Flat, receives an average rainfall of 482mm per annum, with extremes of 1,064.2mm in 2001 and 156.8mm in 1996 recorded by the Bureau of Meteorology website (Figure 8).

The magnitude of a rainfall event is typically assessed relative to the intensity and duration and is indicated as an Annual Exceedance Probability (AEP) of the event. The AEP represents the probability of a particular rainfall total being exceeded in any year. The AEP of a rainfall event can be determined by comparing the rainfall totals in the event against design

AEP rainfall totals for the site of interest. Rainfall depth for extreme rainfall events for the Granites site, based on the procedure outlined in Australiana Rainfall and Runoff (Nathan, R.J and Weinmann, P, 1998), is illustrated in Figure 9.

Evaporation averages 2,788 mm (Class A Pan) per annum. The hottest month at Rabbit Flat on average is January, with a mean daily maximum temperature of 38.4°C (Figure 10), while the coolest month is July with a mean daily minimum temperature of 6.9°C (Figure 11). The daily maximum exceeds 40°C on fifty-five days a year on average. Frosts rarely occur.

Prevailing winds are predominantly from the east and at 10km per hour and summer storms usually occur from the north-west. Daily wind rose data recorded at 9:00am for Rabbit Flat is presented in Figure 12.

Figure 7 – Mean Monthly Rainfall, Rabbit Flat BOM Station (015666) as reviewed on 13 October 2018

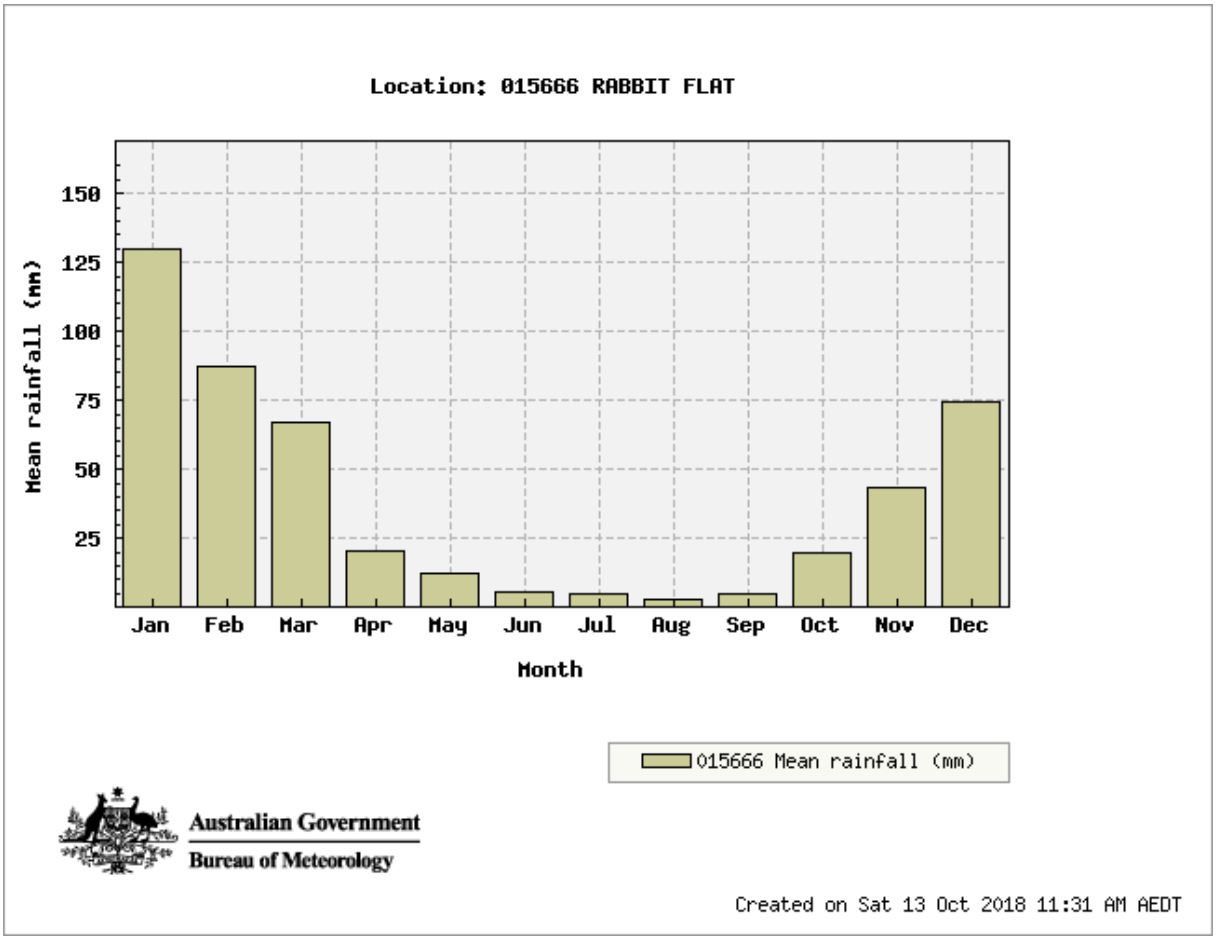
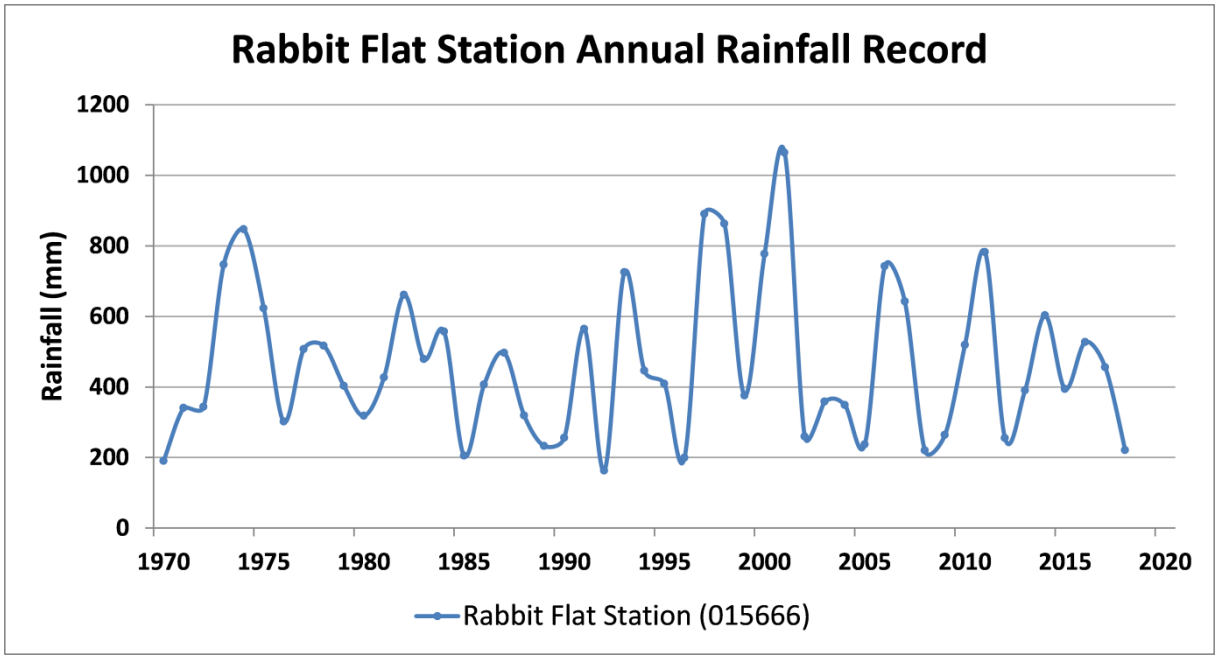


Figure 8 – Annual rainfall record for Rabbit Flat (BOM)



Note: Data sourced from BOM weather stations 015548 (1969 to 1998) and 015666 (1998 to 2018) www.bom.gov.au.

Figure 9 – Granites rainfall depth for extreme events

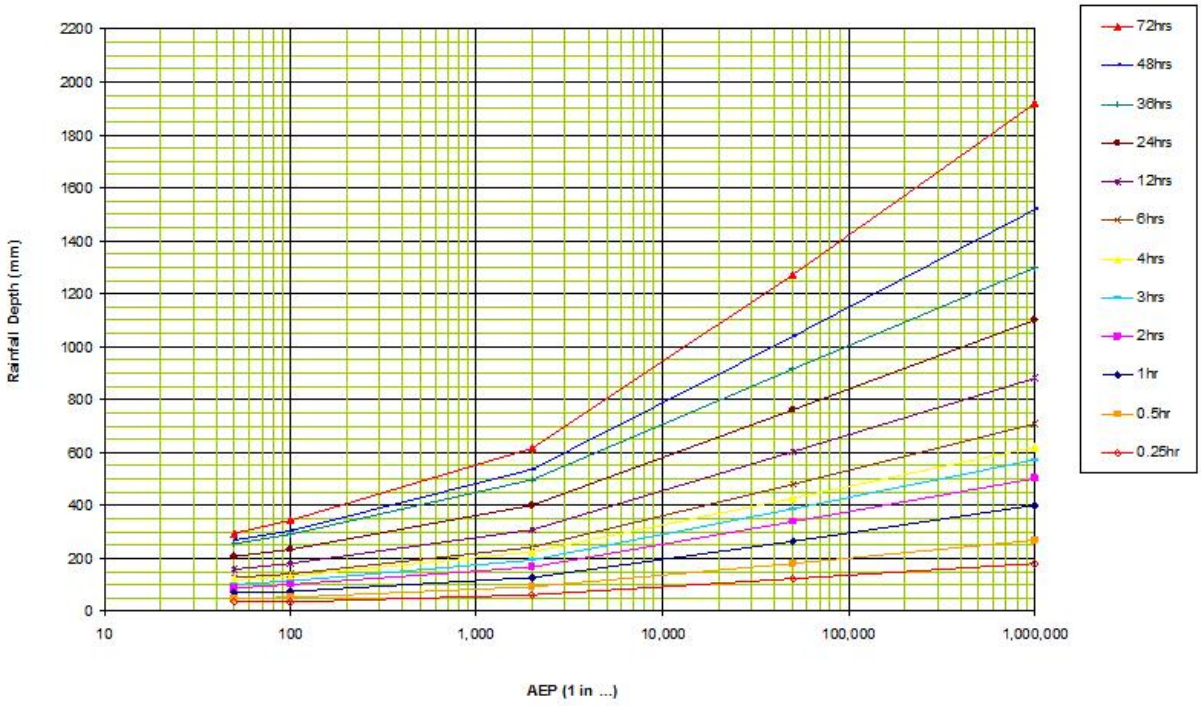


Figure 10 – Mean Monthly Maximum Temperature, Rabbit Flat BOM Station (015666)

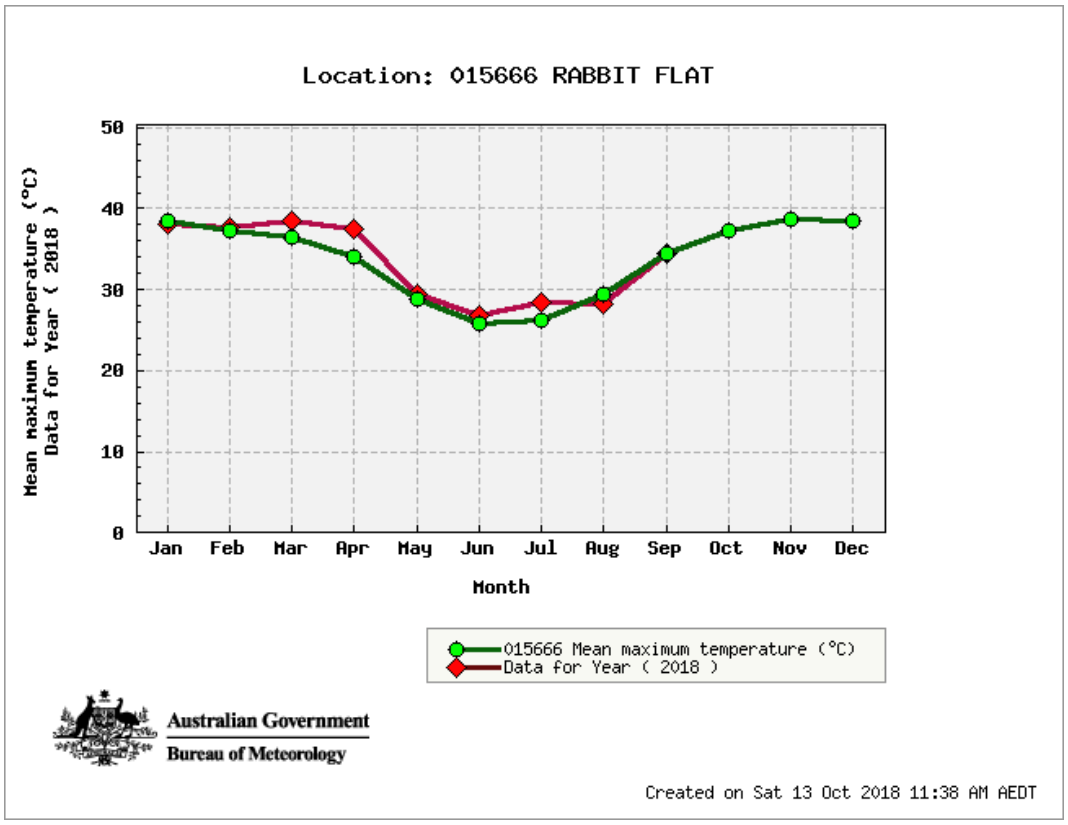


Figure 11 – Mean Monthly Minimum Temperature, Rabbit Flat BOM Station (015666)

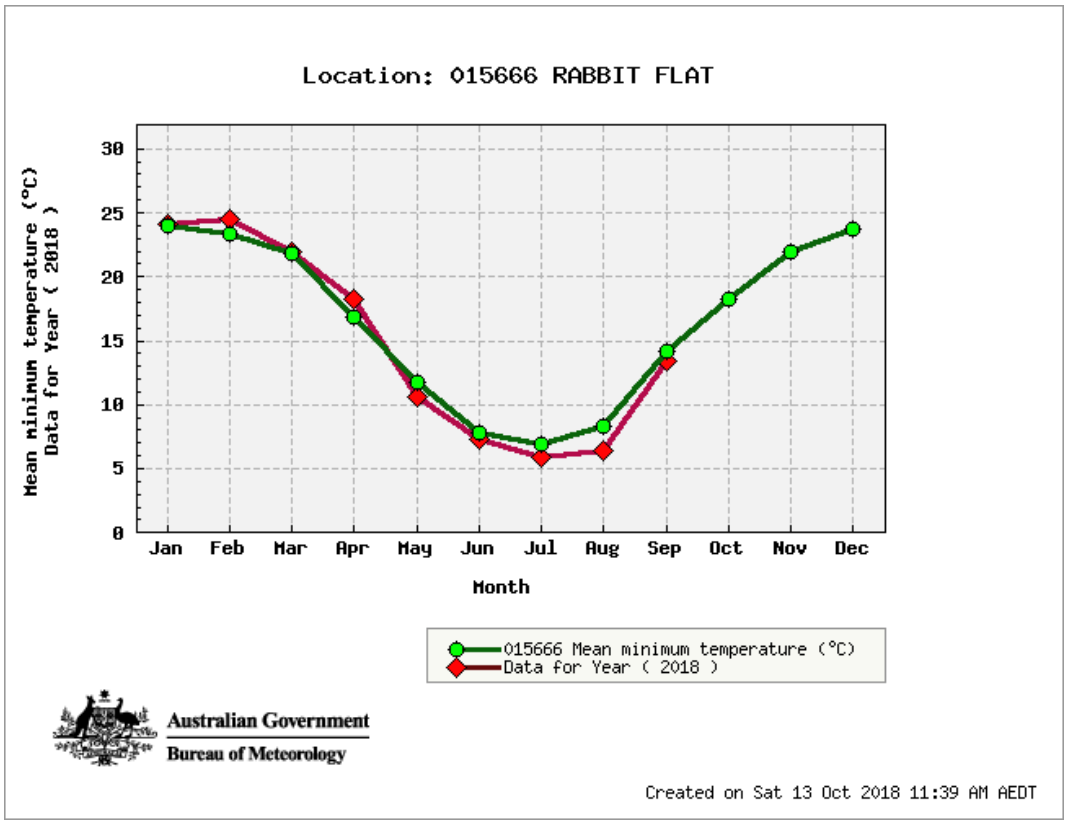
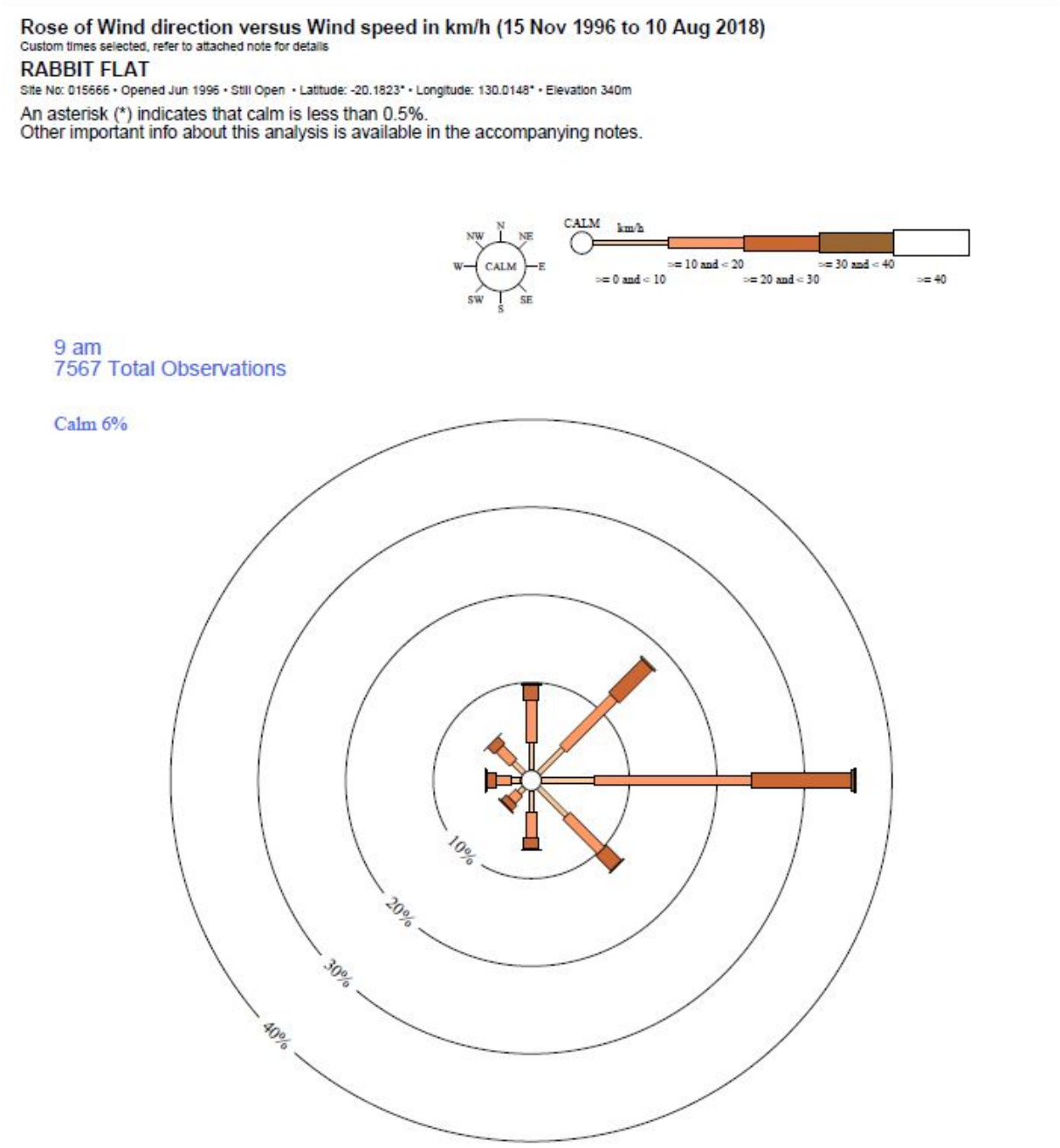


Figure 12 – Rabbit Flat wind rose, 9:00am daily wind direction Vs wind speed



Note: Data sourced from BOM weather stations 015666 (1996 to October 2018), 5033 observation.

4.1.2 Topsoil and Subsoil

Small-scale (1:5,000,000) soil maps have been prepared for the continent of Australia by Northcote (1975). Soils across the lease area are generally sandy loams to clayey sands over cemented, clayey sands. The complex of soils within the area are mostly overlain with siliceous sands and silts and with clayey sand to sandy loam texture, earthy fabric and ironstone gravel on the surface and in profile and red calcareous soils are present on areas of calcrete. Small areas of lateritic gravel occur in small rises and laterite with a mottled or pallid zone may occur under the sandy soils along the flanks of the palaeochannel.

The area south of the palaeochannel is more clayey sands of the palaeochannel. The palaeochannel soils tend towards silty sands with pedogenic calcrete nodules common.

Gypseous soils are common in perched depressions in the palaeochannel and the surface soils, particularly in the southern lake, are quite gypseous. The depth of soil varies between and within the Drainage Depressions; thin on the rock outcrops, to several metres deep in water holding depositional areas (*wirri*) and inter-ridge depressions and many metres deep overlying the ancient river bed forming the palaeochannel.

Drill hole samples show variable depths of sand and loam from a few hundred mm to 8m to 12m. Soils tend to be neutral to slightly acidic pH. The sandy loamy soils in the region can be erodible on exposed slopes though most areas have enough vegetation to prevent this from happening. The soils on the flat plains are prone to sheet erosion by wind and floods and saline areas can have a scalded appearance where vegetation growth occurs in the aeolian surface veneer of sand. As part of the 2017 DSG sampling program, observations on the type and nature of the soil and landforms of the area were collected to produce a Regolith Terrain Map (Figure 14) this will aid the interpretation of any anomalies generated by putting them into the context of their surroundings.

4.1.3 Regional Geology

The Tanami Orogen forms part of the Palaeoproterozoic North Australian Craton, and is neighboured by the contemporaneous Pine Creek and Halls Creek Orogens to the north and north-west, respectively. Huston *et al.,* (2007) provide an excellent summary of the regional and economic geology of the Tanami Orogen, which has been summarized in the 2018 Officer Hills MMP. The distribution of stratigraphic units and gold deposits is illustrated below in Figure 13.

4.1.4 Project Scale Geology

The Officer Hill project area is located on the Pedestal Hills (4756) and Inningara (4856) 1:100,000 geological map sheets. The project area is comprised of Quaternary sand dunes in the north with Cenozoic aged sand plains and ferruginous duricrust predominant across the remaining project area (Figure 15). Minor Proterozoic outcrop exists within the centre of the project area comprised variably of carbonaceous bedded siltstone and fine sandstone. An exposed ridge outcropping in the southern project area is comprised of the Muriel Range Sandstone consisting of chert units interlayered with carbonaceous siltstone and iron formation.

Historical mapping of outcrop and inferred lithological information interpreted an anticline within the area. Historical works have suggested that the ridge outcrops form part of the upper Dead Bullock Formation, which hosts economic gold mineralisation at DBS. The basement intersecting the project area is interpreted as consisting of biotite, hornblende granodiorite, with siltstone interbedded with metadolerite intrusive sills located predominantly in the east and northern project area. Sandstone and siltstone overlie the granodiorite, siltstone and metadolerite in the north-western project area (Figure 16).

The lithogeochemical assessment undertaken in 2016, found that the Officer Hill project is one of the few areas where the same prospective stratigraphy which hosts significant stratabound economic gold mineralisation at DBS is outcropping at surface or near surface.

Figure 13 – Distribution of stratigraphic units and gold deposits (Huston et al., 2007)

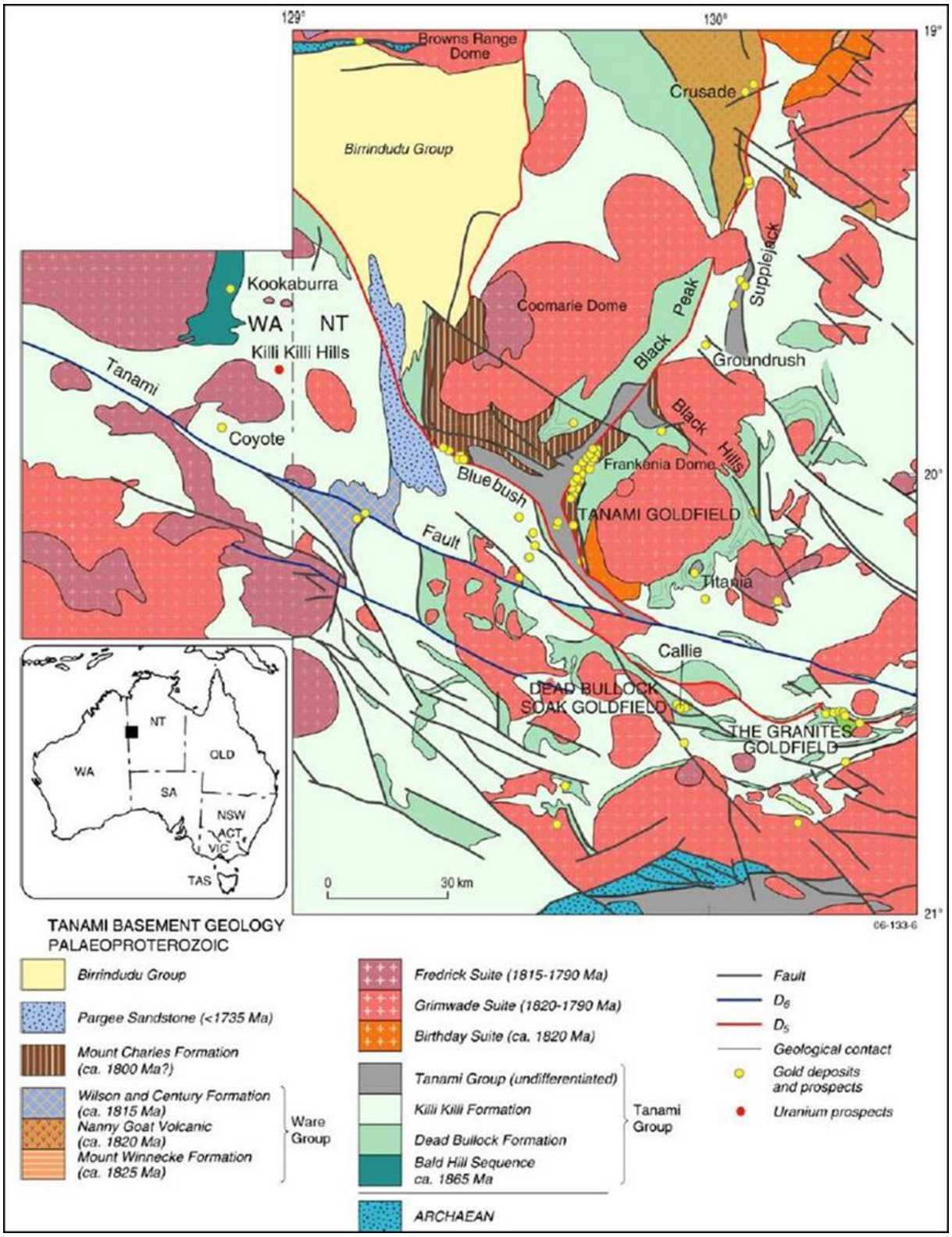


Figure 14 – Officer Hill Area Regolith Terrain Map

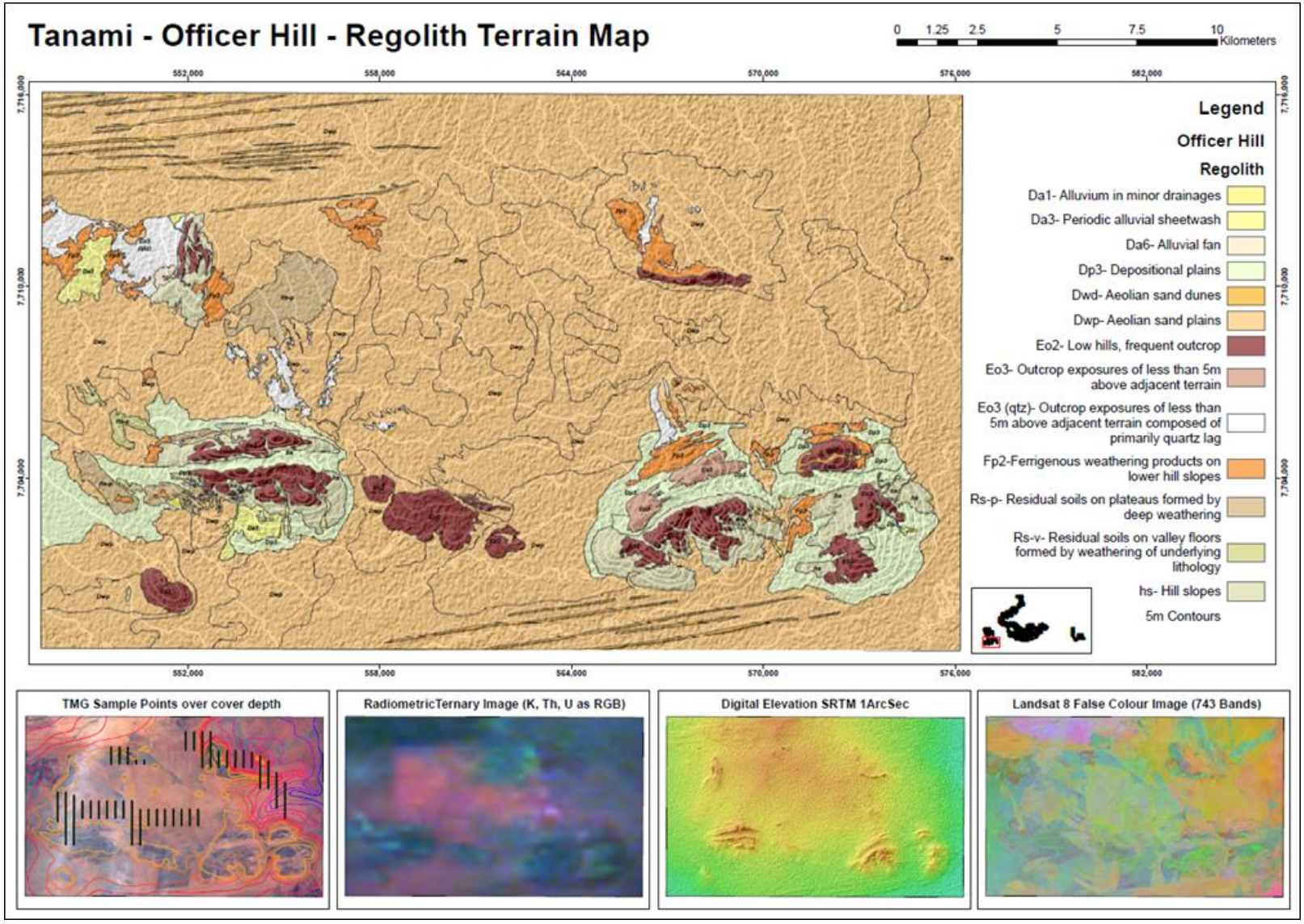


Figure 15 – Officer Hill (EL 23150) Surface Geology

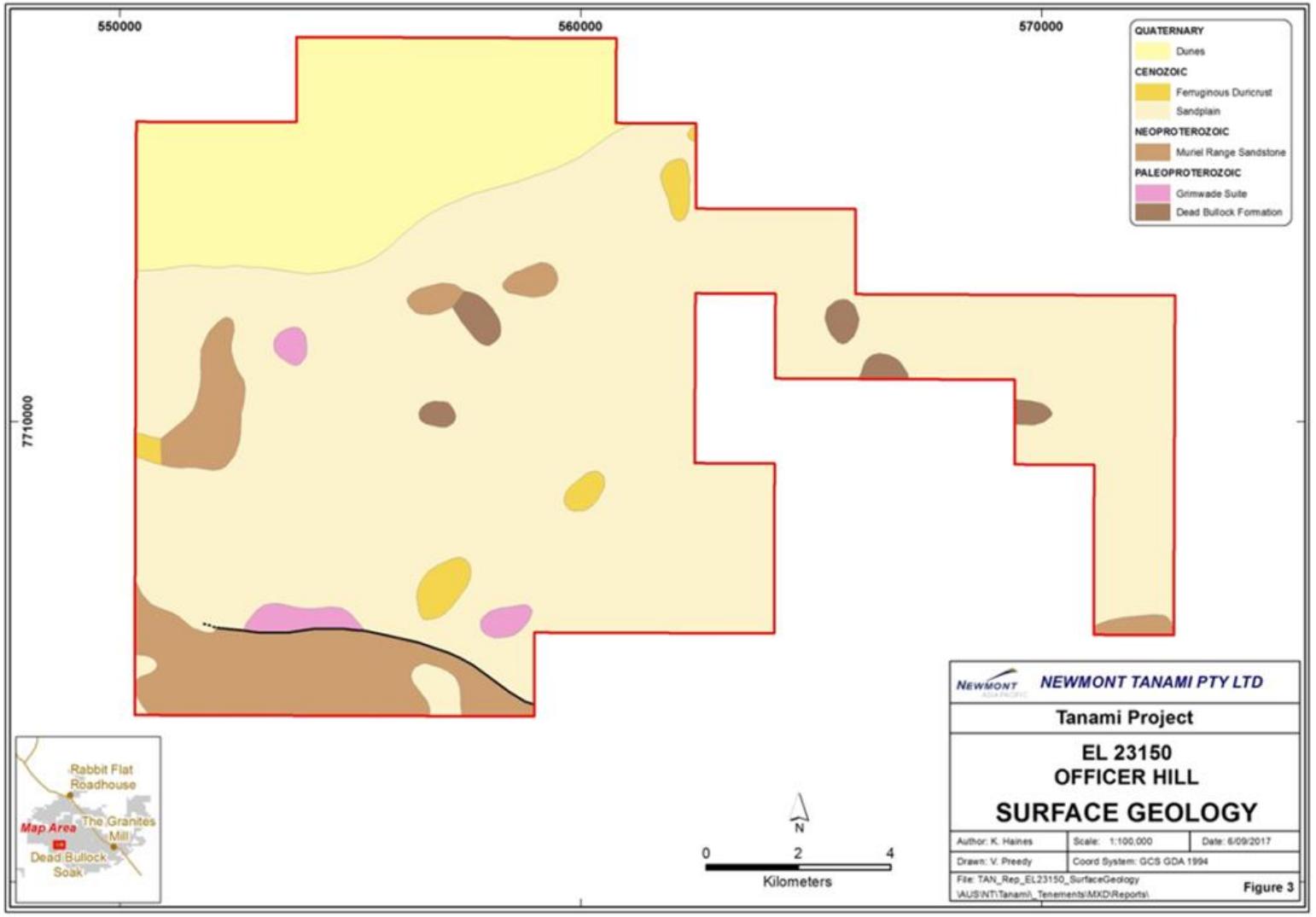
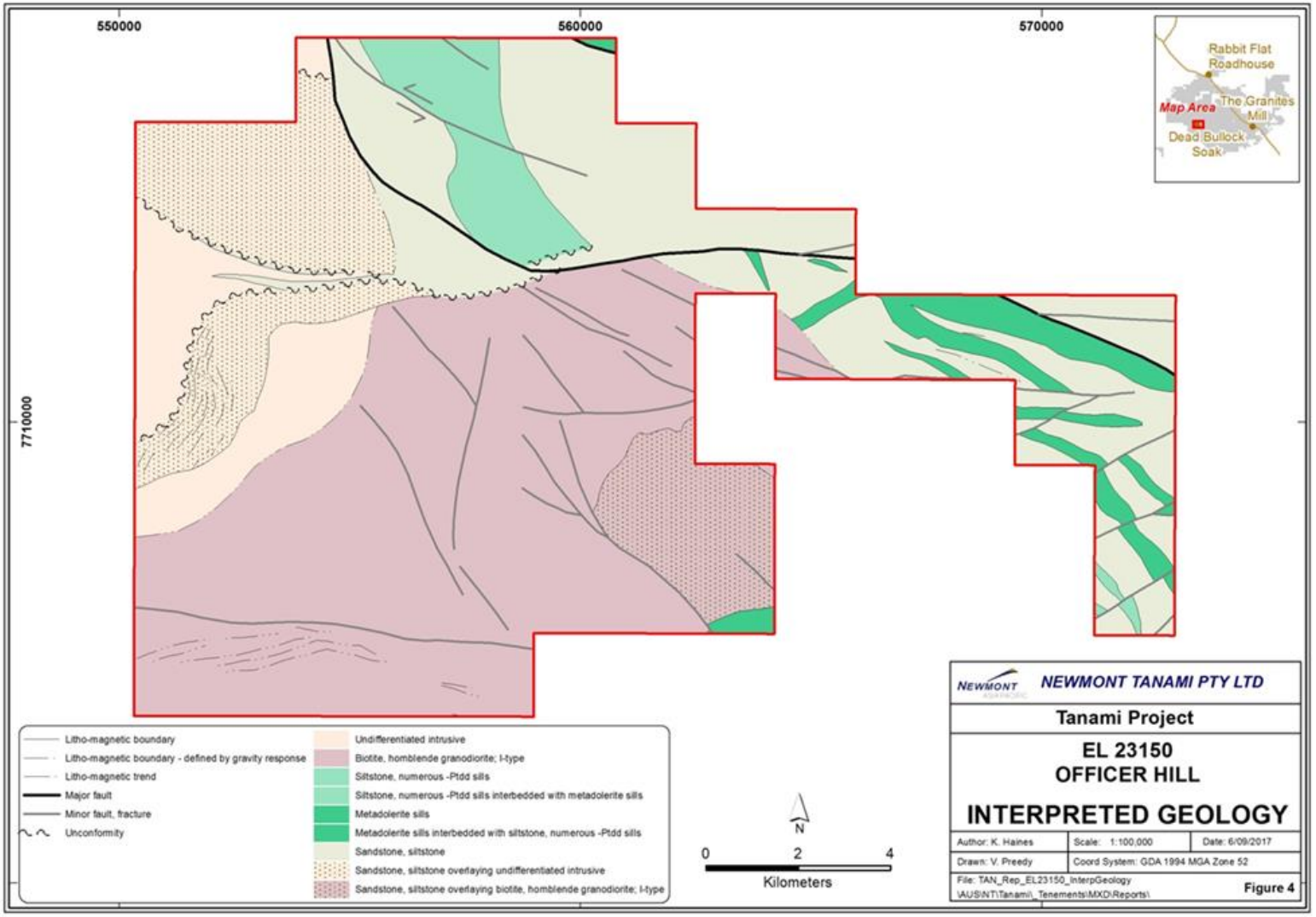


Figure 16 – Officer Hill (EL 23150) Interpreted Geology

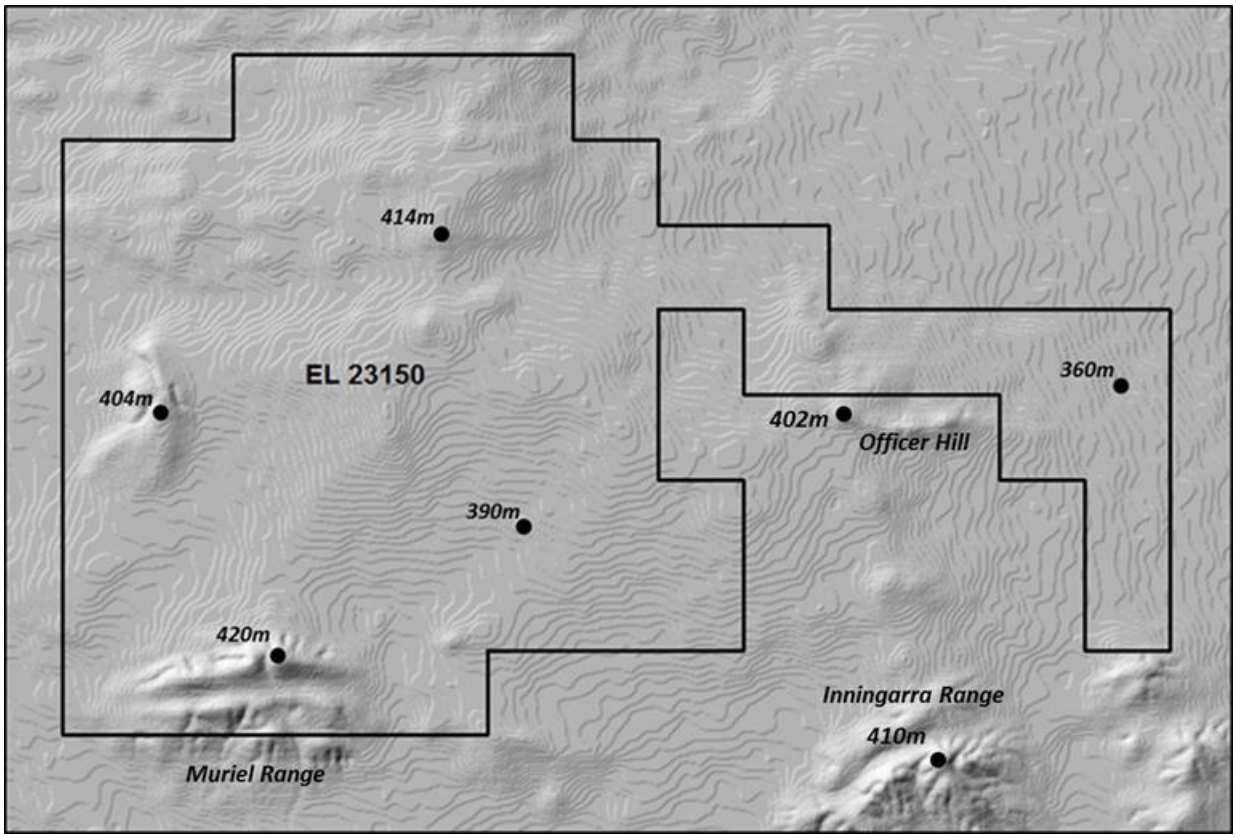


4.1.5 Topography

The geomorphology/land units of the Tanami area have been described by Domahidy (1990). The Tanami area is noted for the general low relief of the land units although small hills and ridges are locally significant remnants from the formerly flat Tertiary surface through which a major palaeochannel passes.

Locally, in the EL 23150 area, elevation ranges from a high of ~420m at Muriel Range in the southwest of the project area to ~390m - 400m in the central project area, decreasing to ~360m further towards the palaeochannels east of Officer Hill itself, which stands at an elevation of 402m (Figure 17). The Inningarra Range in the southeast of the project area, outside of EL23150, ranges from ~380m - 410m.

Figure 17 – Digital Elevation Map of the Officer Hill Area showing selected spot heights



4.1.6 Hydrology

The Tanami area has little permanent surface water with drainage generally undefined and water movement predominantly by sheet flow. No naturally occurring surface water bodies occur within or immediately adjacent to 2019 project area. As such, no abstraction or operational impacts to surface water aquatic ecosystems are possible.

4.1.7 Hydrogeology

Water supply for NTO is extracted from the Schist Hills Borefield and the Billabong Borefield located within or adjacent to the east-west trending palaeodrainage, approximately 17km west and 32km north-east of the Granites respectively. Within this palaeodrainage, ancient valleys which once formed a major westward flowing river system across the region, have been filled with sediment. Calcrete capping these valleys is porous and transmissive, forming

aquifers of significant capacity at shallow depth. The salinity of contained water ranges from 2,000mg/L to 38,000mg/L TDS.

Both aquifers hold significant volumes of water, and can be anticipated to be fully recharged following heavy rainfall. Deep aquifers (over 30m) exist across the prospect area and have a more complex recharge hydrology. Underground water flow is to the south in the palaeochannel, though there is a gentle surface slope to the north.

For further information refer to Authorisation Number 0086 MMP documentation. Carting water from existing borefields requires regular re-grading of access tracks, increasing disturbance (compaction/windrows) to specific areas. Where access to a local water source via existing bores or new bores is determined of greater benefit than hauling water from the borefield, further external correspondence and consultation will be undertaken with DPIR, CLC and traditional owners.

4.1.8 Sediment and Erosion

NTO attempts to implement erosion and sedimentation management approaches cognisant of environmental risk and cost; adopting a strategic approach to the management and minimisation of erosion and sedimentation. The approach aims to deploy erosion and sediment control resources appropriate to maintain the integrity of the exploration activities and the risk that associated disturbance activities present to adjacent receiving environmental values.

Additional information is provided in sections 4.1.1, 4.1.2, 4.1.5, and 4.1.6. The listed section's detail the low risk sediment and erosion presents to the Officer Hill project, as there is minimal rainfall and this rainfall predominantly occurs during the wet season between November and March. Furthermore the terrain is relatively flat, with generally undefined water movement that is primarily sheet flow. In addition to this there are no permanent water bodies or ephemeral streams in the immediate vicinity of the proposed works.

Other key recommendations include:

- Excavation or clearing must not occur within 25m of a watercourse in order to minimise the risk of sediment runoff entering any watercourse(s);
- In selecting drill site locations, consideration shall be given to selecting sites and access routes that minimise opportunities for ground disturbance;
- Consideration shall be given to the type of drill rig to be used. A track- mounted or fly rig/man-portable rig is preferred, if practical, to minimise soil disturbance on paths of access;
- Access roads managed by NTO, where required, shall have erosion and sediment control measures in place to ensure that sediment loss is minimised and should be maintained;
- Any area of soil disturbance in close proximity to a watercourse should implement and maintain stormwater and sediment runoff management controls to ensure that sediment loss into nearby watercourses is minimised (where relevant);
- NTO shall progressively rehabilitate drill sites and access roads as soon as practical following the completion of the work. Stormwater and sediment control measures should be kept in place until the vegetation is in place and there is no potential for sediment erosion; and
- Erosion and sedimentation criteria shall be assessed during the rehabilitation completion auditing process.

4.1.9 Flora & Fauna

Biodiversity (flora and fauna) management for Officer Hill exploration project will align with the requirements specified in NTO Biodiversity and Land Management Plan.

In 2017, NTO commissioned Low Ecological Services (LES) to undertake a flora and fauna desktop assessment of the tenement EL 23150, prior to commencement of exploration activities, in line with DPIR recommendation.

4.1.9.1 Desktop Biodiversity Assessment

The Newmont Standard, setting the minimum requirements for the management of biodiversity (including at the exploration phase), is specified in Newmont's Global Biodiversity Management Standard. In accordance with this Standard, an initial assessment of biodiversity prior to any new disturbance (including for exploration activities) needs to be carried out to determine areas that may potentially support key biodiversity values.

Further advice is typically sought prior to any new exploration activities in existing or newly acquired tenements. NTO has commissioned an assessment of biodiversity that included a desktop study of known ecological databases (e.g. government managed regional flora and fauna databases) and a search and review of previous ecological studies completed in or near the area of interest.

The desktop biodiversity assessment, completed by Low Ecological Services, has been provided in Appendix A. The assessment guides NTOs understanding of biodiversity values that may be present within the area of interest and determine where exploration works may need to be protected or managed throughout the period NTO are undertaking exploration work within the area.

NTO ensures all approvals and commitments are obtained prior to any exploration activities (or associated field activities) are undertaken. Further information is provided in the Australia Generative Exploration Procedures Manual and Exploration Field Procedures on minimising potential impacts to biodiversity from exploration activities.

4.1.9.2 Flora

Three habitat types/landforms supporting various vegetation associations were identified during botanical surveys of the Granites mineral lease and associated exploration areas conducted in 1984 (Mt King Ecological Surveys, 1985). These were:

- Sand plains – dominant vegetation comprising hummock grasslands with trees and shrubs scattered or locally dominant, and forming low open/sparse woodlands, open/sparse shrublands, or open shrubs (the latter represented by usually monospecific thickets of Acacia spp.);
- Low rocky outcrops – hummock grassland with trees and shrubs scattered, some locally dominant and forming sparse shrubland open mixed shrubland; and
- Stream channels dissection low rocky outcrops – hummock grassland with trees and shrubs scattered, some locally dominant and forming sparse shrubland open mixed shrubland.

A total of 125 species were recorded by Mt King Ecological Surveys in 1985, the dominant families being Poaceae (27 species), Mimosaceae (14 species), Amaranthaceae (7 species) and Myrtaceae (7 species). No plants considered rare were recorded during the survey.

One species listed as Vulnerable under the EPBC Act is the Dwarf Desert Spike-rush (*Eleocharis papillosa*) may occur within the region but most records have occurred near ephemeral (temporary) wetlands, predominantly freshwater and semi-saline swamps.

4.1.9.2.1 Conservation Significance

EL 23150 sits within the South-west Tanami Desert site of Conservation Significance (SOCS) as per the Department of NRETAS document 'An inventory of sites of international and national significance for biodiversity values in the NT, 2009'. This area is characterised by a complex mosaic of landforms and habitats that are considered distinct form surrounding country including the paleodrainage system, alluvial plains, dunefields, sandplains, salt and freshwater lakes etc. This habitat supports a rich diversity of fauna and flora and various threatened species persist in the area including the Dwarf Desert Spike-rush (*Eleocharis papillosa*), Bilby (*Macrotis lagotis*), Brush-tailed Mulgara (*Dasycercus blythi*) and the Great Desert Skink (*Egernia kintorei*).

The primary threats to the South-west Tanami Desert site include fire, feral animals, weeds and invasive exotic plants. Mining, exploration and road work activities occur within the area and may have some impacts on sensitive habitats.

Numerous sites of botanical significance (SOBS) have been identified within the South-west Tanami Desert SOCS. SOBS are considered important for plant conservation and are designated as either nationally significant, bioregionally significant or of undetermined significance (Appendix C). EL23150 sits to the west of the Western Tanami Paleodrainage system (nationally significant) and to the south-east of the Mongrel Downs (bioregionally significant) SOBS (Appendix D). The exploration activities proposed on EL23150 under this MMP will not impact either SOBS.

Large palaeodrainage channels in the Tanami region have been identified as highly significant refugia (level 5, DEWHA) for vulnerable and other species due to their ability to provide protection from introduced species and to support greater plant production than the more elevated land systems (Morton et al., 2004).

No flora species listed under the *Territory Parks and Wildlife Conservation (TPWC) Act 2006* or the *Environmental Protection Biodiversity Conservation Act* (EPBC Act) for conservation significance were identified within a protected matters report from the DEWHA within a 20km radius of Officer Hill.

4.1.9.2.2 Cultural Significance

Though not listed under territory or federal law there are a number of species in the area that are considered significant to the Indigenous Warlpiri people. Trees of significance in the area greater than 2m tall should not be removed unless approved by the Aboriginal Traditional Owners. These include bloodwoods (*Corymbia opaca*), rough-leaved range gum (*Corymbia aspera*), red-bud mallee (*Eucalyptus pachyphylla*), beefwood (*Grevillea striata*), bull hakea (*Hakea chordophylla*) and flat leaved hakea (*Hakea macrocarpa*).

4.1.9.2.3 Invasive Species

Weed species identified to be present or previously identified within the region, inclusive of a current or historic presence on MLS 8 or MLS 154, are detailed below with occurrences specified as low, medium or high:

- Schedule Class B/C Weeds
  - *Argemone ochroleuca* - Mexican Poppy – Low.
  - *Calotropis procera* - Rubber Bush – Low.
  - *Cenchrus echinatus* - Mossman River Grass – Low.
  - *Tribulus cistoides, T. terrestris* – Caltrop – Low.
- Other species considered weeds in the Tanami region (non-indigenous):
  - *Cenchrus biflorus* - Gallon's Curse – Medium.
  - *Aerva javanica* - Kapok Bush – High.
  - *Acetosa vesicaria* - Ruby Dock – High.

- *Cynodon dactylon* – Couch Grass – Medium.
- *Chloris virgata* - Feathertop Rhodes Grass – Medium.
- *Cenchrus ciliaris* - Buffel Grass – High.
- Citrullus colocynthis - Paddy Melon – Low.
- *Malvastrum americanum* - Spiked Malvastrum – Moderate.
- *Trianthema portulacastrum* - Giant Pigweed – Moderate.

In relation to NTO's exploration activities, many of these tenements are absent of weed species due to the remote nature, limited traffic and inaccessibility to these sites. A DENR (NR Maps NT) search in 2016 determined no weed species listed to present on EL 23150.

To ensure no new weed species colonise in newly disturbed areas associated with exploration activities, all incoming vehicles and equipment completing works are required to report to the NTO Granites front gate and undergo a weed and seed inspection by NTO personnel prior to being granted entry. Additionally vehicles and mobile equipment are required to conduct regular washing and cleaning activities prior to mobilising to the exploration tenements.

If and where weeds are identified to establish on exploration tenements the main focus of control is spraying of areas around the rehabilitated, newly disturbed or high occurrence areas. If a spraying program is required it will be managed under the guidance of the NTO Environment department and is undertaken by environment staff, other NTO staff and contractors from individual work areas of responsibility.

All incurrences of Class B/C weeds shall be managed to eradication of the identified instance to mitigate the potential of further dispersion. Following eradication, impacted areas are routinely inspected to allow prompt identification of any seed body germination.

As such, weed management on EL 23150 will be conducted in accordance with the NTO Weed Management Plan.

4.1.9.3 Fauna

Gibson (1986) in a wide ranging survey of the Tanami found three locally abundant but regionally and nationally rare mammals to be widespread:

- Spectacled Hare-wallaby (*Lagorchestes conspicillatus*)
- Brush-tailed Mulgara *(Dasycercis blythii);* and
- Greater Bilby *(Macrotis lagotis).*

The fauna identified in 1990 by Low et al. in the Granites to DBS region that are distributed widely, in appropriate habitats over the Tanami, with the exception of three regionally rare animals:

- Greater Bilby *(Macrotis lagotis);*
- Brush-tailed Mulgara *(Dasycercis blythii);* and
- Great Desert Skink *(Egernia kintorei).*

Scattered over the Calcrete rises in the Jumbuck borefield are relict warrens of Burrowing Bettongs (*Bettongia lesueur*), which had been abundant in this area before they became extinct on the mainland approximately 50 years ago.

Evidence of populations of Greater Bilby (*Macrotis lagotis*) has been recorded along the DBS haul road and in the Billabong and Jumbuck borefields. Bilby populations were also present along the Windy Hill (Minotaur) haul road prior to and during operation. The Bilby has been identified on Oberon site from tracks, scats and dung whilst tracks of Mulgara were possibly identified in the area but were not confirmed.

Since 2005, NTO has overseen the completion, in collaboration with the CLC, of fauna and flora surveys within a 200km radius of the existing Mineral Leases (MLS 8 and MLS 154). These surveys were initially intended to assess the impacts of the operations on biodiversity of the Tanami, but they have also been a source of employment for Indigenous Rangers from Yuendumu and Lajamanu and have provided substantial information on the biodiversity of the region. To date, eight surveys have been completed.

4.1.9.3.1 Conservation Significance

Fauna species listed under the NT Territory Parks and Wildlife Conservation Act 2011 (TPWC) or Commonwealth EPBC Act for conservation significance were identified within a protected matters report from the DEWHA within a 20km radius of in the Officer Hill and general NTO area as of November 2018 are shown Table 5, along with listings under the NT TPWC Act.

Only one reptile species identified as inhabiting or known to potentially inhabit the survey area, the Great Desert Skink (Liopholis kintorei), is considered to be vulnerable under the EPBC Act. All other reptile species identified are common throughout the Tanami region. Tracks of the Great Desert Skink were identified north east of DBS.

The Greater Bilby (Macrotis lagotis) is listed as Vulnerable and is known to occur in the region, whilst the Central Rock-rat (Zyzomys pedunculatus) is listed as Critically Endangered and whilst the species habitat may occur within the area, it has not been recorded since the 1950s. The Brush-tailed Mulgara (Dasycercus blythi) is listed as Least Concern on the EPBC register but is listed as Vulnerable under the TPWC Act.

The Crest-tailed Mulgara (Dasycercus cristicauda) is listed as Vulnerable under both EPBC and TPWC; however does not exist in the area despite being identified within early fauna surveys of the region. This is due to these fauna surveys being undertaken prior the reclassification Crest-tailed Mulgara (D. cristicauda) in 2006 when scientific research identified the Brush-tailed Mulgara (D. blythi) and distinguished the two Mulgara species separately for the first time. Some of the historical fauna sampling has listed the Crest-tailed Mulgara (D. cristicauda), and at this time this was accurately reported, however any future reference of these reports are to note that the mulgara species found at NTO is Brush-tailed Mulgara (D. blythii).

Table 5 - Rare flora/fauna species or species habitat likely to occur within area listed under the TPWC and EPBC (review completed 22 November 2018)

Scientific name	Common name	Status		PMST	NT Fauna / Flora Atlas	Tanami RBM	Likelihood of occurrence	Risk of impact	Preferred Habitat
		TPWC	EPBC						
Mammals									
Dasycercus blythi	Brush-Tailed Mulgara	VU	LC		X	X	High	Low	Hummock grass (Triodia spp.) deserts and also inhabited gravelly plains, dunes and mulga (Acacia aneura) low woodlands with tussock grass.
Lagorchestes conspicillatus leichardti	Spectacled Hare-Wallaby	LC			X		Low	Low	Acacia shirleyi / Macropteranthes kekwickii thickets with an open understory.
Macrotis lagotis	Greater Bilby	VU	VU	X	X	X	High (Magellan area) Moderate (Pegasus area)	Low	Acacia shrublands and hummock grasslands.
Notoryctes typhlops	Southern Marsupial Mole	VU	LC				Low - Moderate	Low	Sand-dunes, sandy interdunal flats, and sandy flood plains.
Notomys amplus	Short-Tailed Hopping-Mouse	EX	EX		X		None (considered locally extinct)	None	Sand dunes and sand plains.
Onychogalea lunata	Crescent Nailtail Wallaby	EX	EX		X		None (considered locally extinct)	None	Ecotones between sandy loams and clay – open woodlands with tussock grasslands and shrublands.
Onychogalea unguifera	Northern Nailtail Wallaby	NT			X	X	Low	Low	Ecotones between sandy loams and clay – open woodlands with tussock grasslands and shrublands.
Pseudomys nanus	Western Chestnut Mouse	NT	LC		X	X	Low (but seasonally moderate)	Low	Eucalypt dominate Grasslands and sandy volcanic and lateritic soils.
Trichosurus vulpecula vulpecula	Common Brushtail Possum (Southern N.T.)	EN			X		None (considered locally extinct)	None	River systems supporting large eucalypts, coolabah claypans and spinifex grasslands with a shrubby over story.

Scientific name	Common name	Status		PMST	NT Fauna / Flora Atlas	Tanami RBM	Likelihood of occurrence	Risk of impact	Preferred Habitat
		TPWC	EPBC						
Zyzomys pedunculatus	Central Rock-Rat	EN	CR	X	X		None (considered locally extinct)	None	Quartzite ridge tops and cliffs supporting spinifex Triodia spp. grasslands or shrublands, perhaps with scattered trees.
Birds									
Amytornis striatus	Striated Grasswren		LC		X	X	Low	Low	Open to semi open habitats in arid and semi-arid zones (spinifex Triodia).
Ardeotis australis	Australian Bustard	NT	LC		X	X	High	Low	Grasslands, plains and open woodlands.
Calidris ferruginea	Curlew Sandpiper	VU	CR	X			Low	Low	Ponds, non-tidal swamps and estuaries.
Cinclosoma castaneothorax	Chestnut-Breasted Quail-Thrush	NT	LC		X		Low	Low	Shrubland - Subtropical/Tropical Dry.
Dromaius novaehollandiae	Emu	NT	LC		X	X	Low	Low	Open to semi-open habitats.
Lophoictinia isura	Square-Tailed Kite	LCNT	LC		X		Low	Low	Eucalypt forest and woodlands.
Pezoporus occidentalis	Night Parrot	CR	EN	X			Low	Unknown	Triodia Grasslands and chenopod shrublands in semi -arid and arid zones.
Phaps histrionica	Flock Bronzewing	NT	LC		X	X	Low	Low	Treeless grass plains.
Polytelis alexandrae	Princess Parrot	VU	VU	X			Low	Low	Sand dunes.
Pyrrholaemus brunneus	Redthroat	NT	LC		X		Moderate	Low	Shrubland.
Rostratula australis	Australian Painted Snipe	VU	EN	X			Low	Low	Terrestrial shallow freshwater wetlands and ephemeral (recently flooded wetlands).
Falco hypoleucos	Grey Falcon	VU			X	X	Low	Low	Lightly timbered lowland plains, typically on inland drainage systems.
Migratory Birds									
Actitis hypoleucos	Common Sandpiper	Mi, Ma	LC		J, C, R, B		Low	Low	Inundated grasslands, where floodwaters are temporary or receding.
Apus pacificus	Fork-Tailed Swift	Mi, Ma	LC		J, C, R		Low	Low	Boreal and temperate forests.
Ardea alba	Great Egret		TH		-		Low	Low	Wet areas and damp grasslands.
Ardea ibis	Cattle Egret		LC		-		Low	Low	Grasslands, woodlands and wetlands.
Calidris acuminata	Sharp-Tailed Sandpiper	Mi, Ma	LC		J, C, R, B		Low	Low	Wet areas and damp grasslands.

Scientific name	Common name	Status		PMST	NT Fauna / Flora Atlas	Tanami RBM	Likelihood of occurrence	Risk of impact	Preferred Habitat
		TPWC	EPBC						
Calidris ferruginea	Curlew Sandpiper	Mi, Ma, VU	CR		J, C, R, B		Low	Low	Ponds, non-tidal swamps and estuaries.
Calidris melanotos	Pectoral Sandpiper	Mi, Ma	DD		J, C, R, B		Low	Low	Wet areas and damp grasslands.
Charadrius veredus	Oriental Plover	Mi, Ma	TH		J, C, R, B		Low	Low	Timbered Habitats.
Chrysococcyx osculans	Black-Eared Cuckoo		LC				Low	Low	
Glareola maldivarum	Oriental Pratincole	Mi, Ma	LC		C, J, R		Low	Low	Ponds, non-tidal swamps and estuaries.
Hirundo rustica	Barn Swallow	Mi, Ma	TH		C, J, R		Low	Low	Tussock grasslands, freshwater wetlands, paperbark Melaleuca woodlands.
Merops ornatus	Rainbow Bee-Eater	Ma	LC		-		Moderate	Low	Open forest and woodlands and shrublands.
Motacilla cinerea	Grey Wagtail	Mi, Ma	TH		C, J, R		Low	Low	Savannas, Boreal Forests, Deserts and Xeric Shrublands.
Motacilla flava	Yellow Wagtail	Mi, Ma	TH		C, J, R		Low	Low	Large forest clearings.
Reptiles									
Aspidites ramsayi	Woma Python	NT	LC		X	X	Moderate	Low	Mainly sand and occasionally rocky habitat
Liopholis kintorei	Great Desert Skink	VU	VU	X	X	X	Moderate	Low	Red sand plains and sand ridges. Hummock grass, sand plains and dune field swales.
Pseudechis australis	King Brown Snake	NT			X		Moderate	Low	Acacia shrublands and hummock grasslands.
Plants									
Trianthema glossostigma	Aizoaceae	NT			X		High	Low	Rocky sandy soils, lateritic loam. Plains, ridges
Trachymene inflata	Araliaceae	NT			X		Low	Low	Low quartzite ridge amongst rocks under *Grevillea wickhamii*
Heliotropium sphaericum	Boraginaceae	DD			X		High	Low	Red soils, recorded in recently disturbed *Triodia pungens* sandplain with *Acacia stipuligera; Corchorus sidoides*

Scientific name	Common name	Status		PMST	NT Fauna / Flora Atlas	Tanami RBM	Likelihood of occurrence	Risk of impact	Preferred Habitat
		TPWC	EPBC						
Bonamia alatisemina	Convolvulaceae	DD			X		High	Low	Sand. Sand plains. Record observed in disturbed spinifex community
Acacia pachycarpa	Fabaceae	DD			X		Low	Low	Clay. Floodplains, cracking clay pans
Acacia synchronicia	Fabaceae	DD			X		Moderate	Low	Rocky sand, clay or loam, limestone, quartz, lateritic rise
Gompholobium simplicifolium	Fabaceae	NT			X		Moderate	Low	Red sand
Dasymalla chorisepala	Lamiaceae	DD			X		Moderate	Low	Red sand, dune swales
Peplidium sp. Tanami	Phrymaceae	DD			X		Low	Low	Moist red clay or sand, edges of claypans
Ectrosia lasioclada	Poaceae	DD			X		Low	Low	Sandy soils on the edge of clay pans, with other grasses in savanna woodland or forest
Tribulus sp. long-styled eichlerianus	Zygophyllaceae	DD			X		Moderate	Low	Red clay loam with melaleuca glomerata, Aristida browniana

* EPBC Listing at a population level: EX: extinct, EW: extinct in the wild, CR: critically endangered, EN: endangered, VU: vulnerable, NT: near threatened.DD: Data Deficient, Mi: Migratory; Ma: Marine International Agreement; J: Japan-Australia Migratory Bird Agreement; C: China-Australia Migratory Bird Agreement; R: Republic of Korea-Australia Migratory Bird Agreement; B: Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animals).

4.1.9.3.2 Cultural Significance

The Dingo (*Canis lupus dingo*) is present throughout the Tanami and is commonly sighted within mine operational and accommodation areas. A Warlpiri Aboriginal people 'dingo dreaming' site is located about 100km distant from operational areas. The Warlpiri name for dingo is 'warnapari'.

NTO has a long-term dingo management plan which was developed in 2006. The aim of the plan is to minimise the level of dependence of dingoes on mining activities (i.e. food and water resources) and to reduce potential human-dingo interaction on the leases to ensure the protection of the Dingo and the safety of site personnel.

4.1.9.3.3 Invasive Species

Rabbits (*Oryctolagus cuniculus*) were known to occupy much of the area from at least the early 1920's (Low Ecological Services et al. 1983) but numbers are now low and populations very disjunct. There are infrequent sightings of rabbits along the haul road and mineral leases. Occasional reports are also received for sightings of other feral species in or around the lease areas including cats (*Felis catus*), foxes (*Vulpes vulpes*) and camels (*Camelus dromedaries*). Environmental impacts from the camel (*C. dromedaries*), domestic dog (*C. lupus familiaris*), house mouse (*M. musculus),* feral cat (*F. catus*) and European red fox (*V. vulpes*) are listed as a species or species habitat likely to occur in the area, under the *EPBC Act.*

4.1.10 Sacred Sites

NTO respects and adequately protects all sites with cultural or religious significance for Indigenous peoples in the facility's sphere of influence. Through agreement with the CLC the specific details regarding the location and distribution of sacred sites within and adjacent to the NTO leases are kept confidential.

4.1.11 Land Use

The Officer Hill Exploration Project is located on Aboriginal Freehold Land granted as inalienable freehold title to the Central Desert Aboriginal Land Trust in 1980, pursuant to the *Aboriginal Land Rights Act 1976 (NT)*. The land is managed on behalf of the Traditional Owners by the Central Desert Aboriginal Land Trust, administered by the CLC. Much of the land in the region is of high ceremonial and cultural value to the Traditional Owners from the Warlpiri language group. Exploration activities are provided to the CLC in the form of an Exploration Works Program and corresponding Sacred Sites Clearance Certificate (SSCC).

Today many of the Warlpiri people reside in the larger communities of Lajamanu, Yuendumu and Balgo. The nearest settlements are Yuendumu 260km south of the Granites, Lajamanu approximately 340km north north-east of the Granites, Barrow Creek 240km north of Alice Springs and Willowra 300km north north-west of Alice Springs. There are a number of other smaller communities and outstations within the region.

4.1.12 Site Disturbance Activities

All site disturbance activities will be conducted in line with the requirements specified in the NTO Biodiversity and Land Management Plan and the Site Disturbance Permit Procedure.

The clearing will be completed in a "blade-up" fashion wherever possible so as to remove surficial vegetation while imparting minimal disturbance to the topsoil and rootstock.

Where possible, NTO will consider re-opening old tracks rather than creating new tracks, as demonstrated during the 2018 campaign. This process will follow a risk-based approach and be conducted in line with the NTO Site Disturbance Permit Procedure.

4.1.13 Vehicle Movements

Exploration drilling will create increased levels of traffic in the local area; related to the mobilisation of the drill rig and associated equipment to and away from the exploration site, the transport of drill core from site and the transport of staff to and from the site.

Irresponsible vehicle movements associated with exploration activities may result in injury or mortality of fauna, burrow damage, and habitat damage of threatened species. Irresponsible vehicle movements may include off road driving, speeding, and general disobedience of NTO's traffic management plans and authorisations to drive (i.e. appropriate inductions and responding to signage).

Overall the traffic volume will not be significant. The access tracks to EL 23150 are not completely established or utilised regularly. The chance of road kill for any threatened species considered to persist within the project area is greatest overnight, as these species are predominantly nocturnal. The great desert skink is semi-diurnal, as it may emerge in the late afternoon for sun light. Therefore, the risk of accidental road kill is highest at night time, when site traffic is anticipated to be at its lowest. Furthermore, the traffic will be minimised by the establishment of the camp for overnight stays, this will reduce the traffic during twilight and overnight when nocturnal fauna activity increases.

It is however recommended minimal driving activities occur during the night, that speed restriction are enforced travelling on the access tracks and off-road, and through continuous education of employees (i.e. through inductions, tool box meetings, etc.) to inform relevant exploration personnel of the potential presence of threatened species within the project area.

4.1.14 Noise

The primary proposed activities forming a source of noise will be during drilling. Sources of noise from drill operation consist of that from a diesel engine which powers the pumps and hydraulics and air compressors. There may also be noise events such as clangs and bangs that occur in making up and breaking out the drill string.

The engine noise is generally not an issue in the remote areas and in rural environments, unless the drill hole location is in close proximity to a community; however noise may impact on local fauna populations. It is likely that the noise impacts will be localised to the drill sites and camp, and have no major effect on the wider region.

4.1.15 Dust

The selected drill method (multi-purpose RC/diamond) does not inherently create dust, because the drill process is assisted by downhole circulation of fluid. However, dust can be generated from soil disturbance activities during the formation of the drill pad or site access tracks (if required). The land disturbance activities are managed in accordance with the NTO Biodiversity and Land Management Plan and associated Site Disturbance Procedure.

It is recommended that in order to minimise exploration drilling related dust the disturbance of soil is kept to a minimum. In especially dry and/or windy conditions a water truck can be used to damp down and suppress dust if required.

4.1.16 Fire

Fire is a frequent and significant factor in the desert landscapes of this region, and strongly influences the structure and composition of the vegetation in the region (Latz 1995). The incidence of fire is associated with lightning strikes in the summer and burning off as a cultural land management practice of Traditional Owners. Fire scar mapping data (NAFI 2016) has identified that a large portion of the project area was burnt in late 2015. Wind erosion is extensive after fires on sand dunes and sand ridges along the western margin of the palaeochannel which compose mainly of silicious quartz sands. Substantial areas of land have burnt from extensive fires for several years within the region where both annual and perennial species have formed patchy, variable aged stands.

5 ENVIRONMENTAL MANAGEMENT SYSTEMS / PLAN

NTO is committed to achieving the highest standard of environmental and social management through responsible management of activities throughout the various stages of Officer Hill Exploration Project's life. The Sustainability and External Relations division is focused on differentiating Newmont through its environmental performance, reputation, and practice; upholding the social licence to operate as reflected in the S&ER mission statement as detailed below.

> *'To drive continuous improvement in environmental and social performance, consistent with the principles of sustainable development, with the same rigor as the financial and production aspects of our business, to build our reputation capital, ensuring our ability to operate around the world, now and in the future.'*

5.1 Environmental Policy & Responsibilities

NTO operates under the Newmont Australia S&ER Policies, included in Appendix B. S&ER and HS&S (Health Safety and Security) policies are reviewed on an annual basis or as required by the management team. The policies are signed by the Regional Senior Vice President, which are then made available on the Newmont Australia Intranet site and displayed in various work areas. The last review was in June 2017.

Overall delivery of environmental standard commitments supports achievement of NTO long-term goals, by better allocation of resources, more involvement by all levels of management, and constant review and feedback on performance to minimise losses and maximise opportunities. Table 6 defines the individual role specific responsibilities (S&ER) for the management of the environmental and social aspects of the operations.

Table 6 - S&ER Responsibilities at NTO

Role	Responsibility
General Manager (GM)	• Through the annual Budget and Business Planning processes allocate sufficient employee and financial resources to effectively establish, implement and maintain the NTO Integrated Management System (IMS) to meet the requirements of Newmont Corporate Standards and ISO14001. Orchestrate the NTO annual Business Planning process including setting annual overall site HS&S, S&ER Objectives, Targets and key performance indicators (KPIs) and the accompanying business plans which drive continuous improvement. • Develop position descriptions for all direct reports which include responsibilities for their actual operational role, meeting legal and other requirements and the NTO IMS. • Coordinate Management Review processes as outlined in Management Review SMP. • Review and sign off the regional policies in consultation with the Leadership Team. • Provide resources for effective implementation of the endorsed regional policies and the NTO Strategic Plans.
Group Executive Sustainability and External Relations (Perth based)	• Provide regional support and guidance on all environmental aspects at NTO.

Role	Responsibility
Group Executive Exploration (Perth based)	• Ensuring S&ER performance of any prospective Joint Venture partners is assessed prior to entering into agreements. • Ensuring assessment of environmental liability and heritage issues is completed prior to acquisition of new projects or entering into a joint venture. • Ensuring project acquisitions are undertaken in accordance with Newmont's Investment Policy including ensuring the content for any Study Reports for Investments meets the framework and expectations. • Ensuring all exploration related environmental disturbances are rehabilitated and audited prior to divestment or relinquishment unless otherwise agreed with the landowners or tenement assignee. • Ensuring all necessary authorisations are obtained prior to tenement relinquishment.
Regional Exploration Manager (Perth based)	• Ensure all necessary authorisations are obtained prior to commencement of any field based exploration activities; • Ensure all necessary heritage clearances and associated land access permissions are obtained prior to commencement of any field based exploration activities; • Ensure that all field based exploration activities are undertaken in accordance with the granted authorisations, specifically but not limited to: o Type and quantity of exploration activities o Regulatory and voluntary commitments o S&ER requirements and commitments o Approvals specific condition
Sustainability and External Relations Manager	• Communication of Environmental issues and statistics as well as IMS related information at Management Review Meetings. • Ensure environmental monitoring programs are completed. • Ensure the implementation of annual environmental site strategies. • Develop and maintain Beyond the Mine distribution lists. • Communication of community relations issues and statistics as well as IMS related information at Management Review Meetings.
Exploration Department Personnel	• Complete drill site planning in line with procedures. • Ensure S&ER involvement throughout planning and approval process. • Reinforce S&ER and safety protocols and procedures at regular toolbox safety meetings. • Complete exploration monitoring and assessment programs as required. • Ensure adequate resources and enough time is allowed for securing necessary approvals and licences prior to exploration teams undertaking work. • Ensure records of disturbance areas, rehabilitation undertaken and audits conducted shall be documented and recorded in Newmont's document management system.
Site Management Team	• Communicate objectives, targets and KPIs and plans to site employees and contractors. • Review and approve the Regional Policies and communicate to own departmental personnel. • Ensure Department participation in all Management Review Meetings. • Prepare contributions for all Meetings as defined and appropriate in this document. • Prepare and present reports in Management Review meetings in accordance with the established agendas. • Ensure actions arising from Management Review meetings are communicated accordingly in their department of responsibility to ensure the action is completed.
Site Personnel	• Demonstrate commitment to the Newmont Values and NTO endorsed Regional Policies at all times while representing the company. • Complete required site inductions and comply with the requirements for environmental management detailed in inductions and site and departmental procedures.

5.2 Statutory & Non-Statutory Requirements

5.2.1 Statutory Requirements

The three primary pieces of legislation regulating the operations at NTO includes:

- Mining Management Act (NT) 2018;
- Work Health and Safety Act (NT) 2011; and
- Aboriginal Land Rights (Northern Territory) Act 1976.

The Mineral Titles Act (NT) 2010 regulates the exploration for, and extraction and processing of minerals.

Table 7 - Summary of applicable legislation for NTO

Legislation	Comments
Commonwealth	
Aboriginal & Torres Strait Islander Heritage Protection Act	The preservation and protection from injury or desecration, areas and objects of particular significance to Aboriginal peoples.
Aboriginal Land Rights (Northern Territory) Act and Aboriginal Land Rights (Northern Territory) Regulations	Legislation affects the grant of a mineral lease on Aboriginal Freehold land.
Energy Efficiencies Opportunities Act and Energy Efficiencies Regulations	Identifying, evaluating and reporting publicly on cost effective energy savings opportunities.
Environment Protection & Biodiversity Conservation Act and Environment Protection & Biodiversity Conservation Regulations	Deals with actions that are likely to have a significant impact on matters of national environmental significance.
National Environment Protection Measures (Implementation) Act and National Environmental Protection Regulations	Provide information on the type and amount of pollution emitted to the air, land and water due to the operations (National Pollutant Inventory Reporting).
National Greenhouse and Energy Reporting Act and National Greenhouse Energy Reporting Regulations	Details greenhouse and energy reporting requirements.
Transport of Dangerous Goods by Road and Rail (National Uniform Legislation) Amendment Act and Transport of Dangerous Goods by Road and Rail (National Uniform Legislation) Regulations	To set the obligations of persons transporting dangerous goods and reduce the risks as far as practicable.
Northern Territory	
Bushfires Act and Bushfires Regulations	Aims To minimise the risk of fire causing destruction. Outlines fire prevention and control and infringement notices.
Dangerous Goods Act and Dangerous Goods Regulations	Details the obligations and the addressing of risks associated with the transport, storage and use of dangerous goods.
Heritage Act and Heritage Regulations	Recording, conservation and protection of heritage and archaeological places and objects.
Mineral Royalty Act	Outlines the requirements to calculate and pay royalties to the Northern Territory Government.
Mineral Titles Act and Mineral Titles Regulations	The project will be operated in accordance with the conditions of the mineral lease.
Mining Management Act and Mining Management Regulations	Authorisation for operation, management of and protection of the Environment of mining operations. Development of the Mining Management Plan.
Northern Territory Aboriginal Sacred Sites Act and Northern Territory Aboriginal Sacred Sites Regulations	Management and protection of Aboriginal archaeological sites and historic sites.
Plant Health Act and Plant Health Regulations	Aims to ensure appropriate actions can be taken for the control of pests.

Legislation	Comments
Poisons and Dangerous Drugs Act and Poisons and Dangerous Drugs Regulations	Regulates the storage and use of poisonous substances and prescribes cyanide permitting.
Soil Conservation and Land Utilisation Act	Soil conservation and management of erosion and land reclamation
Territory Parks and Wildlife Conservation Act and Territory Parks and Wildlife Regulations	Protection and conservation of native wildlife.
Traffic Act and Traffic Regulations	Crossing and use of the Tanami Road by vehicles.
Waste Management and Pollution Control Act and Waste Management and Pollution Control Regulations	NT's primary legislation for pollution prevention and waste management – creates offences of serious environmental harm, material environmental harm and environmental nuisance.
Water Act and Water Regulations	Contamination of groundwater or any other waters which leave the mineral lease.
Weeds Management Act and Weeds Management Regulations	Aims to prevent the spread of weeds in, into and out of the Territory and to ensure that the management of weeds is an integral component of land management.
Work Health and Safety (National Uniform Legislation) Act and Work Health and Safety (National Uniform Legislation) Regulations	Promote health and safety in the workplace and other purposes.
Central Land Council Mining Agreements	Deed for Exploration Exploration Works Program

5.2.1.1 Permits and Conditions

Permits and conditions for the Officer Hill Exploration Project include:

- Exploration Licences and associated conditions;
- Sacred Site Clearance Certificates issued by the CLC;
- Permits to enter Aboriginal Land issued by the CLC; and
- Agreements with the CLC on behalf of Traditional Owners pursuant to the Aboriginal Land Rights (Northern Territory) Act 1976.

5.2.2 Non-statutory Requirements

NTO is committed to achieving the highest standard of environmental and social management through the responsible management of activities throughout the various stages of the Officer Hill Exploration Project. Newmont has adopted numerous voluntary commitments aligned with best practice and industry leading performance in health, safety and the environment, several of which are detailed in Table 8.

Table 8 - Non-statutory Obligations

Organisation	Comments
AccountAbility's AA1000 Assurance Standard	This standard is built to improve how companies manage, report and continuously improve their sustainability performance
Extractive Industries Transparency Initiative	Newmont is one of 28 global companies actively involved with EITI's efforts to improve governance in resource-rich countries. The Initiative's efforts focus primarily on building the capacity and will of national governments to transparently account for revenues received from extractive industries; Newmont supports this effort by openly disclosing its tax and royalty payments. eitransparency.org/en/initiatives/paci/index.htm
Global Reporting Initiative	Newmont's global Sustainability Report is compiled in accordance with the GRI G3 guidelines. (http://sustainabilityreport.newmont.com)

Organisation	Comments
Global Sullivan Principles of Social Responsibility	Newmont upholds the Sullivan Principles as part of its efforts to protect human rights and promote social justice and economic opportunity.
Initiative for Responsible Mining Assurance	Newmont is actively involved in this multi-sector effort designed to develop and establish a voluntary system to independently verify compliance with environmental, human rights and social standards for mining operations. IRMA is building upon the existing foundation of research, tools and initiatives to develop standards for the mining industry. responsiblemining.net
International Council on Mining and Metals (ICMM) Sustainable Development Framework	As a founding member of ICMM, Newmont commits to implementing ICMM's 10 Principles for Sustainable Development, which defines aspects of corporate governance, environmental stewardship and community engagement that are crucial to Newmont's ability to contribute to sustainable development. http://www.icmm.com/
International Cyanide Management Institute's Cyanide Management Code	In 2005, Newmont became one of the first signatories of the Code, which aims to improve the safe transport, storage and use of cyanide to protect human health and reduce the potential for environmental harm. cyanidecode.org
International Organization for Standardisation Environmental Management System Standard	The ISO 14001 standard requires a company to have an environmental management system in place that identifies and controls the environmental impacts of its activities, provides the opportunity to continually improve its environmental performance, and implements a systematic approach to setting and achieving environmental objectives. Newmont has succeeded in having the environmental management systems at all of its Australian mines certified against the ISO 14001 standard by 2011 and has since continued to maintain certification. iso.org
Occupational Health and Safety Audit System 18001	OHSAS' standards define requirements for our occupational health and safety management system, and call for independent verification.
Partnering Against Corruption Initiative (PACI)	Newmont is a founding member and signatory to the World Economic Forum's Partnering Against Corruption Initiative. Newmont put in place a zero-tolerance policy for bribery and corruption. In addition, employees across the company must complete a comprehensive training program to prevent corruption, based on PACI's principles. www.weforum.org/en/initiatives/paci/index.htm
Publish What You Pay	This coalition of 300 NGOs calls for the mandatory disclosure of payments members of the extractive industry make to governments to develop a country's natural resources.
The Carbon Disclosure Project (CDP)	Newmont participates in this voluntary annual disclosure and in 2008 was added to CDP's Carbon Disclosure Leadership Index. The CDP is an independent not-for-profit organisation that acts as an intermediary between shareholders and corporations on all climate change related issues, providing primary climate change data from the world's largest corporations to the global market place. cdproject.net
The Climate Registry (TRC)	Newmont is a Founding Reporter and one of the first 100 companies to join TCR. TCR is a non-profit organization established to publicly disclose Reporters greenhouse gas emissions in a common, accurate and transparent manner, consistent across industry sectors and borders. theclimateregistry.org
United Nations Global Compact	Newmont is a participant in the United Nations Global Compact, which seeks to promote responsible corporate citizenship so that the private sector – in partnership with other social actors – can help realize a more sustainable and inclusive global economy. unglobalcompact.org
Voluntary Principles on Security and Human Rights (VPSHR)	Newmont participates in the VPSHR as part of a global effort to promote the protection of human rights. The principles are designed to guide companies in maintaining the safety and security of their operations within a framework that ensures respect for human rights and fundamental freedoms. voluntaryprinciples.org
World Gold Council (WGC)	The WGC promotes responsible mining practices across the gold industry. Our conflict-free gold standard and our approach to reporting all-in sustaining costs are largely informed by guidelines and standards developed by the WGC and its member companies.

5.3 Inductions & Training

5.3.1 Inductions

All employees and contractors attend induction training prior to commencing work at NTO, to understand the organisational, safety, sustainability and external relations requirements for the site. There are three levels of site entry, each with a different level of induction.

S&ER and exploration risks and management processes are described in all three induction levels with increasing content from short-term to permanent personnel. Inductions are reviewed and updated as required (i.e. to reflect a change in policy, procedure or personnel).

Cross Cultural Awareness (CCA) training is regularly provided for all NTO personnel to promote understanding of and appreciation for particular cultural values and norms that apply within the local region.

General Site Induction

As a minimum, the general site induction training provides information covering the following categories:

- NMC History, Values and Newmont Australia region policies;
- NTO IMS roles and responsibilities;
- Sustainability and External Relations;
- Workplace culture / behaviour including equal employment opportunities (EEO);
- General safety;
- Safety leadership;
- Isolation requirement awareness;
- Traffic management;
- Emergency procedures; and
- Managing hazards.

Contractors / Short Term Worker Induction

All short term workers/contactors (less than 14 days on site, 4 times a year) attending site are required to undertake a Contractors / Short Term Worker Induction, as a minimum, the training provides information covering the following categories:

- Safety and emergency systems;
- Medical Centre;
- Incident and accident reporting;
- Work area authorisation;
- Chemical management;
- Permit system; and
- Vehicle and mobile equipment standards.

Visitor Induction

All visitors (less than 7 days on site) attending site are required to undertake a brief Visitor Induction, as a minimum, the visitor's induction provides information covering the following categories:

- Emergency information;
- Medical Centre;
- PPE;
- Fitness for work;

- Site escort;
- Sign in, visitors pass;
- Site and village rules; and
- Medical form.

Work area specific inductions may also be required and completion of these is dependent on the work being conducted by each individual. Records of these inductions are maintained by each department for their personnel.

5.3.2 Training

NTO ensures all employees and contractors are adequately trained and assessed as competent to carry out their duties in a safe, efficient and environmentally and socially responsible manner. NTO document and implement processes to assure the integrity and accuracy of training records and to demonstrate due diligence. This includes:

- Retention, archival and retrieval of training records;
- Verification of qualifications and experience of all personnel working within the operation;
- Enrolments and participation in training programs;
- Training and/or assessment materials;
- Compliance with regulatory and other requirements; and
- Review and evaluation of training records.

Training needs are determined through consultation with the training department through some or a combination of the following processes:

- Classification / role / job descriptions / specific tasks;
- NTO risk assessments / risk register;
- Plant, equipment and / or process change;
- Audits / continuous improvement;
- Reassessment of competence;
- Legislative requirements / site policies and procedures;
- Business plans;
- IMS requirements;
- Accident and incident investigation reports; and
- Other as appropriate

Competency profiles are developed from the outcomes of training needs analysis and used to outline competencies, skills and training required for positions on site. Competency profiles include unique or specialty competencies skills and training requirements within each particular discipline or department. Skills and training identified in the competency profiles specific to exploration activities include:

- Remote area safety and first aid training;
- Manual handling training;
- Forklift operation training;
- Cross cultural awareness training;
- Snake handling training;
- 4WD driver training;
- Tyre Changing training;
- Heavy vehicle operation training as required; and

- GPS usage and basic field exploration techniques.

In addition to the above; all employees receive training in Environment and Social Responsibility. This is inclusive of:

- Site disturbance and clearing activities;
- Cultural significance sites, flora and fauna;
- Hazardous materials management;
- Waste management;
- Sustainable water use; and
- Site rehabilitation.

5.4 Identification of Environmental Aspects & Impacts

The identification and management of environmental aspects and impacts specific to operations and the exploration program is achieved through the sites Integrated Management System (IMS) which combines S&ER and HS&S certifications for ISO14001 and OHSAS18001.

The IMS framework provides NTO means to manage and minimise risks, comply with legislation and standards, and deliver continual improvement; through the Plan-Do-Check-Act (PDCA) methodology; supporting social responsibility and environmental performance. Performance is based around five core sections, with seventeen key IMS Standards, and a selection of Discipline Specific and Technical Standards. A copy of the IMS manual is attached as Appendix C. Management of significant environmental aspects and impact mitigation is undertaken through aspect specific management plans and the NTO risk register which defines the risks and associated controls to ensure these are mitigated.

5.4.1 S&ER Discipline Specific Standards

S&ER Discipline Specific Standards detail minimum controls expected to be in place at NTO. Management plans and procedures are created for each of the standards, which show how each are addressed at operation. The standards are audited on a three yearly basis at NTO by trained internal auditors, as per the NTO audit schedule. S&ER Discipline Specific Standards applicable to Officer Hill Exploration Project are presented in Table 9.

Table 9 - Sustainability & External Relations Standards

S&ER Standard	Purpose
Air Emissions (NEM-SER-STA-006)	Set the minimum requirements to assess and manage air emissions of regulated pollutants to be protective of human health and the environment.
Hazardous Materials (NEM-SER-STA-005)	To set the minimum requirements for the management of hazardous materials (inclusive of hydrocarbons, cyanide and other hazardous chemicals) in order to protect human health and the environment.
Waste Management (NEM-SER-STA-007)	To set the minimum requirements for the management of hazardous and non-hazardous wastes and wastewater generated at Newmont Sites, such that human health and the environment are protected.
Water Management (NEM-SER-STA-001)	To set the minimum Newmont requirements to proactively plan and manage water from exploration to post-closure in accordance with Newmont's Water Strategy such that human health, community water needs, and the environment are protected.
Closure and Reclamation (NEM-SER-STA-003)	To set the minimum requirements for planning and management of closure and reclamation activities from exploration through post-closure in accordance with Newmont's strategic objectives in order to protect human health, community needs, and the environment.

S&ER Standard	Purpose
Biodiversity (NEM-SER-STA-008)	To set the minimum requirements for the management of biodiversity at Newmont owned, operated and/or managed operations and lands with the goal of ensuring a consistent approach to biodiversity conservation and sustainable stewardship of resources.
Social Baseline & Impact Assessment (NEM-SER-STA-017)	Sets the minimum requirements for collecting information to determine social baseline conditions, potential effects of Newmont's activities and to provide an informed analysis for the development and implementation of successful short and long-term mitigation and development plans. Newmont strives to improve our understanding of both the positive and negative impacts that our activities have on host communities, and to work with impacted communities and groups to mitigate or optimize these impacts in a strategic manner.
Stakeholder Relationship Management (NEM-SER-STA-016)	Sets the minimum requirements to adequately identify and effectively engage people and groups who have the potential to impact, or to be impacted by our business activities. Fulfilling these requirements should provide the means for Newmont to develop and maintain constructive, long-term stakeholder relationships based on trust and respect in order to maximize the shared value of Newmont's operations.
Community Investment and Development (NEM-SER-STA-019)	Sets the minimum requirements for planning, execution, monitoring and evaluation of development activities initiated or otherwise participated in by Newmont to ensure that these development activities equitably improve quality of life and align with the company's principles of transparency and shared value.
Land Acquisition & Involuntary Resettlement (NEM-SER-STA-018)	To set the minimum requirements for land acquisition and involuntary resettlement, before any site-related development or construction activity commences, to minimize risk to project development, start-up, and operations. The rights and needs of land owners and local communities related to land acquisition must be assessed and addressed prior to impact through interactions that foster trust and mutual respect.
Cultural Resource Management (NEM-SER-STA-021)	To set the minimum requirements for the identification, protection and management of cultural resources within Newmont's areas of influence so as to protect cultural resources and prevent unauthorized or undesired disturbance by Newmont employees and contractors.

As per the NTO IMS structure, environmental management plans (EMPs) are a key operational control for a defined risk or series of related risks. A plan includes details for addressing risks including but not limited to roles and responsibilities, objectives, targets, monitoring and review. NTO has a number of EMPs aligning with Environmental Management Standards and other primary areas of focus.

The following EMPs applicable to the NTO Exploration Mining Management Plan are utilised by NTO:

- Hazardous Materials Management Plan;
- Waste Management Plan;
- Water and Fluid Management Plan;
- Energy and Greenhouse Gas Management Plan;
- Air Quality Management Plan;
- Closure and Reclamation Plan;
- Biodiversity and Land Management Plan;
- Long-term Dingo Management Plan; and
- Weed Management Plan.

The various management plans will refer to a number of procedures which will detail how specific activities are carried out, e.g.

- Weed Monitoring Procedure; and
- Site Disturbance Procedure.

5.5 Environmental Audits & Inspections

5.5.1 Workplace Inspection

NTO ensures that workplace areas and activities are inspected on a regular basis confirming operational controls are maintained effectively and hazards are identified. These include cultural and environmental considerations as appropriate.

All inspections include visual field checks of the area and discussions with personnel as required. Observations and findings (hazards and corrective actions) identified in each location are documented on the appropriate part of the Inspection Checklist. Completed inspection records are forwarded to department managers and work area supervisors for feedback, prior to records and corrective actions being entered in to Cintellate.

Inspection Checklists relevant to the Officer Hill Exploration Project include:

- Various Exploration Checklists, such as Remote Camp Inspection, Drill Rig Inspection, Drill Program Checklist;
- Exploration related clearing (Drill pads and tracks);
- Housekeeping Checklist.

Workplace monitoring through environmental inspections occur on a variable frequencies relative to the purported work area/activity risk. Performance is assessed using a percentage-based weighted 'scoring' system, with compliance to a set checklist required. Performance is measured against discipline specific standards for air emission, water and drainage, land management, waste management, hazardous material management, energy and environmental awareness.

Inspections will be conducted during all future drilling programs to ensure that activities are completed consistent with approved Exploration Mining Management Plan. Additional inspections will be conducted following the completion of the drilling programs and disturbance rehabilitation to ensure that any earth works are completed to the required standard.

5.5.2 Internal & External Audit

NTO systematically and objectively verifies conformance with the IMS, legal and other requirements, to achieve Continuous Improvement in HS&S and S&ER Management Systems. The annually reviewed Tanami Audit Schedule generally comprises audits as detailed in Table 10.

Table 10 - NTO Audit Schedule

Audit Type	Audit Name	Audit Frequency
Internal	Discipline Specific Procedures	No less than every 3 years prioritised by risk
Internal	Newmont Australia IMS Procedures	No less than every 3 years prioritised by risk
Internal	Contractor Audits	Based on the level of risk
Denver Corporate	Environment Discipline Specific Standards Compliance Audits	Every three years
Denver Corporate	HS&S Discipline Specific Standards Compliance Audits	Every three years
Independent	High Risk Technical Issues	As directed
Independent	Regulatory Audits	As directed
Independent	CER Management System	As directed
External	IMS Pre Certification, Certification and Surveillance	As directed

Audit Type	Audit Name	Audit Frequency
External	Cyanide Code	Every 3 years
External	Airport Compliance	As directed by CASA

An electronic database system is used to track corrective actions and opportunities identified during audits with all completed audit reports saved into the intranet and document control system.

The NTO Management Team reviews and endorses actions, plans and commits resources to manage the close out of audit findings and drive continuous improvement. Results of completed audits are communicated at the Quarterly IMS Management Review Meetings as a standing agenda item.

5.6 Environmental Performance

NTO applies a consistent approach to monitoring and measurement programs, and assesses the effectiveness of controls which may have an impact on S&ER. Environmental performance reports are required to be submitted to the environmental department on a monthly basis by each work area with the accuracy independently assessed by the environmental department during the periodic work area inspections.

These reports are reviewed and the information collated to assess the overall performance of the site for a given period. Data contained in these reports is also collated as required to complete reports satisfying legislative requirements and voluntary commitments including the National Pollutant Inventory (NPI) and National Greenhouse and Energy Reporting (NGER) Scheme.

The exploration activities completed on Officer Hills were monitored by the lead Exploration Geologist for the program. The environmental performance of the exploration technicians working at Officer Hills was conformant with the organisations standards.

5.6.1 Monitoring and Measurement

Environmental monitoring activities are conducted in general accordance with the NTO Environmental Activity Schedule developed and utilised as a scheduling guidance tool for management of workload and resource allocation. Monitoring data is entered into one of two databases maintained by S&ER Advisors. These being:

- Cintellate –used for accidents/incidents, hazards, inspection, audits and corrective actions.
- Monitor Pro 5 – all monitoring data and frequency.

5.6.2 Continuous Improvement

In addition to completing Corrective and Preventative Actions, S&ER achieves continuous improvement through the use of Continuous Improvement Plans (CIP).

In the development of CIP the following factors are considered:

- Implementation of Newmont Australia Standards and NMC Discipline Specific Standards.
- Priority items identified through risk assessments.
- Legal requirements and other commitments.
- Contractor selection and management.
- Performance issues.

Identified improvement activities are ranked in order of importance (risk-based) and divided up amongst the department for championing and completion; each activity is integrated into the operation, using the NTO Change Management Process.

5.7 Emergency Procedures & Incident Reporting

5.7.1 Emergency Preparedness & Response

NTO has identified, planned, prepared for and is able to respond effectively to emergency situations with potential adverse effects to NTO Personnel, Operations and the Environment. The Emergency Management Plan ensures a systematic approach to managing such situations or events. Consideration has been given to geographic location of potential events, proximity to populated areas, concerned Stakeholders, available External Emergency Services, and Internal and External Communication Channels.

Detailed response plans are listed in the Emergency Management Plan, and are linked to the Newmont Rapid Response System. Rapid Response log actions and information as it becomes available during an emergency response. Rapid Response is able to notify different levels of management within Newmont Australia and Newmont Mining Corporation including the Regional Leadership Team and the Executive Leadership Team depending on the severity of the incident. Personnel who may be required to participate in the Rapid Response teams during emergency situations are required to undergo training in the use of Rapid Response and their role.

The Emergency Management Plan is reviewed annually as a minimum, or as required if significant changes to equipment or responsible personnel occurs. Local authorities are also engaged in the development of the Emergency Management Plan where appropriate. Detailed testing of the Emergency Management Plan to maximise Preparedness for Emergency Situations is conducted by the site Emergency Response Team.

5.7.2 Incident Reporting & Investigation

NTO ensure accurate and timely reporting and investigation of accidents and incidents to determine the underlying causes in order to reduce and, wherever possible, eliminate the potential of future failures, and to apply adequate control measures.

S&ER related incident reporting is conducted in accordance with the Accident and Incident Investigation Regional Procedure and Accident and Incident Reporting and Classification Regional Procedure.

The following steps are followed in response to an accident or incident:

- Initial Response;
- Notification & Recording;
- Assessment & Classification;
- Initial Reporting;
- Investigation & Actions;
- Final Reporting;
- Sign Off & Review; and
- Monitoring.

The involved employee(s) and their immediate supervisor record the event in Cintellate, the event management and record system. Cintellate classifies the event into investigation and/or reporting levels, from Level 1 to Level 5; notifications are then sent out to relevant parties via email.

In accordance with the requirements of s29 of the Northern Territory Mining Management Act, Serious Environmental Incidents (as defined under that Act) or incidents where serious environmental harm occur are reported to the Chief Executive Officer of the relevant government department as soon as practicable after becoming aware of the occurrence.

All accidents and incidents undergo an investigation process. The extent and depth of investigation shall be determined by the potential consequence that the accident or incident has been assigned. Investigations ensure that an appropriate sequence of events is identified, and that the Immediate and Basic / Root Causes of the accident or incident are identified. The site HS&S Department is responsible for management of hardcopy records associated with accident and incident investigations.

During the 2018 reporting period to date, 30 November 2018, there were no recorded environmental accidents or incidents of any severity associated with the TEP.

[redacted]

[redacted]

Table 11 - Officer Hill Exploration Project Security Estimate

8 PERFORMANCE OBJECTIVES

The sole performance objective of the Officer Hill Project is to find and grow confidence in gold resources and reserves with the view to extending the life of the Newmont Tanami Operations. This objective is completed through remote sensing surveys, and the documentation, sampling and analysis of surficial and sub-surface materials by hand, or mechanised drilling or trenching activities.

Critically, the Officer Hill Exploration Team aims to complete its objective without injury to its employees. Permitting, ongoing rehabilitation and auditing of surface and subsurface disturbances are also undertaken so as to ensure that exploration activities are completed with minimal impact to the environment.

The Officer Hill Project's environmental objectives include:

- Minimise the occurrence of environmental incidents and accidents;
- Ensure that all relevant employees and contractors are advised of the environmental and social responsibility objectives of the program and their environmental and social responsibility management responsibilities;
- Avoid sites of scientific, natural and Aboriginal or non-Aboriginal heritage significance;
- Restrict disturbance to vegetation and soils to the minimum necessary to achieve exploration objectives;
- When vegetation clearance or earthworks are unavoidable, minimise the amount of clearance and use practices which minimise erosion and interference with natural drainage;
- Store, use and dispose of all hazardous materials and waste materials in accordance with NTO requirements;
- Avoid and prevent the occurrence of hazardous material spills; with all spills to be reported and cleaned-up in a timely manner in accordance with NTO requirements;
- Minimise tracks and impacts caused by vehicular movements;
- Prevent the introduction and spread of noxious weeds by completing regular vehicle inspections prior to entering and leaving the relevant work areas; and
- Monitor the effectiveness of environmental management measures applied throughout the course of the exploration program and act promptly to remedy defects.

9 DEFINITIONS

Closure	The process followed when a mine operation has reached the stage in its life cycle where the intended mining use has been permanently concluded. Generally, includes broader issues than decommissioning activities, such as community consultation.
Contamination	Water, air or soil that has been impacted by microorganisms, chemicals, toxic substances, wastes, or wastewater in a concentration that makes the medium unfit for use or potential use.
Continual Improvement	Process of enhancing performance and management systems, not necessarily in all areas simultaneously.
Decommissioning	The process that begins near, or at, the cessation of mineral processing and ends with the removal of all unwanted infrastructure and services.
Environmental Management System (EMS)	Organisational structure, responsibilities, policies, practices, procedures, processes and resources for implementing and maintaining the Corporate Environmental Policy.
Objective	Overall goal, arising from a policy, that an organisation sets itself to achieve, and which is quantified where practicable.
Performance	Measurable results of the management system, related to an organisation's control of its aspects, based on its policy and objectives and targets.
Hazard	A source of potential harm or a situation with a potential to cause loss.
Hazardous Waste	Any waste containing significant quantities of a substance that may present danger to human health and the environment when released into the environment or is improperly managed. Possesses at least one of four characteristics (ignitability, corrosivity, reactivity, or toxicity), or listed by the US EPA as a hazardous waste.
Progressive Reclamation	Ongoing reclamation of land as it becomes available during the life of the mine. Progressive reclamation works are usually integrated with mine operations. Also known as progressive rehabilitation.
Rehabilitation	The return of disturbed land to a stable, self-sustaining condition and compatible with future land use objectives (i.e. reclamation and rehabilitation are one and the same, one is Americanised).
Newmont Tanami Operations	Mineral Leases – The Granites, Dead Bullock Soak, Windy Hill, Tanami Exploration Project and Officer Hill Project.

10 REFERENCES

Domahidy, G (1990) Hydrogeology of The Granites - Tanami Mining Region. Northern Territory: Power and Water Authority.

Gibson, D. F. (1986) *A Biological Survey of the Tanami Desert in the Northern Territory*. Conservation Commission of the Northern Territory, Alice Springs, N.T.

Huston D.L., Wygralak, A.S., Mernagh, T.P., Vandenberg, L.C., Crispe, A.J., Lambeck, L., Cross, A., Fraser, G.L., Williams, N.C., Worden, K., Meixner, A. 2007. Lode gold mineral system(s) of the Tanami Region, northern Australia. Mineralium Deposita, v. 42, p. 175 – 204.

Latz, P. K. (1995). 'Bushfires and Bushtucker: Aboriginal Plant Use in Central Australia.' IAD Press: Alice Springs, NT.

Laut, P., Margules, C. and Nix, H.A. (1975) Australian *Biophysical Regions. A Preliminary Regionalisation.* CSIRO and Dept. Of Urban & Regional Development, Canberra.

Low, W.A., Cook, B.D. and Strong, B.W. (1983) *Reproduction and population dynamics of the rabbit, Oryctolagus cuniculus, in the Northern Territory at the edge of its distribution in Australia. Report to CCNT*.

Low, W.A., Foster, E. and Kanter, M. (1990) *Flora and Vertebrate Fauna Survey of the Proposed Mineral Lease at Dead Bullock Soak and along the Haulage Road to the Granites, Tanami Desert*.

Morton, S.R., Short, J. and Barker, R.D. (2004) Refugia for Biological Diversity in Arid and Semi-arid Australia, Biodiversity Series Paper No. 4, Department of Environment and Heritage.

Mt King Ecological Surveys (1985) The Biological Environment of the Granites Goldfield. Report prepared for North Flinders Mine Limited.

Nathan, R.J and Weinmann, P. (Eds). "Australian Rainfall and Runoff", 1998. IE Aust.(pub).

Northcote, K. H. and Wright, M. J. (1983) Soils: an Australian viewpoint / sponsored by the Division of Soils, Commonwealth Scientific and Industrial Research Organization, Australia.

Northcote, K.H. 1975. Atlas of Australian soils. CSIRO, Melbourne.

Northcote, K.H. (1975) *Soils, 3rd Edition, Atlas of Australian Resources*. Govt. Printer, Canberra.

Thackway, R. and Cresswell I. D. (ed) (1995) *An Interim Biogeographic Regionalisation for Australia.* Australian Nature Conservation Agency, Reserve System Unit, Canberra.

11 DOCUMENT CONTROL

Rev.	Author	Reviewer	Approved By	Issue Date
1	S DODD M BAGGOTT	N GOODWIN W GILCHRIST	F HARDY	2016
2	S. DODD A. HAWKINS	S. McCANN G. SALE	R. GOLIJANIN	2018
3	A. HAWKINS	S. McCANN G. SALE	R. GOLIJANIN	2018
4	C. TURYN A. HAWKINS	S. McCANN G. SALE	R. GOLIJANIN	2019

12 APPENDICES

Appendix A – Officer Hill Desktop Biodiversity Assessment

Appendix B – HS&S and S&ER Policies

Appendix C – Newmont Australia Integrated Management System Manual

Appendix D – Tanami Region Conservation Areas

Appendix E – EL 23150 Conservation Areas

Appendix A – Officer Hill Desktop Biodiversity Assessment

FLORA AND FAUNA ASSESSMENT

OFFICER HILL PROJECT AREAS

Tenement EL23150, Tanami Desert NT

Report prepared for Newmont Tanami Pty Ltd

February 2017

Report prepared by:

Low Ecological Services

P/L PO Box 3130, Alice Springs NT

0870 Ph: : (08) 89 555 222

Fax: (08) 89 555 722

Email: lowecol@lowecol.com.au
Web: www.lowecol.com.au

DOCUMENT CONTROL

FRONTISPIECE: Images 1-4: Sandplain in the Tanami Desert region

DISCLAIMER

This document has been prepared by Low Ecological Services (LES) for Newmont Tanami Pty Ltd in accordance with an agreement with Newmont Tanami Pty Ltd. LES has prepared this document using the skill and care expected from professional scientists to provide factual and technical information and reasonable solutions to identified risks. It does not constitute legal advice.

DOCUMENT DETAILS

Document Number:	
Name of Document:	Officer Hill project areas flora and fauna assessment
Authors:	Claire Treilibs, Jess Cuneo, Bill Low
Client:	Newmont Tanami Pty Ltd
Name of Project:	Officer Hill project areas

DOCUMENT CONTROL

Approvals	**Name**	**Signature**	**Date**
Originator:	Low Ecological Services P/L		
Reviewer:		×	
Administrator:		×	
Approver:	Department of Primary Industry and Resources	×	
Custodian:		×	

REVISION DETAILS

Date	Revision	Details	Name	Company
22/2/17	Draft v1	Prepared by	Claire Treilibs, Jess Cuneo	Low Ecological Services P/L
23/2/17	Draft v1.4	Reviewed by	Bill Low	Low Ecological Services P/L
21/3/17	Draft v1.5	Revised	Jess Cuneo	Low Ecological Services P/L
23/3/17	Draftv1.5	Reviewed by	Katie Degnian	Low Ecological Services P/L
27/3/17	Draftv1.5	Reviewed by	Bill Low	Low Ecological Services P/L
30/3/17	Final	Submitted to	Nathan Goodwin	Newmont Tanami Pty Ltd
31/03/17		Reviewed by	Nathan Goodwin	Newmont Tanami Pty Ltd
03/04/17		Revised	Jess Cuneo	Low Ecological Services P/L
03/04/17		Submitted to	Nathan Goodwin	Newmont Tanami Pty Ltd

PREFACE

All information on proposed operations contained in this document has been supplied by Newmont Pty Ltd.

1 EXECUTIVE SUMMARY

Newmont Tanami Pty Ltd propose to undertake exploration drilling in two prospect areas within tenement EL 23150: Officer Hill 1 and Officer Hill 2.

The Department of Primary Industry and Resources (DPIR) requested that Newmont Tanami Pty Ltd undertake a flora and fauna desktop assessment of the Officer Hill prospect areas (referred to as 'the Project') prior to undertaking works. Newmont Tanami Pty Ltd contracted Low Ecological Services (LES) to carry out this assessment.

LES undertook a desktop assessment of the Project area within tenement EL23150 and surrounding region to characterise the environment, identify flora and fauna species of conservation concern and identify habitats of significance. An EPBC Protected Matters Search (PMST) and interrogation of the NT Flora and Fauna Atlases were undertaken within a 20 km area around the leases. These identified threatened species and other species of conservation concern as well as weeds and feral animal species that occurred or have the potential to occur in the survey area.

The desktop assessment identified ten threatened fauna species having a moderate to high likelihood of occurring in the project areas based on search tool results and existing habitat areas. Of these five were assessed as being susceptible to development activities due to behaviour, including the greater bilby (*Macrotis lagotis*), great desert skink (*Liopholis kintorei*), brush-tailed mulgara (*Dayscercus blythi*), southern marsupial mole (*Notoryctes typhlops*) and woma python (*Aspidites ramsayi*)

Three near threatened and eight data deficient flora species listed under the *Territory Parks and Wildlife Conservation Act* (TPWC Act) were identified as potentially occurring within 20 km of the project areas (NT Flora Atlas).

When assessed against the Matters of National Significance Significant Impact Guidelines 1.1 (Department of Environment, 2013) LES have concluded that the proposed development activities in the Officer Hill Project Area are unlikely to have a significant impact on the widespread populations of any threatened species in the region.

2 TABLE OF CONTENTS

List of Tables

Table of Figures

1 INTRODUCTION

1.1 Overview

Low Ecological Services Pty Ltd (LES) were requested by Newmont Tanami Pty Ltd to assess and interpret the flora and fauna data at the Officer Hill project areas ('the Project') and to identify measures to reduce any impact on threatened species in targeted project areas. The following report identifies threatened species that may be vulnerable to the Project, assesses the level of risk to the species and provides management techniques to reduce the risk of disturbance.

1.2 Scope

The objectives for the assessment of flora and fauna in the Officer Hill project area were to:

- Identify and describe relevant existing flora and fauna within the focus areas for development that may be affected by disturbance
- Interpret local data in a regional context through access to current spatial environmental datasets
- Identify potential environmental impacts of the Project on identified environmental values, including habitat areas and assess the associated level of risk
- Describe threatened species that may be impacted by the Project.

1.3 Legislative context

1.3.1 Commonwealth legislation

Environment Protection and Biodiversity Conservation Act 1999

The Environmental Protection and Biodiversity Conservation Act (EPBC Act) is the Australian Government's key piece of environmental legislation, which commenced on July 16, 2000. The objects of the EPBC Act are to provide for the protection of matters of national environmental significance (MNES) and to promote the conservation of biodiversity. The EPBC Act focuses Australian Government interests on the protection of MNES, with the states and territories having responsibility for matters of state and local significance. The EPBC Act identifies MNES as:

- World heritage properties.
- National heritage places.
- Wetlands of international importance (Ramsar wetlands).
- Threatened species and ecological communities;
- Migratory species.
- Commonwealth marine areas.
- Great Barrier Reef Marine Park.
- Nuclear actions (including uranium mining).

A water resource, in relation to coal seam gas development and large coal mining development.

1.3.2 State legislation

Northern Territory Parks and Wildlife Conservation Act 2000

The Northern Territory (NT) *Parks and Wildlife Conservation Act 2000* (TPWC Act) is 'an Act to make provision for and in relation to the establishment of Territory Parks and other Parks and Reserves, and the study, protection, conservation and sustainable utilisation of wildlife'. Under the TPWC Act, all threatened species are classed as protected wildlife. The Act includes 'Principles of Management', which require that a threatened species be managed in a manner that 'maintains or increases their population or the extent of their distribution at or to a sustainable level'.

Environmental Assessment Act 1982 and Environmental Assessment Administrative Procedures 1984

The Environmental Assessment Act EA Act and the Environmental Assessment Administrative Procedures 1984 is administered by the NT Environmental Protection Agency.The EA Act provides a framework for the assessment of potential environmental impacts of developments. The object of the EA Act is to ensure that matters affecting the environment to a significant extent are fully examined and taken into account in decisions by the NT Government. The assessment process also evaluates the effectiveness of the proposed safeguards to mitigate these impacts during construction and operational phases of the development.

Mining Management Act 2001

The *Mining Management Act 2001* (MM Act) is administered by the Department of Mines and Energy (DME). The objectives of the MM Act are to ensure that mining in the NT is conducted in accordance with best practice standards for health, safety and the environment. Under the MM Act, an application for authorisation to carry out mining activities must include a Mining Management Plan (MMP).

Weeds Management Act 2001

The *Weeds Management Act 2001* (WM Act) is administered by the NT Department of Environment and Natural Resources(DENR). The objective of the WM Act is to prevent the spread of weeds in, into and out of the NT and to ensure that the management of weeds is an integral component of land management in accordance with any other strategy adopted to control weeds in the NT.

1.3.3 Other legislation

Other legislation that may be applicable to the proposed drilling includes:

General:

- Mineral Titles Act 2016.
- Northern Territory Environmental Protection Authority Act 2012.

Land Use:

- Planning Act 2016.
- Aboriginal Land Act 2013.
- Crown Lands Act 2014.
- Soil Conservation and Land Utilization Act 2016.
- Bushfires Act 2014.
- Pastoral Land Act 2016.

Cultural and Heritage:

- Northern Territory Aboriginal Sacred Sites Act 2013.
- Heritage Act 2016.

Water Quality and Biodiversity Conservation:

- Water Act 2016.
- Biological Control Act 2016.
- Public and Environmental Health Act 2016.

Air Quality, Noise and Waste Management:

- Waste Management and Pollution Control Act 2016.
- Public and Environmental Health Act 2016.

Safety and Environmental Compliance:

- Work Health and Safety (National Uniform Legislation) Act 2016.
- Environmental Offences and Penalties Act 2011.
- Transport of Dangerous Goods by Road and Rail (National Uniform Legislation) Act 2016.
- Dangerous Goods Act 2012.

2 METHODOLOGY

2.1 Desktop review

Literature and database searches were undertaken to gain an understanding of the ecological context of the lease areas. Data collated from database searches provided information on the fauna and flora species known to occur in the region, particularly those of conservation significance. GIS mapping and a search of Australian Bureau of Meteorology (BoM) climate data were undertaken to provide an overview of the climate, soils, vegetation and habitats of the lease areas and surrounds. A literature review was performed to obtain an understanding of data available and validity thereof, within and surrounding the project areas.

2.1.1 Database review

A database review was undertaken using several data sources to provide an ecological context of the landscape, vegetation, habitats and climate of the lease areas. The sources include:

- Climate data online (Bureau of Meteorology, 2017).
- Interim Biogeographic Regionalisation of Australia (IBRA) (Thackway & Cresswell, 1995).
- Land Systems of the Alice Springs area, Northern Territory, Australia (Perry, et al., 1960).
- Digital Atlas of Australian Soils (Northcote, 1968).
- NTVIS - NT Data Compilation for the National Vegetation Information System to determine vegetation communities present in the lease areas.
- Vegetation Survey of the Northern Territory Australia: Notes to accompany 1: 100, 000 Map Sheets (Wilson, et al., 1990).
- Aerial photographs and satellite imagery.

Database searches provided lists of species of conservation significance that occur or are likely to occur within the vicinity of the survey areas. Species of conservation significance are those that are listed as such under the EPBC Act and/or TPWC Act.

The Commonwealth Government Department of the Environment and Energy (DoEE) Protected Matters Search Tool (PMST) identifies MNES that may occur in a given area. The PMST is based on predicted distributions of EPBC listed flora and fauna species and communities and/or their habitat, rather than known records. The PMST may predict the occurrence of a species or community in an area when there are no documented records from the area. A PMST search was conducted within a 20 km radius around the project areas (Appendix 1).

The NT Species Atlas which is maintained by the DENR and includes the NT Fauna Atlas, NT Flora Atlas, Sites of Conservation Significance (SoCS) and Sites of Botanical Significance (SoBS). The NT Fauna and Flora Atlas search provided a list of records of threatened, non-threatened and introduced fauna and flora species within a 20 km radius around the survey areas. A search of Sites of Conservation Significance (SoCS) and Sites of Botanical Significance (SoBS) was also undertaken to determine any SoCS or SoBS in the vicinity of the project areas.

Geology, soil, land unit and vegetation mapping were studied to identify habitats present within the survey areas. This was then cross-referenced with information on threatened species habitat requirements obtained from the published literature and habitats in which mapped records occur, to determine if threatened species habitat is present or likely to be present. Each threatened species identified was subsequently ranked on likelihood of occurrence in the project areas (low, moderate or high).

2.1.2 Literature review

A literature review provided information on the species occurring or potentially occurring within the lease areas and surrounds. Information was collated to assess the potential for species of conservation significance to occur within the lease areas and surrounds, and the likelihood that proposed operations would impact on these species of conservation significance. Sources of literature reviewed include:

- Species Profile and Threats Database (Environment, 2017) for information about species listed in the EPBC Act – Information sheets, survey guidelines, recovery plans, and Threat Abatement Plans for Key Threatening Processes;
- NT Threatened Species fact sheets published by the Department of Environment and Natural Resources (DENR); and
- Scientific literature (various referenced sources).

3 EXISTING ENVIRONMENT

3.1 Climate

The Tanami region is semi-arid with a monsoonal influence. The closest weather station to the Officer Hill project areas, with consistent and current temperature data, is Rabbit Flat (Bureau of Meteorology station 015666). Annual rainfall at Rabbit Flat is 483.7 mm, with a summer bias from November to March (Bureau of Meteorology, 2017). Mean minimum temperature at Rabbit Flat ranges from 6.8°C in July to 24.0°C in January (Bureau of Meteorology, 2017). Mean maximum temperatures range from 25.7°C in June to 38.5°C in January (Bureau of Meteorology, 2017).

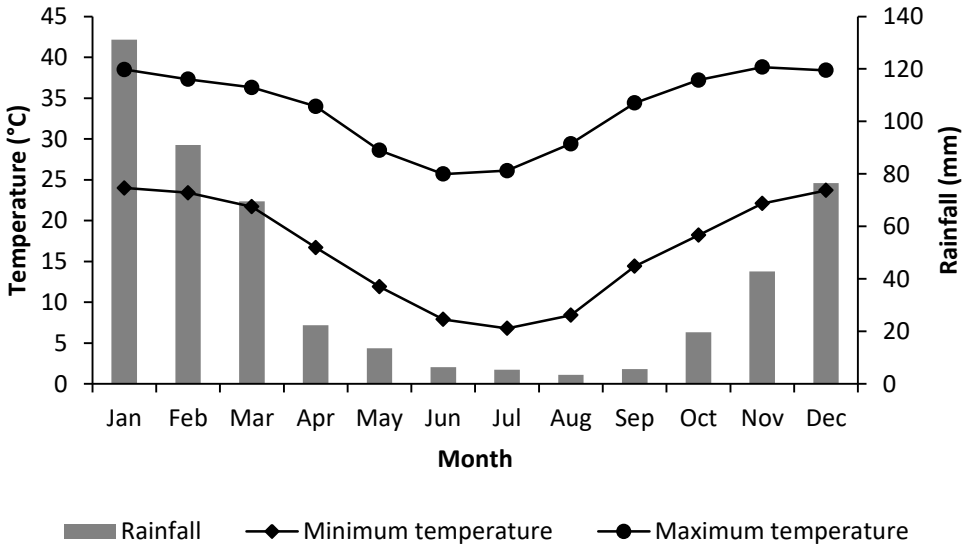


Figure 1: Monthly average rainfall and average minimum and maximum temperature at Rabbit Flat (Station 015666) [data 1996–2016] (Bureau of Meteorology, 2017).

3.2 Bioregion

The Interim Biogeographic Regionalisation of Australia (IBRA) is a classification system of geographically distinct bioregions based on common climate, geology, landform, native vegetation and species information (Department of Sustainability, Environment, Water, Population and Communities, 2012a). The Officer Hill project areas lie within the Tanami Desert subregion of the Tanami bioregion (Figure 2).

The Tanami bioregion is characterised by a complex mosaic of landforms and habitat and encompasses much of the extensive central Tanami Desert palaeodrainage system. Other habitats within the bioregion include alluvial plains, dunefields, sandplains, rocky hills and rises, freshwater and saline lakes, and claypans (Thackway & Cresswell, 1995). The diversity of habitats contributes to a rich flora and fauna diversity and the persistence of many threatened species. Vegetation is varied and includes *Triodia sp.* hummock grasslands with *Acacia* tall sparse-shrubland overstorey between dunes; snappy gum *Eucalyptus brevifolia* low open-woodland with soft spinifex understorey and *Eragrostis xerophila* open grassland with scattered trees and shrubs (White et al. 2000). Vegetation of wetland areas includes coolabah and bluebush at swamps and bare pans of ephemeral lakes containing *Ruppia* sp. fringed by *Melaleuca glomerata* or samphire and *Acacia maconochiena* fringing bare pans (Duguid A., 2005)). Land tenure is primarily Aboriginal freehold, with 78.9% of the bioregion tenure held by five Aboriginal land trusts. The remaining tenures are held by pastoral leases (18.0%) and crown leases or vacant land (3.1%) ((Baker, et al., 2005) The main land uses within the Site are Indigenous use, pastoral operations and mining.

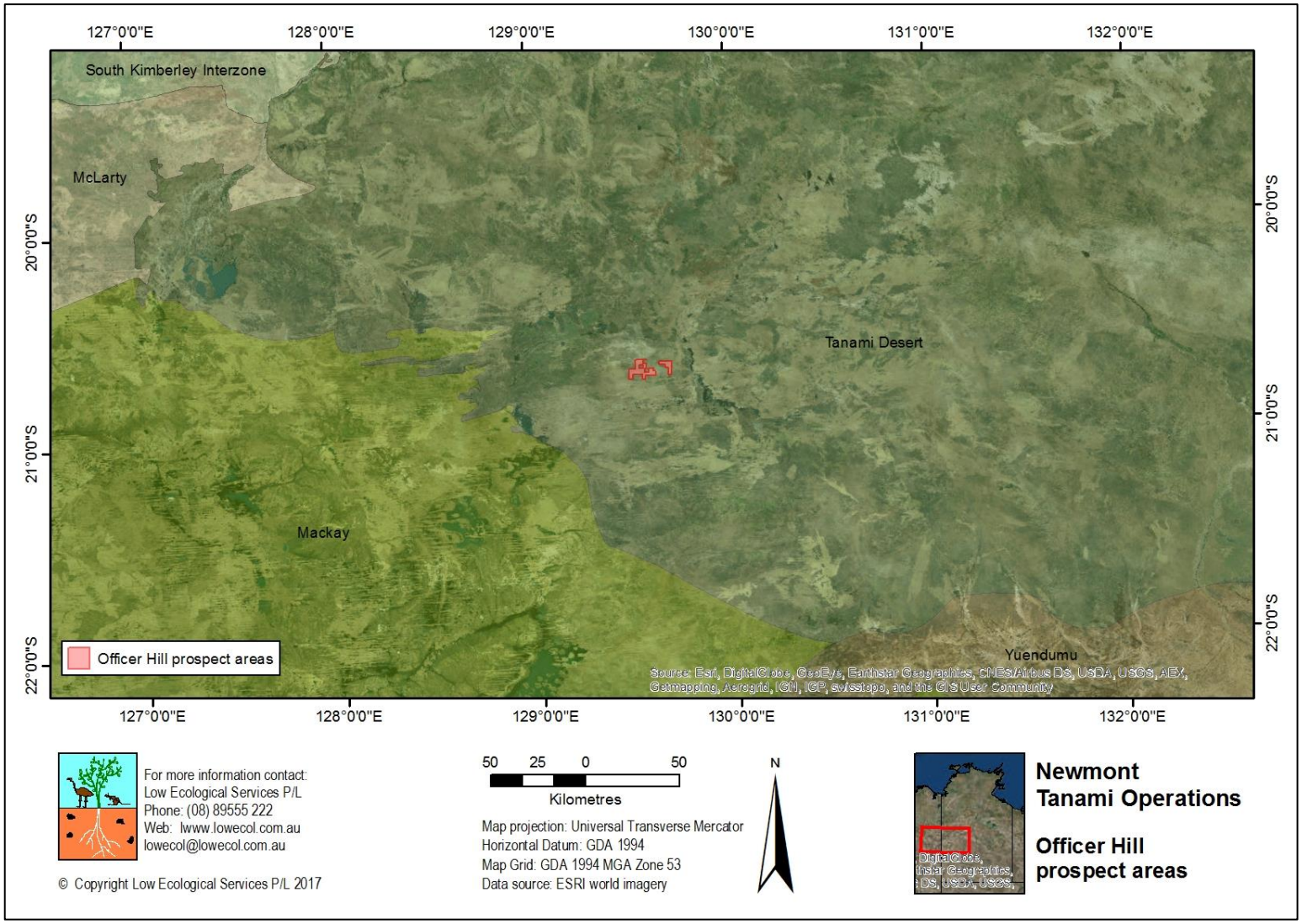


Figure 2: IBRA bioregions in relation to the Officer Hill project areas (Department of Sustainability, Environment, Water, Population and Communities, 2012a).

3.3 Geology

The geological units of the Officer Hill project areas are described in Table 1 and mapped in Figure 3. Officer Hill 1 consists of geological units P, N4 and g5. Officer Hill 2 comprises geological units N4 and N5>1.

Table 1: Geological units present within the Officer Hill project areas as described by Ahmad (2000)

Map unit	Rock type	Description
P	Sedimentary	Sandstone, limestone, shale, coal, diamictite
N4	Sedimentary	Banded iron formation (BIF), carbonaceous shale, mudstone, chert, amphibolite, schist, calc-silicate, dolerite
g5	Igneous	Granite
N5>1	Sedimentary	Greywacke, siltstone, shale

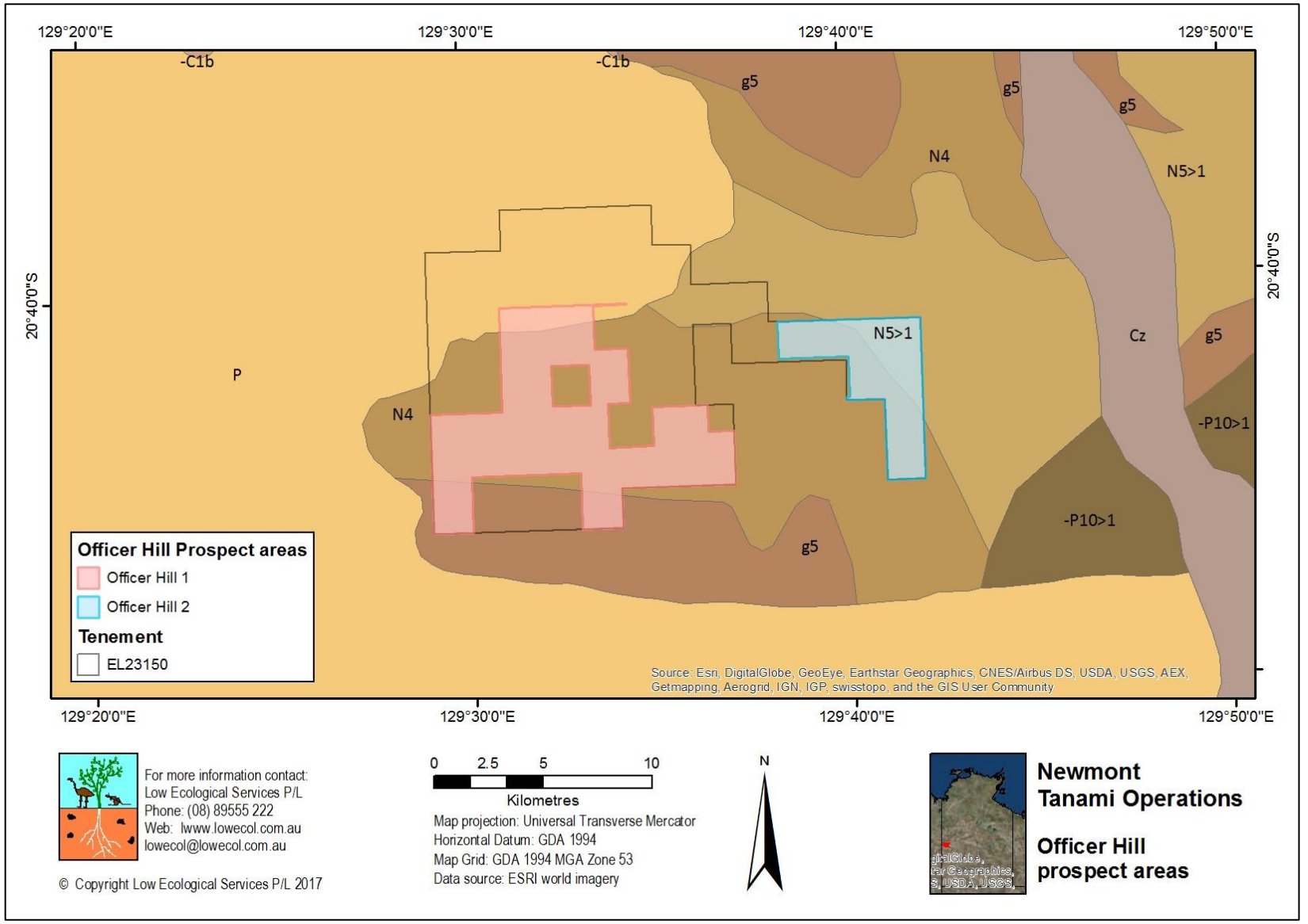


Figure 3: The Geological Map of the NT ((Ahmad, 2000)) within and surrounding the the Project. Geological units within these two areas are described in Table 1.

3.4 Soils

Soil types in the project areas have been mapped using the Atlas of Australian Soils (mapped by Bureau of Rural Sciences after Commonwealth Scientific and Industrial Research Organisation, 1991; described by (Northcote, 1968)). However, because the currently accepted classification system is the Australian Soil Classification (ASC) (Isbell & National Committee on Soil and Terrain, 2016) a conversion from the Atlas of Australian Soils to Australian Soil Classification was developed by (Ashton & McKenzie, 2001). Soil units within Officer Hill project area include AB29 and BA5. The soil units are described along with the ASC conversion in Table 2 and mapped in relation to the project area and immediate surrounds in Figure 4.

Table 2: Description of soil types within the project Area, including Australian Soils Atlas Description by Northcote (1968) and Australian Soil Classification conversion by Ashton & McKenzie (2001)

Map unit	Australian Soils Atlas Description	ASC Conversion
AB29	Gently undulating plains: chief soils are red earthy sands with some yellow earthy sands on gently sloping plains and some siliceous sands in flood plain areas. Other soil occurrences include small areas of shallow ironstone-gravelly sands on low gravelly rises and very small areas of non-calcareous massive earth on broad shallow drainage floors.	**Tenosol:** Soils with generally only weak pedologic organisation apart from the A horizons. Encompasses a diverse range of soils that do not fit the requirements of any other soil orders and generally with one or more of the following: i. A peaty horizon. ii. A lumose, melacic or melanic horizon, or conspicuously bleached A2 horizon, which overlays a calcrete pan, hard unweathered rock or other hard materials; or partially weathered or decomposed rock or saprolite or unconsolidated mineral materials. iii. A horizons which meet all the conditions for a peaty, humose, melacic or melanic horizon except the depth requirement, and directly overlie a calcrete pan, hard unweathered rock or other hard materials; or partially weathered or decomposed rock or saprolite, or unconsolidated mineral materials. iv. A1 horizons which have a more than weak development of structure and directly overlie a calcrete pan, hard unweathered rock or other hard materials; or partially weathered or decomposed rock or saprolite, or unconsolidated mineral materials. v. An A2 horizon which overlies a calcrete pan, hard unweathered rock or other hard materials; or partially weathered or decomposed rock or saprolite, or unconsolidated mineral materials. vi. Either a tenic B horizon, or a B2 horizon with 15% clay (SL) or less, or a transitional horizon (C/B) occurring in fissures in the parent rock or saprolite which contains between 10 and 50% of B horizon material (including pedogenic carbonate). vii. A ferric or bauxitic horizon >0.2 m thick. viii. A calcareous horizon >0.2 m thick.
AB53	Dune fields – gently undulating plains with linear dunes. There are areas of calcrete of	**Tenosol:** Soils with generally only weak pedologic organisation apart from the A horizons. Encompasses a diverse range of soils that do not

Map unit	Australian Soils Atlas Description	ASC Conversion
	cariable extent, pans, lakes, depressions and springs; and some isolated hilly residuals: chief soils are red earthy sands on the dune slopes and between the dunes and red siliceous sands on the dune crests and upper slopes. Other soils include grey-brown calcareous earth, sometimes covered with an ironstone scree in the interdune plains, some shallow powdery calcareous loams and possibly calcareous earth on the calcrete.	fit the requirements of any other soil orders and generally with one or more of the following: viii. A peaty horizon. ix. A lumose, melacic or melanic horizon, or conspicuously bleached A2 horizon, which overlays a calcrete pan, hard unweathered rock or other hard materials; or partially weathered or decomposed rock or saprolite or unconsolidated mineral materials. x. A horizons which meet all the conditions for a peaty, humose, melacic or melanic horizon except the depth requirement, and directly overlie a calcrete pan, hard unweathered rock or other hard materials; or partially weathered or decomposed rock or saprolite, or unconsolidated mineral materials. xi. A1 horizons which have a more than weak development of structure and directly overlie a calcrete pan, hard unweathered rock or other hard materials; or partially weathered or decomposed rock or saprolite, or unconsolidated mineral materials. xii. An A2 horizon which overlies a calcrete pan, hard unweathered rock or other hard materials; or partially weathered or decomposed rock or saprolite, or unconsolidated mineral materials. xiii. Either a tenic B horizon, or a B2 horizon with 15% clay (SL) or less, or a transitional horizon (C/B) occurring in fissures in the parent rock or saprolite which contains between 10 and 50% of B horizon material (including pedogenic carbonate). xiv. A ferric or bauxitic horizon >0.2 m thick. viii. A calcareous horizon >0.2 m thick.
BA5	Stony hills and ranges largely derived from sandstones and having flanking sand plains: chief soils are pockets of shallow stony sands and sandy loams and among the sandstone outcrops. Associated are small areas of red earthy sands on the gently sloping plains and valley floors. Other soils including non-calcareous massive earth on valley floors.	**Rudosol:** Soils with negligible (rudimentary) pedological organisation apart from the minimal development of an A1 horizon or the presence of less than 10% B horizon material in fissures in the parent rock or saprolite. The soils are apedal or only weakly structured in the A1 horizon and show no pedological colour change apart from darkening of an A1 horizon. There is little or no texture or colour change with depth unless stratified or buried soils are present. Cemented pans may be present as a substrate material.
SV10	Shallow valleys with lakes, clay pans, salt pans, calcrete platforms, sand dunes, kopi dunes and calcareous dunes: chief soils are probably shallow loams. Associated are shallow powdery calcareous loams and calcareous earth on the calcrete platforms with some low gilgai on flanking saline plains and loose brownish sands on the dunes.	**Hydrosol**: Other soils that are saturated in the major part of the solum for at least 2-3 months in most years. The order is designed to accommodate a range of seasonally or permanently wet soils. The soils may or may not experience reducing conditions for all or part of the period of saturation and thus manifestations of reduction and oxidation such as 'gley' colours and ochrous mottles may or may not be present.

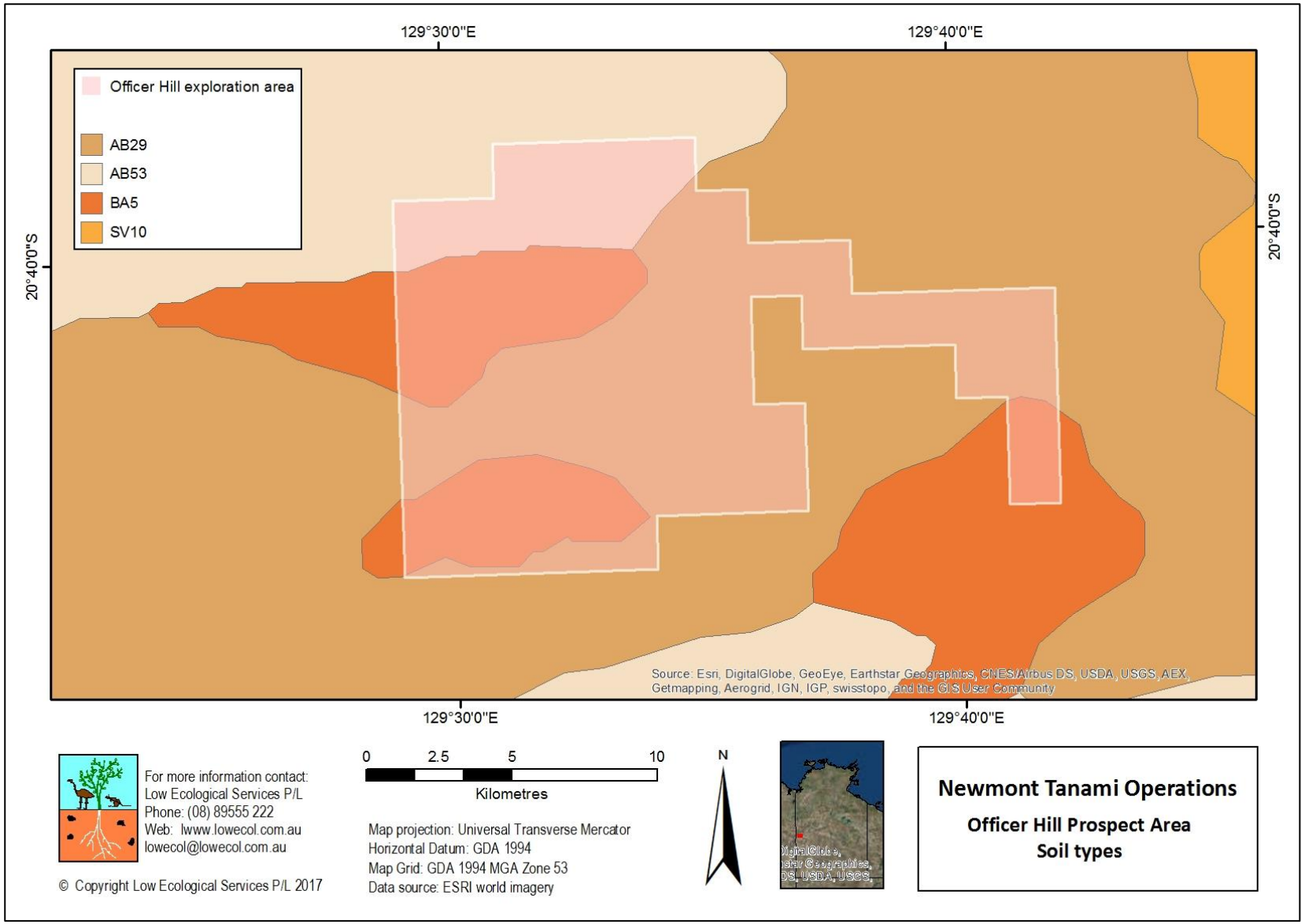


Figure 4: Soil types mapped in the Atlas of Australian Soils (Bureau of Rural Sciences, 1991) in the Officer Hill region. Soil types within the three areas are described in Table 2.

3.5 Land units

Land units have long been used as classification units (Perry et al. 1962) and are suggested as effectively representing patterns of different biological assemblages across the landscape (Oliver, et al., 2004). Land units were therefore considered the appropriate level at which to commence stratification of the landscape for the Tanami area. Existing land system mapping for the NT does not cover the area of interest within the Tanami although some work has been done in isolated areas. These include (Domahidy, 1990) who characterised land units for his study of paleodrainage channels in the central Tanami and (Low, et al., 1994) who provided more detail for the area around Tanami Well.

An alternative mapping system which was based on regolith (soil mantle of material that overlies bedrock) mapping derived from air photos and undertaken for Newmont Pty Ltd (Wilford & Butrovski, 1999) became available in 2000. A total of 49 regolith units covered the full mapping area which extended roughly from Sangster's Bore in the south to approximately 140 km north of Tanami Mine, approximately 100 km east of Sangster's Bore and west into Western Australia (WA). Low et al. (2001) showed these regolith units could be re-interpreted in a systematic way to provide meaningful inferred land units or land systems. Following the procedure employed by (Holmes & Low, 2000) whereby regoliths with similar geology, soils and landform were grouped into inferred similar land units resulting in the formation of seven land units over the study area (Table 3). This was extended spatially using standard GIS procedures (Figure 5). Using regolith to assign land units has the advantage that it is not affected by fire that can complicate classifications based on vegetation.

Table 3: Description of land units within the Officer Hill region as described by Fett & Hall (1983).

Land Unit	Code	Regolith Heading	Land form	Land form description
Palaeo-channel	P	Transported regolith	Depositional plain	Alluvial, colluvial and lacustrine sediments consisting of sand, silt and clay of varying thickness forming extensive low relief depositional plains and playa lakes. Alluvium mainly covered by sheetflow and Aeolian ferruginous fine to medium quartzose sand. Calcrete common.
Elevated Drainage Depression	EED	Insitu regolith	Depositional plain	Sheetflow and minor alluvial deposits consisting of ferruginous fine to coarse quartzose sand and sandy clay. Aeolian sands reworked by sheetflow processes. Quartz, lithic, ferruginous gravel/granular lags. Residual quartzose sand. Micaceous sand locally common.
Shallow Sandplain	SSP	Transported regolith	Pediment	Colluvial fan and sheetflow deposits consisting of medium to fine ferruginous quartzose sand, minor ferruginous lithic fragments, quartz and iron (Fe) nodules. Forms low angle colluvial fans and pediments.
Loamy Sandplain	LmSP	Insitu/Transported regolith	Depositional plain	Sheetflow and local alluvial deposits consisting of ferruginous fine to coarse quartzose sand and minor gravel. Local dunes and sand spreads. Aeolian sands reworked by sheetflow processes. Colluvial and alluvial sands of varying thickness. Local patchy quartz, lithic and Fe nodule/granulelags.
Lateritic Sandplain	LtSP	Insitu regolith	Depositional plain	Sheetflow deposits consisting of Fe nodules and granules over medium to fine ferrugionous quartzose sand. Reworked Aeolian sand and local alluvial sediments. Residual sands and clay. Highly weathered ferruginous saprolite or Fe duricrust likely to be within 2m of the surface. Lags consist of Fe nodules and granules and minor quartz.
Chert Rise	CR	Insitu regolith	Rises	Saprolite partly covered by gravel lags, residual clays and ferruginous sands. Minor alluvial sediments. Lags consist of lithic fragments, Fe gravel and quartz. In places mottled and bleached saprolite exposed at surface. Soils and colluvium likely to be locally derived.
Lateritic Rise	LR	Insitu regolith	Depositional plain	Thin cover of sheet flow ferruginous sand, Fe nodules and gravel over Fe duricrust or saprolite. Saprolite typically highly ferruginous and mottled at depth. In places lithic fragments and Fe nodules are cemented to form Fe duricrust. Ferruginous lithic and lags. Minor quartz lag.

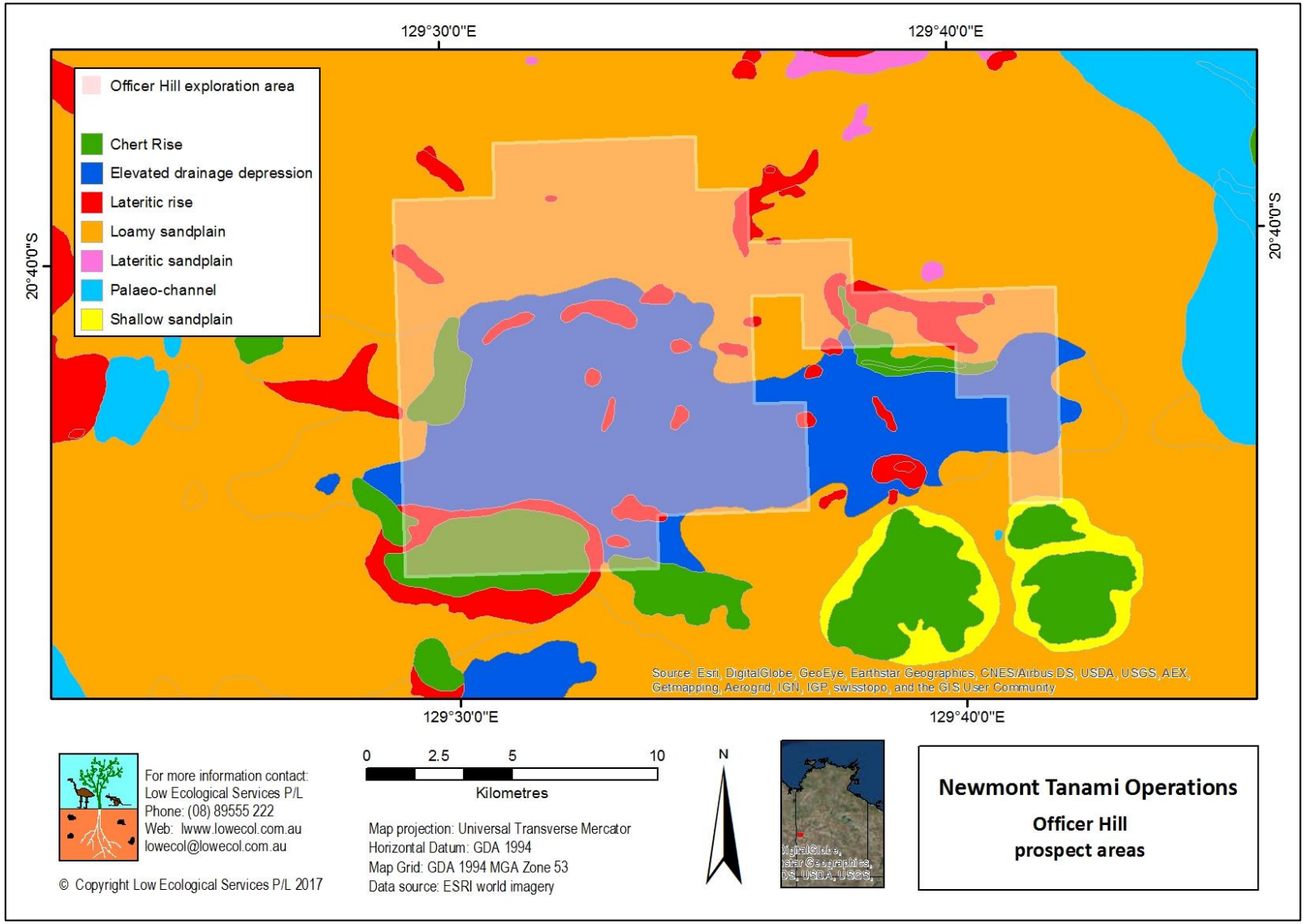


Figure 5: Land unit mapping for the Officer Hill project areas (Wilford & Butrovski, 1999). Descriptions of each land system are provided in Table 3.

3.6 Vegetation types

Vegetation types around the project areas have been mapped at a scale of 1: 100, 000 in the Vegetation Survey of the Northern Territory (Wilson, et al., 1990). This initial mapping was revised in 2007 and compiled into the National Vegetation Information System (NVIS), version 3.1. Vegetation map units of the Officer Hill region are shown in Figure 6 and described in Table 4. Only one vegetation NVIS map unit (76) is mapped over the project areas: a low open hummock grassland occurring on red siliceous sandy soils (Table 4).

Table 4: Description of vegetation types around the Officer Hill project areas, as mapped by Wilson et al. (1990) and revised in the NVIS 2007. Note, only vegetation map unit 32000076 occurs within the project areas.

Vegetation map unit NVIS (Wilson *et al* 1990)	Broad vegetation classification	Structural formation	Environmental description	Vegetation strata
76	Low isolated *Eucalyptus* trees and tall sparse *Acacia* shrubland over *Triodia* low open hummock grassland	Open hummock grassland	Red siliceous sandy soils	Upper stratum: *Eucalyptus pruinosa, Corymbia opaca* Mid stratum: *Acacia stipuligera, Grevillea wickhamii* Ground stratum: *Triodia pungens, Triodia schinzii*
86	*Triodia* mid hummock grassland	Hummock grassland	Sand dunes	Ground stratum: *Triodia pungens*
100	*Acacia* low open woodland over *Eragrostis* low open tussock grassland	Open tussock grassland	Heavy clay plans	Mid stratum: *Acacia victoriae, Eucalyptus microtheca, Carissa spinarum* Ground stratum: *Eragrostis xerophila, E. falcata, E. eriopoda*
111	*Melaleuca* low open woodland over *Salsola* low open chenopod shrubland	Open shrubland	Fringing salt pans throughout sandplain/dune areas (part of remnant drainage systems), shallow loams or saline clays	Upper stratum*: Melaleuca glomerata, Eucalyptus microtheca* Ground stratum*: Salsola kali, Tecticornia indica, Maireana luehmannii*

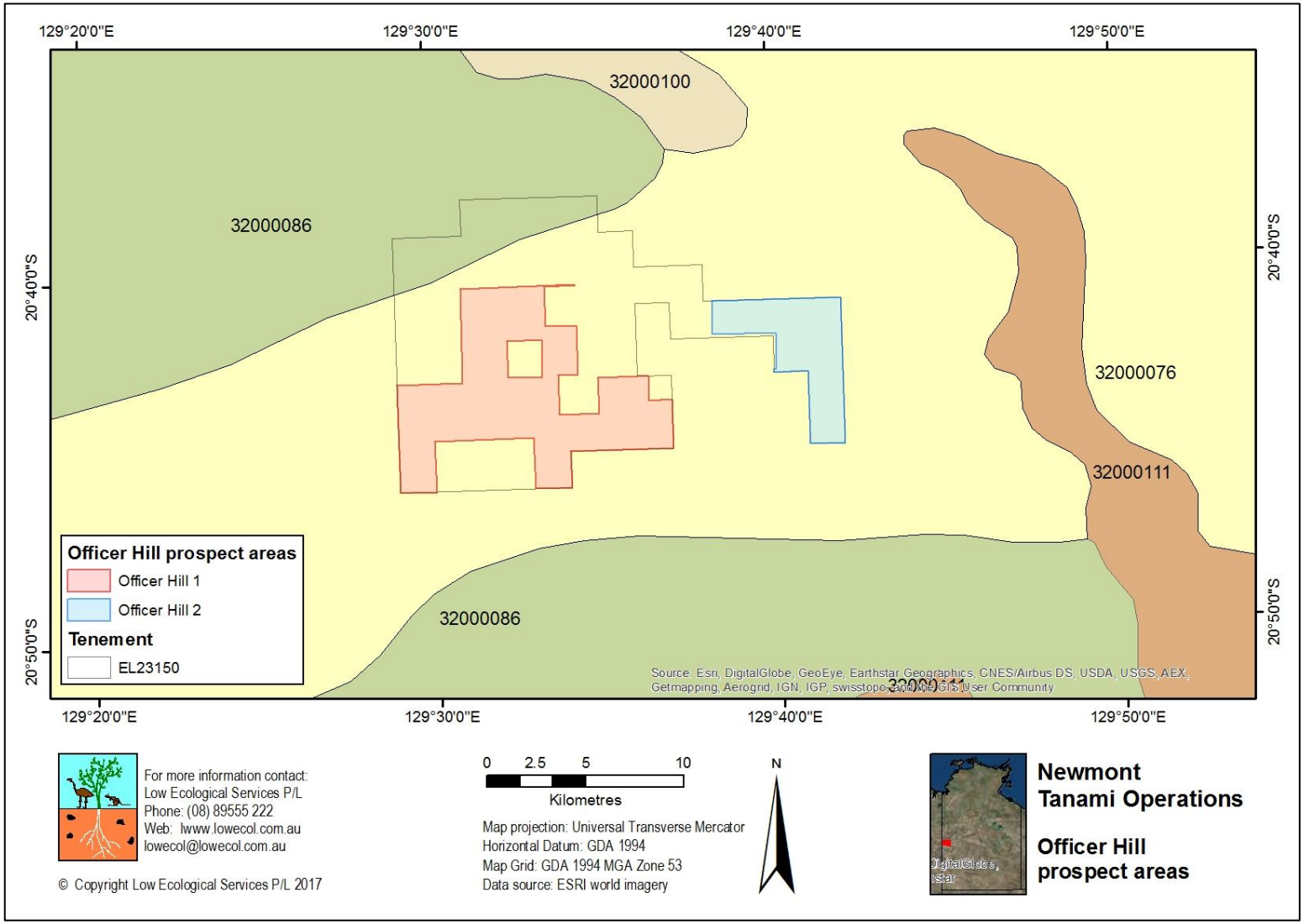


Figure 6: Vegetation types around the Officer Hill project areas, mapped by Wilson *et al.* (1990). Vegetation types are described in Table 4.

3.7 Sites of Conservation Significance

Sites of Conservation significance (SoCS) are 67 sites in the NT identified as the most important sites for biodiversity that need further protecting. The 67 areas include sites both of national and of international significance. The project areas and surrounds are encompassed within the International Site of Conservation Significance, 43: South-west Tanami Desert (Figure 7).

Sites of Botanical Significance (SoBS) are defined as areas that have botanical features distinguishing them from the surrounding landscape, and that are important in terms of the presence of significant plant communities, the presence of species type localities, the integrity of the ecosystems present and the diversity of plant taxa and plant communities present (White, et al., 2000).

There are no SoBs mapped over the Project. The Western Tanami Palaeodrainage Systems SoBS and the Mongrel Downs SoBS occur within 20 km of the project (Figure 7). These sites, respectively, are of national and bioregional significance. The Western Tanami Palaeodrainage System is considered a site of national botanical significance. The landscape incorporates several of the large palaeodrainage features of the central desert and is host to taxa of Australian, NT and bioregional significance. Taxa of Australian significance include *Bergia occultipetala, Bonamia alatisemina, Corynotheca asperata, Eleocharis papillosa, Goodenia A44284 Subsaline* and *Marsilea latzii.* Mongrel Downs is considered a site of bioregional botanical significance. The site is centred on an outlier of clay soil which supports tussock grasslands, and incorporates a palaeodrainage system extending to the north east. Taxa of bioregional significance include *Erodium cygnorum ssp. cygnorum, Sclerolaena patenticuspis, Swainsona burkei* and *Triglochin hexagonum* (White et al. 2000a).

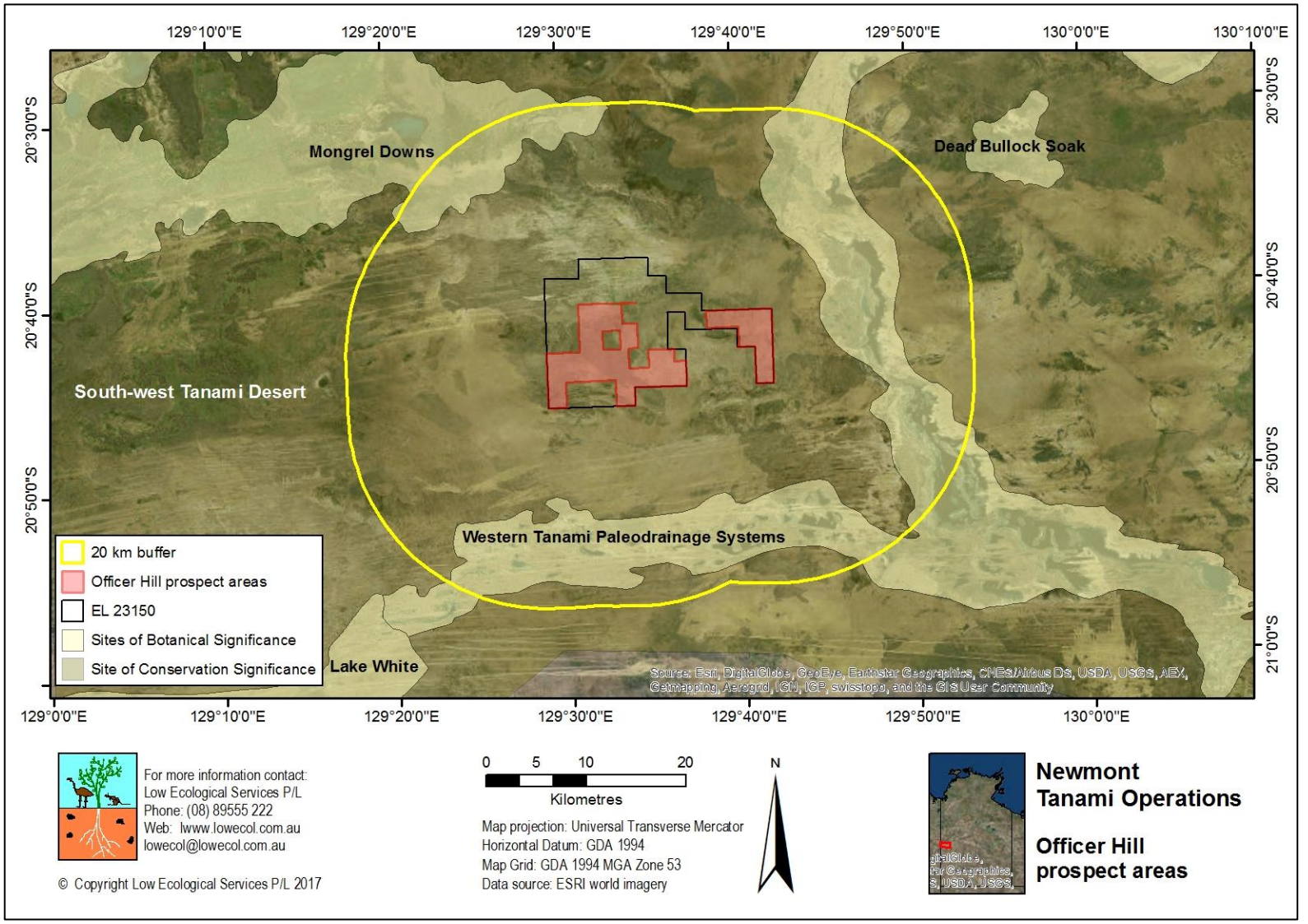


Figure 7: SoCs and SoBs in the area surrounding the Officer Hill projects. Note, the Officer Hill project areas and surrounds are located wholly within the International Site of Conservation Significance, 43: South-west Tanami Desert.

3.8 Fire history

Mapping obtained from the North Australia Fire Information website (North Australia and Rangelands Fire Information, 2016) indicates that fire generally occurs within the project sporadically, burnt 2 of the last 5 years (Table 5, Figure 8).

Table 5: Fires occurring in the survey areas between 2011 and 2016, with the area (km^2) and percentage of the survey areas burnt (%) during those years.

Survey area		2011		2012		2013		2014		2015		2016	
Name	Total area (km^2)	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%
Officer Hill	205	166.39	81.17	0	0	0	0	0	0	0	0	71.25	34.76

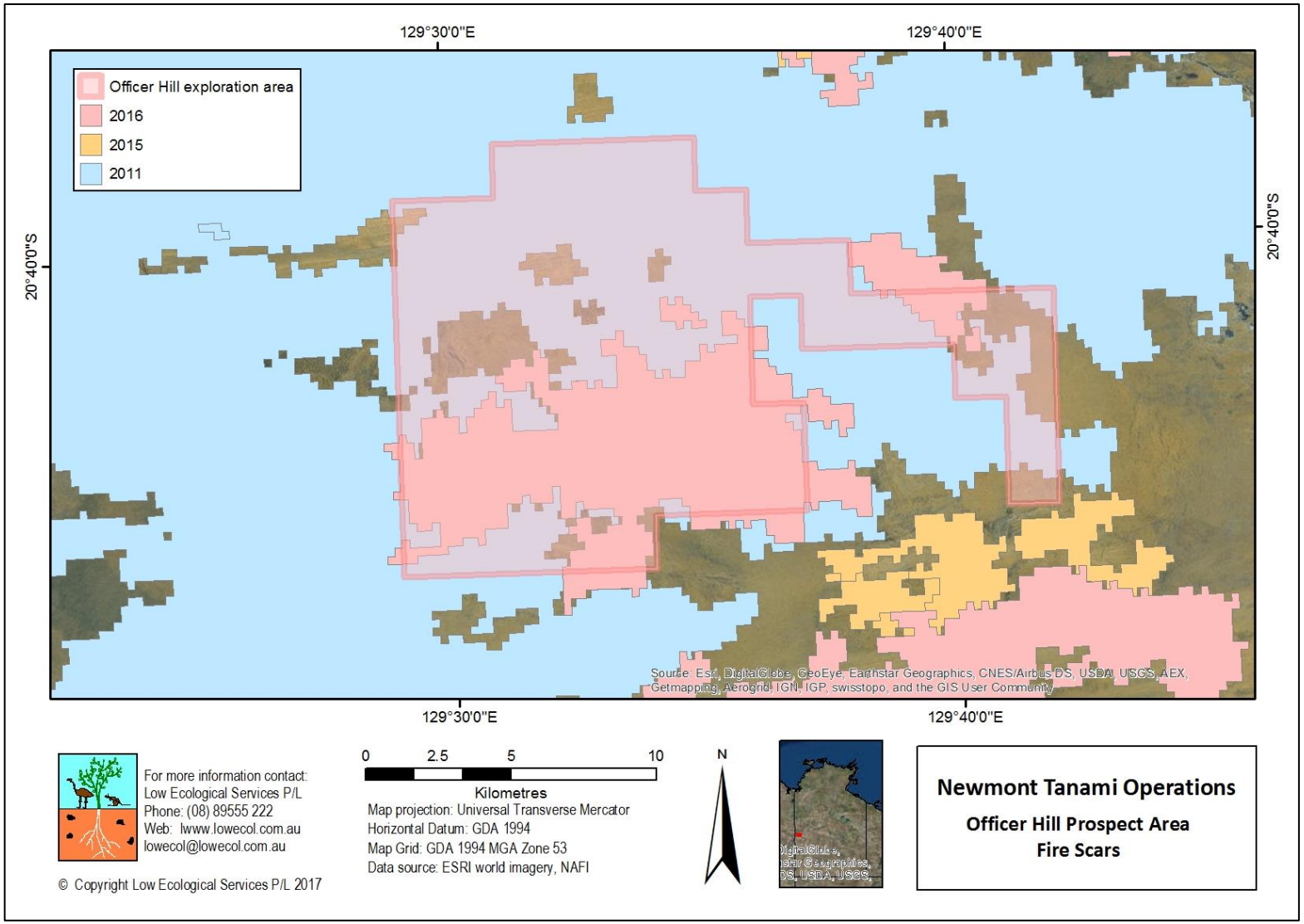


Figure 8: Fire history for the years 2011 – 2016 in the Office Hill project area (North Australia and Rangelands Fire Information, 2016)

3.9 Flora

3.9.1 Flora records

The NT Flora Atlas identified 242 records of 192 flora species within 20 km of the project areas.

3.9.2 Threatened flora species

No species of conservation significance were identified by either the TPWC Act or the EPBC PMST as occurring or potentially occurring within a 20 km radius of the project areas. Eight data deficient species and three near threatened species were identified by the NT Flora Atlas as occurring within 20 km of the survey areas (Table 6). Of these three were determined to have a high likelihood of occurrence and four a moderate likelihood of occurrence in the project area based on existing habitat types.

Table 6: Flora species of conservation significance identified by the TPWC Act as occurring within 20 km of the Officer Hill project areas. NT: near threatened, DD: data deficient.

1 TPWC Act Status: NT: near threatened, DD: data deficient.

Family	Scientific name	Status		NT Flora Atlas	Habitat	Description	Likelihood
		TPWC	EPBC				
AIZOACEAE	*Trianthema glossostigma*	NT	-	X	Rocky sandy soils, lateritic loam. Plains, ridges	Prostrate, much branched annual, herb to 0.02-0.1m high. Flowers white and pink/purple[1].	High
ARALIACEAE	*Trachymene inflata*	NT	-	X	Low quartzite ridge amongst rocks under *Grevillea wickhamii*		Low
BORAGINACEAE	*Heliotropium sphaericum*	DD	-	X	Red soils, recorded in recently disturbed *Triodia pungens* sandplain with *Acacia stipuligera*; *Corchorus sidoides*	Annual herb to 0.2m high. Flowers in May[1]	High
CONVOLVULACEAE	*Bonamia alatisemina*	DD	-	X	Sand. Sand plains. Record observed in disturbed spinifex community	Creeping perennial herb to 0.2m high. Flowers pink/white in April to May[1]	High
FABACEAE	*Acacia pachycarpa*	DD	-	X	Clay. Floodplains, cracking clay pans	Weeping tree or shrub, 2-6m high. Flowers white-cream in May to June[1]	Low
FABACEAE	*Acacia synchronicia*	DD	-	X	Rocky sand, clay or loam, limestone, quartz, lateritic rise	Spreading somewhat diffuse, open to mid-dense, spinescent shrub or tree. 1.5-3m high. Flowers yellow in August to December[1]	Moderate
FABACEAE	*Gompholobium simplicifolium*	NT	-	X	Red sand	Shrub	Moderate
LAMIACEAE	*Dasymalla chorisepala*	DD	-	X	Red sand, dune swales	Shrub. Flowers cream or white	Moderate

Family	Scientific name	Status		NT Flora Atlas	Habitat	Description	Likelihood
		TPWC	EPBC				
						Jan-Dec[1]	
PHRYMACEAE	*Peplidium* sp. Tanami	DD	-	X	Moist red clay or sand, edges of claypans	Prostrate annual, branches to 20cm long. Single flower and 2-3mm long fruit[1]	Low
POACEAE	*Ectrosia lasioclada*	DD	-	X	Sandy soils on the edge of clay pans, with other grasses in savanna woodland or forest	Caespitose perennial, grass-like or herb, 0.7m high[1]	Low
ZYGOPHYLLACEAE	*Tribulus* sp. long-styled eichlerianus	DD	-	X	Red clay loam with *melaleuca* glomerata, *Aristida browniana*	Prostrate herb, leaflet pairs 6-8mm long, petals 15-18mm long[1]	Moderate

[1] (Paczkowska, 1995)

3.9.3 Threatened Ecological Communities

No threatened ecological communities were identified within 20 km of the project.

3.9.4 Introduced and weed species

Weeds of National Significance (WoNS) are declared based on invasiveness, potential for spread and environmental, social and economic impacts. Strategic plans for WoNS are developed as a result of their declaration, which define responsibilities and identify strategies and actions to control the species. Landholders and managers are ultimately responsible for managing WoNS, and the State/Territory government is responsible for overall legislation and administration (Department of Sustainability, Environment, Water, Population and Communities, 2012).

In the NT, a plant is declared a weed under the WM Act if it has been identified for control, eradication or prevention of entry into the NT. All landholders, land managers and land users must comply with the declaration classification. Based on the risk of harm they could cause and how difficult they are to control weeds are placed into the following classes:

- Class A – to be eradicated
- Class B – growth and spread to be controlled
- Class C – not to be introduced into the NT

Four introduced flora species were identified as occurring within 20 km of the survey areas by the NT Weeds dataset (Table 7). None of these species are WoNS or declared weeds under the WM Act. Other weeds known to occur in the Tanami bioregion are mossman river grass (*Cenchrus echinatus)* (declared class B), buffel grass (*Cenchrus ciliaris*) and (*Cyperus involucratus*). Couch grass (*Cynodon dactylon*) is also likely to be spreading (Department of Sustainability, Environment, Water, Population and Communities, 2012).

Table 7: Introduced flora and weed species identified by the NT Flora Atlas and PMST within 20 km of the Officer Hill project areas andwhether the species is a WoNS or declared weed.

Species name	Common name	WoNS	NT Declared	NT Flora Atlas	Habitat	Likelihood
Citrullus colocynthis	Paddy melon	-	-	X	Wide variety of habitats, disturbed sites	Moderate
Cynodon dactylon	Couch grass	-	-	X	Wide variety of habitats, disturbed sites	High
Malvastrum americanum	Spiked malvastrum	-	-	X	Around waterholes, bores, swamps and clay pans, flood outs, riparian zones and disturbed situations	Moderate
Trianthema portulacastrum	Giant pigweed	-	-	X	Disturbed ground or roadsides, occasionally floodplains	Moderate

3.10 Fauna

3.10.1 Fauna records

The NT Fauna Atlas identified 171 records of 78 fauna species within 20 km of the project.

3.10.2 Fauna species of conservation significance

A total of fourteen species of conservation significance were identified as occurring or potentially occurring within 20km of the project. The EPBC PMST identified six fauna species listed under the EPBC Act as occurring or potentially occurring within 20 km of Officer Hill project areas (Table 8). Of these six species, curlew sandpiper *(Calidris ferruginea)* is listed as critically endangered, central rock-rat (*Zyzomys pedunculatus)* and night parrot (*Pezoporus occidentalis)* are listed as endangered, and greater bilby (*Macrotis lagotis)*, princess parrot (*Polytelis alexandrae)*, and great desert skink (*Liopholis kintorei)* are listed as vulnerable. Note, however, central rock-rat (*Zyzomys pedunculatus)* is now considered locally extinct in the Tanami bioregion.

Six records of greater bilby (*Macrotis lagotis)*, listed as vulnerable under both the EPBC Act and TPWC Act, were identified by the NT Fauna Atlas within 20 km of the project (Figure 9). A further 27 records of six species listed as near threatened under the TPWC Act were also identified by the NT Fauna Atlas within 20 km of the project areas (Figure 9). These were: spectacled hare-wallaby (*Lagorchestes conspicillatus leichardti)*, northern nailtail wallaby (*Onychogalea unguifera)*, Australian bustard (*Ardeotis australis*), emu (*Dromaius novaehollandiae*), woma python (*Aspidites ramsayi*), and king brown snake *(Pseudechis australis*).

While there are no records of brush-tailed mulgara (*Dasycercus blythi*) within 20 km of the Officer Hill project areas, there is a high likelihood that this species may occur within the project areas as the species was found to be wide spread and not uncommon during the Regional Biodiversity Monitoring program between 2005 and 2012. The species is listed as vulnerable under the TPWC Act .There are 137 records of *D. blythi* located east of the site; the nearest record is 35 km (Figure 10). Records of *D. blythi* occur predominantly within the same vegetation type as the project areas (open hummock grasslands; see Section 3.2). Suitable habitat for this species is therefore likely found within the project area.

Similarly, although not identified in database searches, southern marsupial mole *(Notoryctes typhlops*) is another species of conservation significance that has a moderate likelihood of occurring in the Project area. The species is listed as vulnerable under the TPWC Act. Given the propensity of marsupial moles to spend almost all of their time underground, capture and study of the animal are rare and knowledge of its current population and distribution is limited. However they are known to inhabit sand dunes and sand plains, particularly those featuring a reasonably complex overstorey vegetation of woodlands including *Acacia* shrubs and understorey shrubs including spinifex, typical of the vegetation and substrate located within the Officer Hill project area. The closest record of *N. typhlops* is 45 km to the south of the Officer Hill project areas.

Generally wallabies, birds and other non-burrowing mammals are considered of low risk to development activities due to their flighty nature and capacity to move out of the way of slow moving equipment. LES considers five species to be susceptible to development activities from data base fauna records and habitat availability. These are burrowing and/or slow moving species: greater bilby *(Macrotis lagotis*), brush-tailed mulgara *(Dasycercus blythi*), great desert skink *(Liopholis kintorei*), southern marsupial mole (*Notoryctes typhlops*) and the woma python (*Aspidites ramsayi*). Whilst the woma python (*Aspidites ramsayi*) is considered highly mobile, it is known to take shelter in burrows of other species and therefore is also considered susceptible to development activities.

Table 8: Fauna species of conservation significance identified by the EPBC PMST and NT Fauna Atlas as recorded or potentially present within 20 km of the Officer Hill project areas.

*LES identified. CR: critically endangered, EN: endangered, VU: vulnerable, NT: near threatened.

Species name	Common name	Status		PMST	NT Flora Atlas	Likelihood	Potential for disturbance
		TPWC	EPBC				
Mammals							
*Dasycercus blythi**	Brush-tailed mulgara	VU				High	High
Lagorchestes conspicillatusleichardti	Spectacled hare-wallaby	NT			X	High	Low
Macrotis lagotis	Greater bilby	VU	VU	X	X	High	Moderate
*Notoryctes typhlops**	Southern marsupial mole	VU				Moderate	Moderate
Onychogalea unguifera	Northern nailtail wallaby	NT			X	Moderate	Low
Zyzomys pedunculatus	Central rock-rat	EN	EN	X		Low (Considered locally extinct)	Low/ None
Birds							
Ardeotis australis	Australian bustard	NT			X	High	Low
Calidris ferruginea	curlew sandpiper	VU	CR	X		Low	Low
Dromaius novaehollandiae	emu	NT			X	High	Low
Pezoporus occidentalis	night parrot	CR	EN	X		Low	Low
Polytelis alexandrae	princess parrot	VU	VU	X		Low	Low
Reptiles							
Aspidites ramsayi	woma python	NT			X	High	Moderate
Liopholis kintorei	great desert skink	VU	VU	X		High	Moderate
Pseudechis australis	king brown snake	NT			X	High	Low

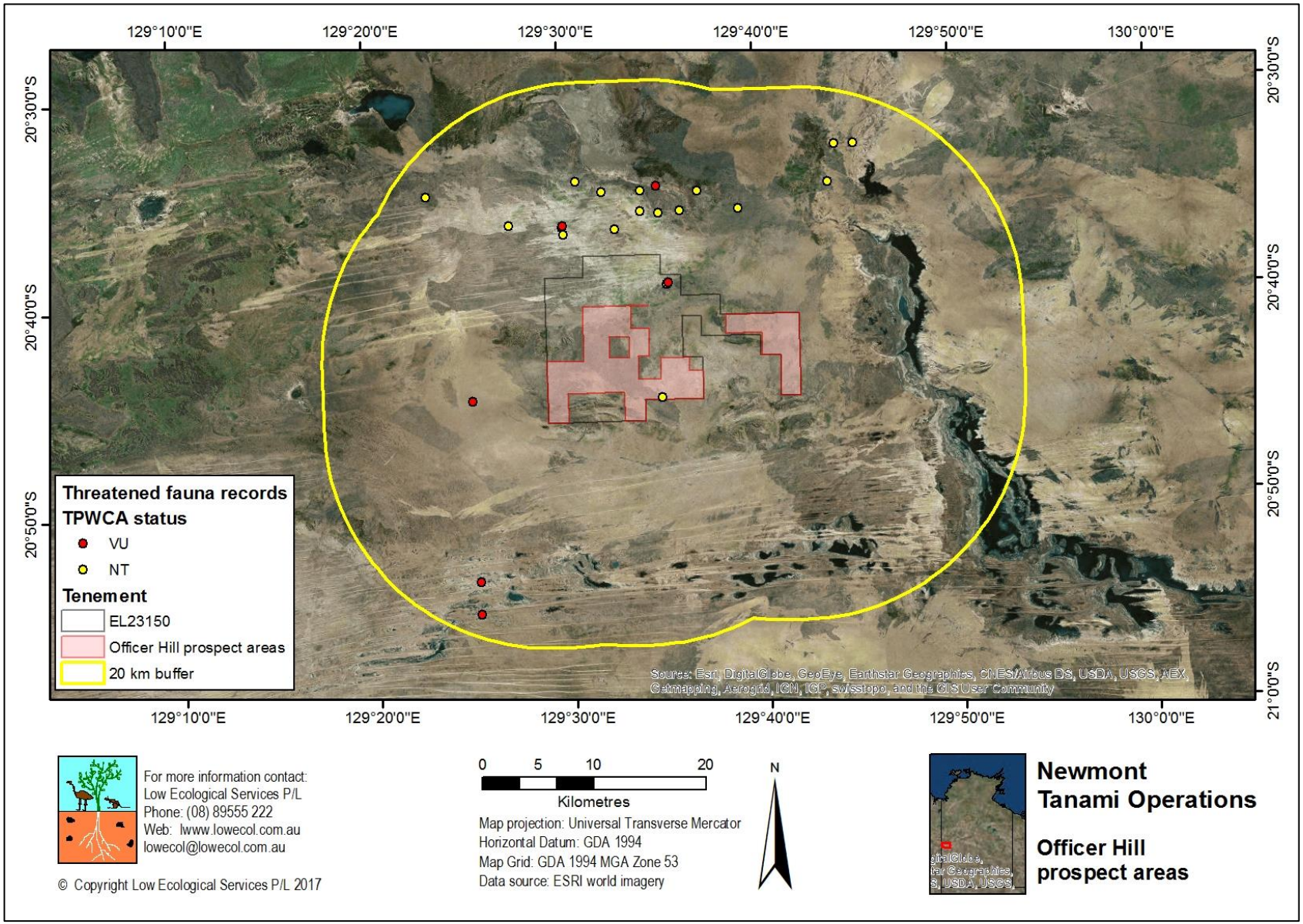


Figure 9: Location of records of fauna species of conservation significance (n=173) listed under the TPWC Act, with records from the NT Fauna Atlas within 20 km of the Officer Hill project areas. Note, there are multiple records from each point.

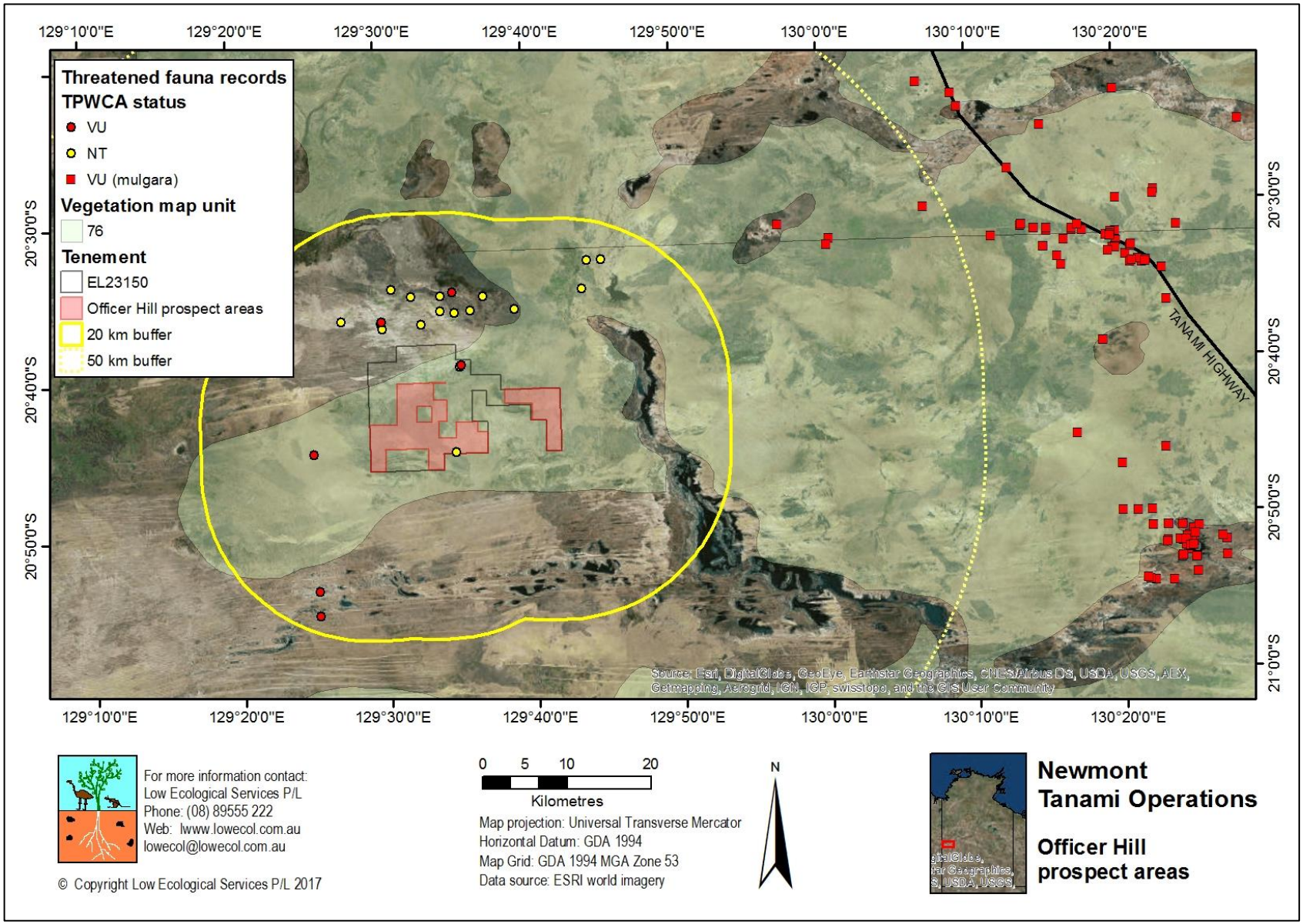


Figure 10. Location of NT Fauna Atlas records of brush-tailed mulgara and habitat of open hummock grasslands (vegetation map unit 76) within the Officer Hill region.

Brush-tailed mulgara (*Dasycercus blythi*)

The brush-tailed mulgara (*Dasycercus blythi*) is primarily nocturnal, burrowing animal, sheltering in burrows approximately 0.5 m deep. The species occurs in a range of vegetation types, primarily mature hummock grasslands of spinifex, especially *Triodia basedowii* and *T. pungens*. Home range size is highly variable with extremes of 1 to 14.4 hectares recorded (Masters, 2003)). Brush-tailed mulgara is known to inhabit both the Western and Simpson deserts as well as the Tanami Desert and as far south as Uluru. The species was once widespread and common throughout the Central Deserts region, but since the 1930s, the species' distribution has declined and is now more restricted and fragmented. Whilst threatening processes are unknown, it is likely that processes of environmental degradation, introduced herbivores, changes to fire regimes and increased predation have likely negatively affected the mulgara (Masters, et al., 2003)

While there are no records of brush-tailed mulgara within 20 km of the project, there are two records within 50 km and a cluster of records along the Tanami highway, about 65 km north east, all within the same vegetation type (Figure 9). Given the potential habitat within the project areas, there is a high likelihood of *D. blythi* occurring. These animals are active as well as inquisitive. They have been known to move into the path of slow moving drilling equipment and may be at risk to development activities.

Spectacled hare-wallaby (*Lagorchestes conspicillatus*)

Lagorchestes conspicillatus leichardti is the subspecies of *L. c. leichardti* that currently occurs on mainland Australia, as opposed to *L. c. conspicillatus* which occurs only on Barrow Island, WA (Winter, et al., 2016). *L. c. leichardti* was formerly distributed across almost half of the Australian continent, but is now only patchily distributed in northern WA and central northern NT, and widespread in northern Queensland (QLD) from Cape York to Rockhampton (Winter, et al., 2016). *Lagorchestes conspicillatus leichardti* inhabits open forests, open woodland, tall shrublands, and tussock and hummock grasslands, and regularly feeds in areas regenerating after fire (Winter, et al., 2016). Breeding occurs year round (Winter, et al., 2016). Threatening processes impacting on *L. c. leichardti* are likely to include predation by foxes and possibly feral cats, introduced herbivores and changes in fire regimes (Winter, et al., 2016).

The nearest record of *L. c. leichardti* to the project areas is 2.5 km to the north, within tenement EL23150. This record was from 1997. Despite being 20 years since the last known record, the species' preference for tussock and hummock grasslands, as well as open forests and woodlands, suggests a high likelihood that *L. c. leichardti* may still occur within the Officer Hill project areas. Generally wallabies and other non-burrowing mammals are considered of low risk to development activities due to their flighty nature and capacity to move out of the way of slow moving equipment.

Greater Bilby (*Macrotis lagotis*)

Macrotis lagotis is a nocturnal medium-size marsupial, originally distributed across 70% of the Australian mainland but now restricted to 20% of its former range in south west QLD and an area extending from the western deserts of the NT and WA north to the Pilbara and Kimberley regions (Pavey, 2006a). *Macrotis lagotis* occurs in a wide variety of habitats that can be classified into three major groups; sparse grassland/forbland on uplands and hills with a low fire frequency, mulga scrub/woodlands on ridges and rises with an infrequent (20-50 year) fire interval and hummock

grassland mixed shrub or woodland steppe on plains and alluvial areas with a high (4-10 year) fire frequency (Southgate, 1990). In the sandy deserts, *M. lagotis* appears to exhibit low site fidelity and high mobility and it is thought that movement of groups is in response to spatial and temporal variability in resource availability (Southgate, et al., 2007). *Macrotis lagotis* is an opportunistic omnivore with a diet consisting of termites, ants, beetles, larvae, grasshoppers, spiders, bush onion (*Cyperus bulbosus*) bulbs, seeds, fruit and fungi (Gibson, 2001; Southgate & Carthew, 2006). It appears that *M. lagotis* can breed at any time of the year in response to resource availability (Southgate, et al., 2000). Threats to *M. lagotis* include predation by introduced predators, habitat degradation by introduced herbivores, altered fire regimes, drought, road mortality and habitat destruction and degradation resulting from mining and other development (Pavey, 2006a).

Six records of *M. lagotis* occur within 20 km of the project areas, spread widely across the Officer Hill region. The closest record of *M. lagotis* to the project areas is 2.5 km to the north of Officer Hill 1, within tenement EL23150. While these records range from 1997–1983, a cluster of recent 2017 *M. lagotis* records have been reported about 50 km to the east of the project areas, around the Granites mine. As a highly mobile species, and habitat generalist, there is a high likelihood that *M. lagotis* occurs within the project areas. This species is considered moderately vulnerable to development activities.

Southern marsupial mole (*Notoryctes typhlops*)

The southern marsupial mole is a small mammal, highly distinctive in shape and appearance (Johnson 1995). It occurs in the sandy deserts of central WA, northern South Australia (SA) and the NT. Within the NT, it has been recorded in locations concentrated in the south-western quarter but has been collected as far north as Barrow Creek (Benshemesh, 2006). Southern marsupial moles are found in the sandy deserts where they occupy dunes, sandy plains and river flats. Underground sign is most common on well vegetated dunes. Marsupial moles are thought to require soft sand and cannot tunnel through hard or loamy substrates that occur in swales between widely spaced dunes (Benshemesh, 2006). Little is known about the reproduction of marsupial moles. So little is known about the southern marsupial mole's current conservation status that it is highly speculative to describe threats. Predation by feral cats, European foxes and dingoes when they are above ground, and soil compaction by stock movements or by vehicles may be potential threats to long term survival (Paltridge, 1998)). Other threats may be changes in abundnace to food resources and altered fire regimes.

No records of the Southern marsupial mole were found within 20 km of the Officer Hill project areas, however records are thought to be significantly lower than actual distribution of the species. Appropriate habitat for marsupial moles including sand dunes and other sandy soils dominates the Officer Hill project area and their presence at the site is considered moderately likely. Given their likelihood of being underground and not detectable from the surface, they are considered at moderate risk to development activities.

Northern nailtail wallaby (*Onychogalea unguifera*)

Onychogalea unguifera has a widespread range throughout northern Australia where it is generally scarce and patchily distributed, but can be locally abundant (Woinarski, et al., 2016). *Onychogalea unguifera* is most commonly found in ecotones between sandy loams and clay in open woodland with tussock grasslands, and shrublands with scattered trees or shrubs (Woinarski, et al., 2016).

Potential threats impacting *O. unguifera* include altered fire regimes, pastoralism and fox predation (Woinarski, et al., 2016).

There are five records of *O. unguifera* within 20 km of the Officer Hill project areas, reported from 1979 to 1985. The nearest records are approximately 10 km to the north, predominantly on the fringes of the clay-based soils and salt pans. The red sandy soils of the project areas suggest sub-optimal habitat for *O. unguifera*, and therefore a moderate likelihood of occurrence. Generally wallabies and other non-burrowing mammals are considered of low risk to development activities due to their flighty nature and capacity to move out of the way of slow moving equipment.

Central Rock-rat (*Zyzomys pedunculatus*)

Zyzomys pedunculatus was considered extinct in 1990 after not being recorded for 30 years (Wurst, 1990 as cited in Nano, *et al*. 2003). The species was subsequently rediscovered in a remote area of the West MacDonnell Ranges in 1996 (Nano, et al., 2003). *Zyzomys pedunculatus* is confined to high elevation (>1,000 m) quartzite ridges and mountain peaks in the West MacDonnell Ranges, west of Alice Springs (McDonald, et al., 2013). The species is irruptive, with reproduction and subsequent population peaks driven by dramatic increases in primary productivity (Edwards, 2013). During these times, it may become locally abundant in a wider variety of rocky habitats (Edwards, 2013). The diet of *Z. pedunculatus* includes predominantly seed and leaf, with a small proportion of stem and invertebrates (Nano, et al., 2003). Potential threatening processes impacting *Z. pedunculatus* include predation by dingos and cats and inappropriate fire regimes (McDonald, 2012).

Zyzomys pedunculatus is now considered locally extinct in the Tanami bioregion. The nearest records of *Z. peduculatus* to the projects areas are approximately 70 km to the east, reported from 1952–1953. As current populations are confined to high ridges and mountain tops in the West MacDonnell Ranges, there is a low likelihood that *Z. peduculatus* is present in the project areas.

Australian bustard (*Ardeotis australis*)

Ardeotis australis is widely distributed across Australia, where it is still common away from settlement in parts of inland and northern Australia and WA (Pizzey & Knight, 2012). *Ardeotis australis* inhabits grasslands, spinifex, open scrublands, grassy woodlands, sandhills, pastoral lands, burned ground, and occasionally crops and airfields (Pizzey & Knight, 2012). The species is irruptive and dispersive in response to rainfall (Pizzey & Knight, 2012). The breeding season of *A. australis* is from August to November in southern Australia and can occur during all months of the year in northern Australia (Pizzey & Knight, 2012). *Ardeotis australis* nests on open bare ground by bush, stones and tussock grasses (Pizzey & Knight, 2012).

The closest record of *A. australis* to the project areas is 2.5 km to the north, within tenement EL23150. Due to the suitability of habitat in the area, previous records, and the widespread distribution of this species, *A. australis* is highly likely to occur within the project areas. Generally, bird species are not considered susceptible to development activities, as they are highly mobile and able to move out of the way of slow moving machinery.

Curlew sandpiper (*Calidris ferruginea*)

Calidris ferruginea inhabits intertidal mudflats in sheltered coastal areas such as estuaries, bays, inlets and lagoons, and also around non-tidal swamps, lakes and lagoons near the coast and ponds in

salt works and sewage farms. Inland sightings have been reported from around ephemeral lakes, dams, waterholes and bore drains, usually with bare areas of mud or sand.

The closest record of *C. ferruginea* to the project areas is approximately 75 km south east. As there are no permanent or ephemeral water bodies located within the project areas, there is a low likelihood that the species will occur. Generally, bird species are not considered susceptible to development activities, as they are highly mobile and able to move out of the way of slow moving machinery.

Emu (*Dromaius novaehollandiae*)

Dromaius novaehollandiae is widely distributed across Australia, where it is mostly absent from areas of settlement, and common in pastoral and cropping areas (Pizzey & Knight, 2012). *Dromaius novaehollandiae* inhabits plains, shrublands, open woodlands, coastal heaths, alpine pastures, semi-deserts, margins of lakes, pastoral and cereal-growing areas (Pizzey & Knight, 2012). The species can be migratory in southern WA, with coastwards movement in spring, after breeding (Pizzey & Knight, 2012). The breeding season of *D. novaehollandiae* is from April to October in southern Australia and can occur during all months of the year in northern Australia (Pizzey & Knight, 2012). *Ardeotis australis* nests on open bare ground by bush, stones and tussock grasses (Pizzey & Knight, 2012).

Dromaius novaehollandiae has been reported from the project areas, on the south east portion of Officer Hill 1. Due to the suitability of habitat in the area, previous records, and the widespread distribution of this species, *D. novaehollandiae* is highly likely to occur within the project areas. Generally, bird species are not considered susceptible to development activities, as they are highly mobile and able to move out of the way of slow moving machinery.

Night parrot (*Pezoporus occidentalis*)

Pezoporus occidentalis is restricted to arid and semi-arid Australia. The distribution of *P. occidentalis* has not been well documented but late 19th and early 20th century records are known from northern WA, SA, New South Wales and western QLD (Pavey, 2006b). Prior to the discovery of a specimen of *P. occidentalis* in north western QLD in 1990, the species was widely considered to be extinct (Pavey, 2006b). More recently, a small popualtion of *P. occidentalis* has been detected in western QLD and another in Western Australia, confirming its persistence (Pyke & Ehrlich, 2014). The species was apparently relatively common in central Australia prior to the 1920's; however there are only unconfirmed records post-1950 (Pavey, 2006b).

Records of *P. occidentalis* are primarily from spinifex (*Triodia* sp.) hummock grasslands in stony or sandy areas and chenopod shrublands on floodplains, salt lakes and claypans, likely being more common in the former (Pavey, 2006b; Pyke & Ehrlich, 2014). *Pezoporus occidentalis* roosts and nests within clumps of these plants and feeds on their seeds (Pyke & Ehrlich, 2014). *Pezoporus occidentalis* is nocturnal and Pyke & Ehrlich (2014) suggest that they are sendentary, but may occasionally fly to and from the areas where they spend most of their time to water sources. Pavey (2006), however, states that *P. occidentalis* appears to be highly nomadic in response to food and water availability, highlighting the lack of consistent information about the ecology of the species. *Pezoporus occidentalis* becomes active during dusk, and generally flies to water before foraging (Pavey, 2006b). The species is said to breed after abundant rainfall, but this is not confirmed. *Pezoporus occidentalis* appears to have suffered widespread decline and local extinction throughout its range beginning prior to the end of the 19th century (Pyke & Ehrlich, 2014). Suggested causes of this decline include

overgrazing of vegetation by rabbits, predation by introduced cats and foxes, stock grazing and altered fire regimes (Pyke & Ehrlich, 2014).

The closest record of *P. occidentalis* to the project areas is approximately 235 km south east on the Tanami Highway from 1999. While there is seemingly suitable habitat for this species in the Officer Hill area, it is thought that current populations of *P. occidentalis* do not persist in the region, and therefore there is a low likelihood that the species will occur in the project areas. Generally, bird species are not considered susceptible to development activities, as they are highly mobile and able to move out of the way of slow moving machinery.

Princess parrot (*Polytelis alexandrae*)

Polytelis alexandrae has a patchy and irregular distribution in the arid zone of WA, NT and SA (Pavey, 2006c; Pavey, et al., 2014). Within the NT, *P. alexandrae* has been recorded from the southern Tanami in the north, south to Yulara and Angas Downs and east to Alice Springs (Pavey, 2006c). The exact distribution within the NT range is unclear as records are irregular and patchy, and there may be long intervals (up to 20 years) between them (Pavey, 2006c). Originally referred to as nomadic or migratory, it is now generally accepted that *P. alexandrae* is irruptive, with a core range that is possibly centred on the Great Sandy Desert or the eastern Gibson Desert and western Great Victoria Desert (Pavey, et al., 2014).

Polytelis alexandrae has been recorded from sandplain environments with vegetation characterised by *Eremophila, Grevillea* and *Hakea* shrubs with scattered trees and less frequently in riverine forest, woodland and shrubland habitats (Pavey, 2006c). *Polytelis alexandrae* forages on the ground and in the foliage of shrubs and trees (Pavey, 2006c; Pavey, et al., 2014). The diet consists of flowers, seeds and other material from a wide range of plants (Pavey, 2006c; Pavey, et al., 2014). *Polytelis alexandrae* breeds in the hollows of *Eucalyptus* trees, predominantly river red gum (*E. camaldulensis*), but also marble gum (*E. gongylocarpa*) and other hollow bearing Eucalypts (Pavey, 2006c; Pavey, et al., 2014). Breeding has been observed between August and November and in January in response to a high continuous rainfall event (Pavey, et al., 2014). Possible causes of decline in this species are environmental degradation and habitat homogenisation post-European settlement in the arid zone, which may have been exacerbated by grazing of rabbits and other introduced herbivores and altered fire regimes (Pavey, 2006c). Local impacts to breeding colonies can also occur through the collection of eggs and fledglings from nests for the overseas bird trade (Pavey, 2006c).

The closest record of *P. alexandrae* to project areas is approximately 65 km north. However, this record is from 1967. There is a low likelihood that this species will occur in the project areas, as there is an absence of large hollow-bearing *Eucalyptus*. Generally, bird species are not considered susceptible to development activities, as they are highly mobile and able to move out of the way of slow moving machinery.

Woma python (*Aspidites ramsayi*)

Aspidites ramsayi is widespread throughout arid and semi-arid Australia, from coastal WA to Western QLD. In the NT, *A. ramsayi* is typically found in desert dunefields and on sandy plains, usually with hummock grasses. They often inhabit existing animal burrows but may also use their head and neck to excavate shelters under hummock grasses or dense bushes (Ehmann & Watson, 2011).Potential threats include land clearance and introduced predators including cats and foxes.

Whilst *A. ramsayi* are no longer listed under the TPWC Act, they remain listed as near threatened in QLD, WA and SA and are IUCN red listed as species of international conservation significance.

The closest record of *A. ramsayi* to the project areas is approximately 17 km north west. Given the propensity of *A. ramsayi* to seek shelter in existing burrows, they are considered at moderate risk to development activities.

Great Desert Skink (*Liopholis kintorei*)

Liopholis kintorei is an endemic arid zone skink, occurring from Uluru-Kata Tjuta National Park north to Rabbit Flat in the Tanami Desert (Pavey, 2006d). *Liopholis kintorei* also occurs in north western SA and in the Gibson Desert and sections of the Great Sandy Desert in WA (Pavey, 2006d). *Liopholis kintorei* is predominantly found in sandplains and adjacent swales containing *Triodia* grassland vegetation and scattered shrubs, but can occupy a range of vegetation types such as lateritic palaeodrainage lines within *Melaleuca* shrubs in the Tanami Desert (McAlpin, 2001). *Liopholis kintorei* is omnivorous, with a diet including plant matter, invertebrates and small vertebrates (McAlpin, 2001). The species' burrows are identifiable by at least one large external latrine (McAlpin, 2001). Breeding occurs between December and February (Pavey, 2006d). Fire, particularly that which takes out all ground cover, has been found to adversely effect *L. kintorei* in spinifex grasslands, and large scale intense fires resulting from a cessation of traditional patch burning may threaten the species (McAlpin, 2001; Moore, et al., 2015). Other potential threatening processes impacting *L. kintorei* include predation by introduced and native predators and increasing tourism pressure, particularly at Yulara (McAlpin, 2001; Pavey, 2006d).

The closest record of *L. kintorei* to the project areas is approximately 36 km north east, reported recently in January 2017. The suitable habitat for *L. kintorei* within the project areas, and near-by current populations, suggests there is a high likelihood of this species occuring. *Liopholis kintorei* is considered at high risk to development activities.

King Brown Snake (*Pseudechis australis*)

Pseudechis australis is widely distributed across mainland Australia, except in the humid eastern and southern areas, occupying a wide variety of habitats from tropical woodlands and monsoon forests to deserts (Wilson & Swan, 2013). *Pseudechis australis* shelters in any terrestrial sites available, including abandoned burrows, soil cracks and hollow logs, and is nocturnal or diurnal according to temperature (Wilson & Swan, 2013).

The closest record of *P. australis* to the project areas is approximately 8 km north. Given the wide distribution of this species and the wide variety of habitats it occupies, there is a high likelihood it is present within the project areas. Generally, non-burrowing species are not considered susceptible to development activities, as they are highly mobile and able to move out of the way of slow moving machinery.

3.10.3 Migratory species

The EPBC PMST identified 10 migratory species as occurring or potentially occurring within 20 km of the Officer Hill project areas (Table 9). None of these 10 species were recorded in the NT Fauna Atlas within 20 km of the project.

Table 9: Fauna species listed as migratory under the EPBC Act as identified by the PMST as having potentially suitable habitat within 20 km of the Officer Hill project areas, their listing under international agreements, and likelihood of occurrence within the project areas.

EPBC Listing: Mi: Migratory; Ma: Marine International Agreement: J: Japan-Australia Migratory Bird Agreement; C: China-Australia Migratory Bird Agreement; R: Republic of Korea-Australia Migratory Bird Agreement; B: Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animals)

Scientific name	Common name	EPBC	PMST	International agreement	Likelihood
Apus pacificus	Fork-tailed swift	Mi, Ma	X	J, C, R	Moderate
Calidris ferruginea	Curlew sandpiper	Mi	X	J, C, R, B	Low
Ardea alba	Great egret	Ma	X	-	Low
Ardea ibis	Cattle egret	Ma	X	-	Low
Charadrius veredus	Oriental plover	Mi, Ma	X	C, J, R, B	Low
Glareola maldivarum	Oriental pratincole	Mi, Ma	X	C, J, R	Low
Hirundo rustica	Barn swallow	Mi, Ma	X	C, J, R	Moderate
Merops ornatus	Rainbow bee-eater	Ma	X	-	High
Motacilla cinerea	Grey wagtail	Mi, Ma	X	C, J, R	Low
Motacilla flava	Yellow wagtail	Mi, Ma	X	C, J, R	Low

Fork-tailed Swift (*Apus pacificus*)

Apus pacificus occurs mostly over inland plains, but sometimes above foothills, in dry or open habitats, including riparian woodland, tea-tree swamps, low scrub, heathland or saltmarsh (Department of the Environment, 2016a). *Apus pacificus* does not breed in Australia, but in Siberia in August - September (Department of the Environment, 2016a). The species arrives in Australia around October each year and stays in the NT until late-April (Department of the Environment, 2016a). Potential threats impacting *A. pacificus* include habitat destruction and predation by feral animals (Department of the Environment, 2016a).

The closest records of *A. pacificus* to the project areas are about 60 km east. While probably sub-optimal, the habitat within the project areas may potentially still be used by *A. pacificus*, particularly after high rainfall. Therefore, there is a moderate likelihood that *A. pacificus* will occur in the project areas during the non-breeding season in Australia.

Curlew sandpiper (*Calidris ferruginea*)

Calidris ferruginea inhabits intertidal mudflats in sheltered coastal areas such as estuaries, bays, inlets and lagoons, and also around non-tidal swamps, lakes and lagoons near the coast and ponds in salt works and sewage farms. Inland sightings have been reported from around ephemeral lakes, dams, waterholes and bore drains, usually with bare areas of mud or sand.

The closest record of *C. ferruginea* to the project areas is approximately 75 km south east. As there are no permanent or ephemeral water bodies located within the project areas, there is a low likelihood of the species occurring there.

Great egret (*Ardea modesta* now *A. alba*)

Ardea modesta was originally treated as a subspecies of *Ardea alba,* but was recently elevated to full species status (Christidis & Boles, 2008). *Ardea modesta* is widespread in Australia, occurring in all States and Territories (Department of the Environment, 2016b). *Ardea modesta* occurs in a wide range of usually shallow wetland habitats including swamps and marshes, margins of rivers and lakes, damp or flooded grasslands, agricultural land, sewage ponds, drainage channels, salt pans, salt lakes, salt marshes, estuarine mudflats, tidal streams, mangrove swamps, coastal lagoons and offshore reefs (Department of the Environment, 2016b). Threats impacting *A. alba* are loss and/or degradation of foraging and breeding habitat through alteration of water flows, drainage and/or clearing of wetlands for development, frequent burning of wetland vegetation, salinization and invasion by exotic plants (Department of the Environment, 2016b).

The closest record of *A. modesta* to the project is approximately 75 km south east. As *A. modesta* inhabits shallow wetlands, there is a low likelihood of the species occurring in the project areas.

Cattle egret (*Ardea ibis*)

There are two major distributions of *A. ibis* in Australia; one from north east WA to the Top End NT, and around south east Australia (Department of the Environment and Energy, 2016a). Non-breeding vagrants have been recorded in central Australia (Department of the Environment and Energy, 2016a). *Ardea ibis* inhabits tropical and temperate grasslands, wooded lands and terrestrial wetlands (Department of the Environment and Energy, 2016a). Its occurrence in the arid and semi-arid zone is extremely rare (Department of the Environment and Energy, 2016a). Threats to this species include persecution of large colonies in urban areas, loss of breeding habitat through wetland degradation and destruction, and hunting on a global scale, and exotic species, particularly cats. (Department of the Environment and Energy, 2016a).

The closest record of *A. ibis* to the project areas is about 500 km north east near Elliot. As this species is rarely found in the semi-arid and arid zone, there is a low likelihood that it will occur within the project areas.

Oriental Plover (*Charadrius veredus*)

The global population of *C. veredus* occurs in coastal and inland areas of Australia during the non-breeding season (Department of the Environment, 2016c). *Charadrius veredus* arrives in Australia in early-mid September and temporarily occupies coastal habitats before dispersing inland (Department of the Environment, 2016c). The species generally leaves Australia between February and April (Department of the Environment, 2016c). In inland Australia, *C. veredus* occupies flat,

open, semi-arid or arid grasslands interspersed with hard bare ground such as claypans, or open areas that have been recently burnt (Department of the Environment, 2016c). There are no known specific threats to *C. veredus* in Australia (Department of the Environment, 2016c).

The closest record of *C. veredus* to the project areas is 40 km east. The absence of clay-based soils suggests there is a low likelihood that *C. veredus* could occur within the project area during the non-breeding season in Australia.

Oriental Pratincole (*Glareola maldivarum*)

Most of the global migratory population of *G. maldivarum* is thought to spend the non-breeding season in Australia (Department of the Environment, 2016d). *Glareola maldivarum* arrives in Australia between late October and early November and departs between mid-March and the first week of April (Department of the Environment, 2016d). In Australia, *G. maldivarum* usually occupies open plains, floodplains or short grassland near terrestrial wetlands and artificial wetlands such as reservoirs and sewage ponds (Department of the Environment, 2016d). There are no immediate threats known to impact *G. maldivarum* (Department of the Environment, 2016d).

The closest record of *G. maldivarum* to the project areas is 76 km south east. The absence of freshwater features, suggests there is a low likelihood of *G. maldivarum* occurring in the project areas during the non-breeding season in Australia.

Barn swallow (*Hirundo rustica*)

Hirundo rustica breeds in the northern hemisphere and migrates to the southern hemisphere during the non-breeding season, occurring in Australia between November and March (Department of the Environment and Energy, 2016b). During the non-breeding season the species occurs in northern Australia, where it inhabits open country in coastal lowlands, often near water, towns and cities, and also in or over freshwater wetlands, *Melaleuca* woodland, mesophyll shrub thickets and tussock grassland (Department of the Environment and Energy, 2016b). *Hirundo rustica* is almost entirely insectivorous. A major threat to *H. rustica* is loss of habitat (Department of the Environment and Energy, 2016b).

The closest record of *H. rustica* to the project areas is about 78 km north. There is a moderate likelihood of *H. rustica* occurring in the project areas during the non-breeding season in Australia.

Rainbow Bee-eater (*Merops ornatus*)

Merops ornatus is found across most of mainland Australia, where the majority of the global population breeds (Department of the Environment, 2016e). The movements of *M. ornatus* are complex and not well understood. The southern populations migrate northwards after breeding to northern Australia, Papua New Guinea and eastern Indonesia between February and June and remain there for the austral winter (May – September) (Department of the Environment, 2016e). Populations that migrate to other countries return to Australia between August and October, and return to breeding sites in southern Australia by November (Department of the Environment, 2016e). *Merops ornatus* inhabits open forests and woodlands, shrublands, grasslands and riparian, floodplain or wetland vegetation assemblages in arid or semi-arid areas (Department of the Environment, 2016e). The only identified threat to *M. ornatus* is the introduced cane toad (*Bufo marinus*) (Department of the Environment, 2016e). Predation by introduced predators may also impact *M. ornatus* populations (Department of the Environment, 2016e).

The closest record of *M. ornatus* to the project is approximately 40 km east. There is a high likelihood that *M. ornatus* will occur in the project areas.

Grey Wagtail (*Motacilla cinerea*)

Motacilla cinerea is a non-breeding summer visitor to Australia between November and April (Pizzey & Knight, 2012). In Australia *M. cinerea* has been recorded near running water in disused quarries, along sandy, rocky streams in escarpments and rainforests, and at sewage ponds, ploughed fields and airfields (Pizzey & Knight, 2012). Deterioration of water and soil quality threatens *M. cinerea* (Department of the Environment, 2016f).

The closest record of *M. cinerea* to the project is approximately 520 km south east at Alice Springs. There is a low likelihood of this species occurring in the project areas.

Yellow Wagtail (*Motacilla flava*)

Motacilla flava was split into *M. flava* and *M. tschutschensus* by Christidis & Boles (2008). This taxonomy is not recognised under the EPBC Act. However the species is listed as *M. tschutschensus* (eastern yellow wagtail) in the NT. *Motacilla flava* is a non-breeding summer migrant to Australia, occurring in mainly coastal areas between November and April (Pizzey & Knight, 2012). In Australia, *M. flava* has been recorded in habitats with short grass and bare ground, swamp margins, sewage ponds, saltmarshes, playing fields, airfields, ploughed land and town lawns (Pizzey & Knight, 2012).

The closest record of *M. flava* (listed as *M. tschutschensus* in the NT Fauna Atlas) to the project is approximately 340 km south east. There is a low likelihood of occurrence in the project areas.

3.10.4 Introduced fauna species

Five introduced fauna species were identified by the EPBC PMST as occurring or potentially occurring within 20 km of the project (Table 10). Three introduced fauna species were recorded by the NT Fauna Atlas within 20 km of the project areas.

Table 10: Introduced fauna species identified as occurring or potentially occurring within 20 km of the Officer Hill project areas, by the NT Fauna Atlas or the EPBC PMST.

Species name	Common name	PMST	NT Fauna Atlas
Camelus dromedarius	Camel	X	X
Canis lupus familiaris	Dog	X	
Felis catus	Cat	X	X
Mus musculus	Mouse	X	
Oryctolagus cuniculus	Rabbit		X
Vulpes vulpes	Fox	X	

4 CONSIDERATION OF SIGNIFICANT IMPACT GUIDELINES 1.1

The Significant Impact Guidelines 1.1 - Matters of National Significance (Department of Environment, 2013), states that an action will require approval if the action has, will have, or is likely to have a *significant impact on a species* listed in any of the following categories:

- extinct in the wild
- critically endangered
- endangered, or
- vulnerable.

Two of the five threatened fauna that may be affected by the project are listed under the EPBC Act as 'vulnerable' - the greater bilby (*Macrotis lagotis*), and the great desert skink (*Liopholis kintorei*). The relevant section from the National Significance Significant Impact Guidelines 1.1 (2013) states that:

> *An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:*
> *• lead to a long-term decrease in the size of an important population of a species*
> *• reduce the area of occupancy of an important population*
> *• fragment an existing important population into two or more populations*
> *• adversely affect habitat critical to the survival of a species*
> *• disrupt the breeding cycle of an important population*
> *• modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline*
> *• result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat*
> *• introduce disease that may cause the species to decline, or*
> *• interfere substantially with the recovery of the species.*

When assessed against this list, the project is highly unlikely to cause any of these events. Potential habitat in the project area that may be affected by development activities spans broadly across the surrounding region with modification or destruction of localised patches unlikely to negatively impact broad population groups. Proposed works in the project area are therefore unlikely to have a significant impact on the vulnerable species and do not trigger the need for approval under the EPBC Act. Additional recommendations to avoid risk to individual members of threatened species whilst working in the project area are summarised in Section 5 of this report.

5 CONCLUSION

Eleven threatened flora species; 8 data deficient and 3 near threatened, were identified by the NT Flora Atlas as occurring within a 20 km radius of the Officer Hill project area. Of these, three were assessed as having a high likelihood and four were assessed as having a moderate likelihood of occurring within the lease area. These species included *Trianthema glossostigma* (high), *Heliotropium sphaericum* (high), *Bonamia alatisemina* (high), *Acacia synchronicia* (moderate), *Gompholobium simplicifolium* (moderate), *Dasymalla chorisepala* (moderate) and *Tribulus* sp. long-styled eichlerianus (moderate).

Four introduced flora species were identified as occurring within 20 km of the survey areas by the NT Weeds dataset; paddy melon (*Citrullus colocynthis* (),couch grass (*Cynodon dactylon*), spiked malvastrum (*Malvastrum americanum*) and giant pigweed (*Trianthema portulacastrum*). None of these species are declared under the WM Act or are WoNS. Other weeds known to occur in the Tanami bioregion are Mossman River Grass *Cenchrus echinatus* (declared under WM Act Class B), buffel grass *Cenchrus ciliaris* and *Cyperus involucratus*. Couch grass *Cynodon dactylon* is also likely to be spreading (Thackway & Cresswell, 1995).

Fourteen fauna species of conservation significance identified by the EPBC PMST, NT Fauna Atlas and LES were identified as potentially occurring within a 20 km radius of the project area. Of these eight were assessed as having a high likelihood of occurrence and two were assessed as having a moderate likelihood of occurrence based on habitat availability. LES considers five of these species to be susceptible to development activities given their behaviour. These are burrowing and/ or slow moving species including greater bilby (*Macrotis lagotis*), brush-tailed mulgara (*Dasycercus blythi*), great desert skink *(Liopholis kintorei*), southern marsupial mole (*Notoryctes typhlops) and* woma python (*Aspidites ramsayi*).Generally, bird species and wallabies are not considered susceptible to development activities, as they are highly mobile and able to move out of the way of slow moving machinery.

Ten fauna species listed as migratory and marine identified by the EPBC PMST however none of these were recorded within 20 km of the project area in the NT Fauna Atlas. Of the 10 species, two were assessed as having a moderate likelihood of occurrence in the lease area; *Apus pacificus* (fork-tailed swift) and *Hirundo rustica* (barn swallow). LES do not generally consider bird species to be susceptible to development activities as they are highly mobile and able to move out of the way of slow moving machinery.

Five introduced fauna species were identified by the EPBC PMST as occurring or potentially occurring within 20 km of the survey areas; camel (*Camelus dromedarius*), dog (*Canis lupis familiaris*), cat (*Felis catus*), mouse (*Mus musculus*), rabbit (*Oryctolagus cuniculus*) and fox (*Vulpes vulpes*), with three of these species (camel, cat and rabbit) recorded by the NT Fauna Atlas within 20 km of the survey areas.

When assessed against the Matters of National Significance Significant Impact Guidelines 1.1 (2013) LES have concluded that the proposed development activities in the Officer Hill Project Area are unlikely to have a major impact on the population of any threatened species in the region.

6 REFERENCES

Ahmad, M., 2000. *Geological map of the Northern Territory, 1:2,500,000,* s.l.: Northern Territory Geological Survey.

Aplin, K. & Woinarski, J., 2008. *Pseudomys johnsoni. The IUCN Red List of Threatened Species 2008: e.T18568A8456766.* [Online] Available at: http://www.iucnredlist.org/details/18568/0 [Accessed 9 October 2016].

Ashton, L. & McKenzie, N., 2001. *Conversion of the Atlas of Australian Soils to the Australian Soil Classification (ASC),* s.l.: CSIRO Land and Water (unpublished).

Baker, B. et al., 2005. *Northern Territory bioregions - assessment of key biodiversity values and threats,* Darwin: Department of Natural Resources, Environment and the Arts.

Bastin, G. & ACRIS Management Committee, 2008. *Rangelands 2008 - Taking the Pulse,* Canberra: Published on behalf of the ACRIS Management Committee by the National Land & Water Resources Audit.

Bennison, K. et al., 2014. Surfacing behaviour and ecology of the marsupial mole (Notoryctes typhlops) at Uluru-KataTjuta National Park. *Australian Mammalogy,* Volume 36, pp. 184-188.

Benshemesh, J., 2005. *Manual for Marsupial Mole Survey and Monitoring by Trenches, Version 1.0,* s.l.: Report to Anangu-Pitjantjatjara Land Management and the Department of Heritage and Environment (SA)..

Benshemesh, J., 2006. *Marsupial mole recovery plan,* Alice Springs: Northern Territory Department of Natural Resources, Environment and the Arts.

Bureau of Meteorology, 2017. *Climate Data Online.* [Online] Available at: http://www.bom.gov.au/climate/data/ [Accessed 10 February 2017].

Christidis, L. & Boles, W. E., 2008. *Systematics and Taxonomy of Australian Birds.* Collingwood: CSIRO Publishing.

Department of Environment, 2013. *Matters of National Environmental Significance - Significant Impact Guidelines 1.1,* Canberra: Commonweatlh of Australia.

Department of Land Resource Management Weed Management Branch, 2015. *Barkly Regional Weed Management Plan 2015 - 2020,* Palmerston, Northern Territory: Northern Territory Government.

Department of Sustainability, Environment, Water, Population and Communities, 2012a. *Australia's bioregions (IBRA).* [Online] Available at: http://www.environment.gov.au/parks/nrs/science/bioregion-framework/ibra/index.html [Accessed 29 January 2012].

Department of Sustainability, Environment, Water, Population and Communities, 2012. *Weeds of National Significance.* [Online]

Available at: http://www.environment.gov.au/biodiversity/invasive/weeds/weeds/lists/wons.html [Accessed 18 September 2012].

Department of the Environment and Energy, 2016a. *Species Profile and Threats Database - Ardea ibis Cattle Egret.* [Online] Available at: http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=59542 [Accessed 9 October 2016].

Department of the Environment and Energy, 2016b. *Species Profile and Threats Database - Hirundo rustica Barn Swallow.* [Online] Available at: http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=662 [Accessed 9 October 2016].

Department of the Environment, 2016a. *Apus pacificus in Species Profile and Threats Database,* Canberra: Department of the Environment.

Department of the Environment, 2016b. *Ardea modesta i Species Profile and Threats Database,* Canberra: Department of the Environment.

Department of the Environment, 2016c. *Charadrius veredus in Species Profile and Threats Database,* Canberra: Department of the Environment.

Department of the Environment, 2016d. *Charadrius veredus in Species Profile and Threats Database,* Canberra: Department of the Environment.

Department of the Environment, 2016d. *Glareola maldivarum in Species Profile and Threats Database,* Canberra: Department of the Environment.

Department of the Environment, 2016e. *Glareola maldivarum in Species Profile and Threats Database,* Canberra: Department of the Environment.

Department of the Environment, 2016e. *Merops ornatus in Species Profile and Threat Database,* Canberra: Department of the Environment.

Department of the Environment, 2016f. *Merops ornatus in Species Profile and Threat Database,* Canberra: Department of the Environment.

Department of the Environment, 2016f. *Motacilla cinerea in Species Profile and Threats Database,* Canberra: Department of the Environment.

Department of the Environment, 2016g. *Motacilla cinerea in Species Profile and Threats Database,* Canberra: Department of the Environment.

Dickman, C. R. et al., 2001. Population dynamics of three species of dasyurid marsupials in arid central Australia: a 10-year study. *Wildlife Research,* Volume 28, pp. 493-506.

DLRM, 2015. *Species Atlas Spatial Datasets,* s.l.: Northern Territory Government.

DoE, 2017. *Protected Matters Search Tool.* [Online] Available at: http://www.environment.gov.au/epbc/pmst/index.html [Accessed 3rd February 2017].

DoE, 2017. *Species Profile and Threats Database.* [Online] Available at: http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl [Accessed 17 February 2017].

Domahidy, G., 1990. *Hydrogeology of The Granites - Tanami Mining Region. Explanatory notes for the 1:250000 Scale Map.Report 74 ,* Northern Territory: Power and Water Authority.

DSEWPaC, 2013a. *Andropogon gayanus.* [Online] Available at: http://www.environment.gov.au/cgi-bin/biodiversity/invasive/weeds/weeddetails.pl?taxon_id=66895# [Accessed 3 January 2017].

Duguid A., B. K. C. B. P. C. A. D. R. K. a. M. N., 2005. *Wetlands in the arid northern Territory. A report to the Australian Government Department of the Environment and Heritage on the inventory and significance of wetlands in the arid Northern Territory. ,* Alice Springs: Northern Territory Government Department of Natural Resources Environment and the Arts.

Edwards, G. P., 2013. Relative abundance of the central rock-rat, the desert mouse and the fat-tailed pseudantechinus at Ormiston Gorge in the West MacDonnell Ranges National Park, Northern Territory. *Australian Mammalogy,* Volume 35, pp. 144-148.

Ehmann , H. & Watson, M., 2011. *Biodiversity Factsheet: Woma python (Aspidites ramsayi),* SA: Government of South Australia:South Australian Arid Lands Natural Resources Management Board.

Environment, D. o. t., 2017. *Species Profile and Threats Database.* [Online] Available at: http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl [Accessed 17 February 2017].

Gibson, L. A., 2001. Seasonal changes in the diet, food availability and food preference of the greater bilby (Macrotis lagotis) in south-western Queensland. *Wildlife Research,* Volume 28, pp. 121-134.

Holmes, J. & Low, W. A., 2000. *Environmental Impact Assessment of the Proposed Haulroad from the Groundrush Project Evaluation Area to Tanami Mine. ,* Wayville, S.A.: Normandy North Flinders Mining Ltd.

Isbell, R. & National Committee on Soil and Terrain, 2016. *The Australian Soil Classificatoin 2nd ed.,* s.l.: CSIRO Publishing.

Letnic, M. & Dickman, C. R., 2005. The responses of small mammals to patches regenerating after fire and rainfall in the Simpson Desert, central Australia. *Austral Ecology,* 30(1), pp. 24-39.

Low, W. A., Degnian, K. & Dowling, T., 2015. *Henbury Access Road Springs Landscape, Flora and Fauna Baseline Survey Summary,* s.l.: Unpublished communication from Low Ecological Services P/L to Tellus Holdings Ltd.

Low, W. A., Degnian, K., Mitchell, K. & Gomez, D., 2016. *Henbury Access Road Autumn 2016 Landscape, Flora and Fauna Baseline Survey Summary,* s.l.: Unpublished communication from Low Ecological Services P/L to Tellus Holdings.

Low, W. A., Fowler, M. & Nelson, D. J., 1994. *Landscape, flora and vertebrate fauna survey of the CDJV project area at Redback, Dogbolter and Jims south of Tanami Well. Report for Billiton Australia, Melbourne. Appendix C In central Desert Joint Venture Project Preliminary Environmental Report,* Melbourne: NSR Environmental Consultants.

Malcom, P., 2012. *Cullen Walkingtonii. The IUCN Red List of Threatened Species 2012: e.T19892856A20132110.* [Online]

Available at: http://www.iucnredlist.org/details/19892856/0 [Accessed 10 October 2016].

Masters, P., 2003. Movement patterns and spatial organisation of the mulgara, Dasycercus cristicauda, in central Australia. *Wildlife Research,* Volume 30, pp. 339-344.

Masters, P., Dickman, C. R. & Crowther, M., 2003. Effects if civer reduction on mulgara Dasycercus cristicauda rodent and invertegrate populations in central Australia: implications for land management. *Austral Ecology,* Volume 28, pp. 658-665.

McAlpin, S., 2001. *A Recovery Plan for the Great Desert Skink (Egernia kintorei) 2001-2011,* Alice Springs: Arid Lands Environment Centre.

McCracken, H. E., 1990. Reproduction in the greater bilby, Macrotis lagotis (Reid) - a comparison with other peramelids. In: J. H. Seebeck, P. R. Brown, R. I. Wallis & C. M. Kemper, eds. *Bandicoots and Bilbies.* Sydney: Surrey Beatty and Sons, pp. 199-204.

McDonald, P., 2012. *Threatened Species of the Northern Territory- Central Rock-rat Zyzomys pedunculatus,* Northern Territory: Department of Land Resource Management.

McDonald, P. J. et al., 2013. Extant population of the critically endangered central rock-rat Zyzomys pedunculatus located in the Northern Territory, Australia. *Oryx,* Volume 37, pp. 303-306.

Moore, D. et al., 2015. Is fire a threatening process for Liopholis kintorei, a nationally listed threatened skink. *Wildlife Research,* Volume 42, pp. 207-216.

Moseby, K. E., Peacock, D. E. & Read, J. L., 2015. Catastophic cat predation: A call for predator profiling in wildlife protection programs. *Biological Conservation,* Volume 191, pp. 331-340.

Nano, T. J., Smith, C. M. & Jefferys, E., 2003. Investigation into the diet of the central rock-rat (Zyzomys pedunculatus). *Wildlife Research,* Volume 30, pp. 513-518.

North Australia and Rangelands Fire Information, 2016. *North Australia and Rangelands Fire Information website.* [Online] Available at: www.firenorth.org.au [Accessed July 2016].

North Australia Fire Information, 2013. *North Australia Fire Information website.* [Online] Available at: www.firenorth.org.au [Accessed September 2013].

Northcote, K., 1968. *Atlas of Australian Soils.* Melbourne: CSIRO and Melbourne University Press.

Oliver, I. et al., 2004. Land systems as surrogates for biodiversity in conservation planning. *Ecological Applications,* 14(2), pp. 485-503.

Paczkowska, G., 1995. *Florabase Western Australia.* [Online] Available at: https://florabase.dpaw.wa.gov.au/browse/profile/2826 [Accessed February 2017].

Paltridge, R., 1998. Occurrence of marsupial mole (Notoryctes typhlops) remains in the faecal pellets of cats, foxes and dingoes in the Tanami Desert N.T.. *Australian Mammology,* Volume 20, pp. 427-429.

Pavey, C., 2006a. *National Recovery Plan for the Greater Bilby Macrotis lagotis,* s.l.: Northern Territory Department of Natural Resources, Environment and the Arts.

Pavey, C., 2006b. *Threatened Species of the Northern Territory - Night Parrot Pezoporus occidentalis,* Northern Territory: Parks and Wildlife Commission.

Pavey, C., 2006c. *Threatened Species of the Northern Territory - Princess Parrot Polytelis alexandrae,* Northern Territory: Parks and Wildlife Commission.

Pavey, C., 2006d. *Threatened Species of the Northern Territory - Great Desert Skink Tjakura Egernia kintorei,* Northern Territory: Parks and Wildlife Commission.

Pavey, C., 2006e. *Threatened Species of the Northern Territory - Great Desert Skink Tjakura Egernia kintorei,* Northern Territory: Parks and Wildlife Commission.

Pavey, C., Cole, J. & Woinarski, J., 2006a. *Threatened Species Fact Sheet: Brushtailed Mulgara Dasycerus blythi.* [Online] Available at: http://www.lrm.nt.gov.au/__data/assets/pdf_file/0016/10825/brushtailed_mulgara_vu.pdf [Accessed 12 November 2012].

Pavey, C. et al., 2011. Habitat use, population dynamics and species identification of mulgara, Dasycercus blythi and D. cristicauda, in a zone of sympatry in central Australia. *Australian Journal of Zoology,* Volume 59, pp. 156-169.

Pavey, C. R., 2006a. *National Recovery Plan for the Greater Bilby Macrotis lagotis,* s.l.: Northern Territory Department of Natural Resources, Environment and the Arts.

Pavey, C. R. et al., 2014. The breeding and foraging ecology and abundance of the Princess Parrot (Polytelis alexandrae) during a population irruption. *Emu,* Volume 114, pp. 106-115.

Perry, R. A., Mahbbutt, J. N., Litchfield, W. H. & Quinlan, T., 1960. *Land Systems of the Alice Springs Area, Northern Territory, Australia: CSIRO Land Research Series No. 6,* s.l.: CSIRO.

Pizzey, G. & Knight, F., 2012. *The Field Guide to the Birds of Australia,* Sydney: Harper Collins.

Pyke, G. H. & Ehrlich, P. R., 2014. Conservation of the Holy Grail: The Story of the Night Parrot. *Pacific Conservation Biology,* Volume 20, pp. 221-226.

Southgate, R. & Carthew, S. M., 2006. Diet of the bilby (Macrotis lagotis) in relation to substrate, fire and rainfall characteristics in the Tanami Desert. *Wildlife Research,* Volume 33, pp. 507-219.

Southgate, R. I., 1990b. Habitat and diet of the greater bilby Macrotis lagotis Reid (Marsupiala: Peramelidae). In: *Bandicoots and Bilbies.* s.l.:Surrey Beatty & Sons, pp. 303-309.

Southgate, R. I., 1990. Habitat and diet of the greater bilby Macrotis lagotis Reid (Marsupiala: Peramelidae). In: *Bandicoots and Bilbies.* s.l.:Surrey Beatty & Sons, pp. 303-309.

Southgate, R. I., Christie, P. & Bellchambers, K., 2000. Breeding biology of captive, reintroduced and wild greater bilbies, Macrotis lagotis (Marsupialia: Peramelidae). *Wildlife Research,* Volume 27, pp. 621-628.

Southgate, R., Paltridge, R., Masters, P. & Carthew, S., 2007. Bilby distribution and fire: a test of alternative models of habitat suitability in the Tanami Desert, Australia. *Ecography,* Volume 30, pp. 759-776.

Thackway, R. & Cresswell, I. D., 1995. *An Interim Biogeographic Regionalisation for Australia: a framework for setting priorities in the national reserves system cooperative program,* Canberra: Commonwealth of Australia.

White, M. et al., 2000. *Plant species and sites of botanical significance. Volume 2: Significant sites. Part 1: Sites of significance,* Alice Springs: Arid Lands Environment Centre.

Wilford , J. R. & Butrovski, D., 1999. *Tanami Granites Regolith-Landforms Map Series (1:100,000 map scale),* s.l.: CONFIDENTIAL.

Wilson, B. A., Brocklehurst, P. S., Clark, M. J. & Dickinson, K. J. M., 1990. *Vegetation Survey of the Northern Territory, Australia..* Darwin: Conservation Commission of the Northern Territory.

Wilson, S. & Swan, G., 2013. *A Complete Guide to Reptiles of Australia.* 4th ed. Sydney: New Holland.

Winter, J., Woinarski, J. & Burbidge, A., 2016. *Lagorchestes conspicillatus. The IUCN Red List of Threatened Species 2016: e.T11161A21954319.* [Online] Available at: http://www.iucnredlist.org/details/11161/0 [Accessed 9 October 2016].

Woinarski, J., Winter, J. & Burbudge, A., 2016. *Onychogalea unguifera. The IUCN Red List of Threatened Species 2016: e.T40568A21958021.* [Online] Available at: http://www.iucnredlist.org/details/40568/0 [Accessed 9 October 2016].

7 APPENDICES

APPENDIX 1. EPBC PMST Report for the Project area including a 20 km buffer

Australian Government
Department of the Environment and Energy

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about Environment Assessments and the EPBC Act including significance guidelines, forms and application process details.

Report created: 10/02/17 19:44:24

This map may contain data which are ©Commonwealth of Australia (Geoscience Australia), ©PSMA 2010

Coordinates
Buffer: 20.0Km

Summary

Matters of National Environmental Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	6
Listed Migratory Species:	7

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at http://www.environment.gov.au/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Land:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	10
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Commonwealth Reserves Marine:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have nominated.

State and Territory Reserves:	1
Regional Forest Agreements:	None
Invasive Species:	6
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Listed Threatened Species		[Resource Information]
Name	Status	Type of Presence
Birds		
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Pezoporus occidentalis Night Parrot [59350]	Endangered	Species or species habitat may occur within area
Polytelis alexandrae Princess Parrot, Alexandra's Parrot [758]	Vulnerable	Species or species habitat may occur within area
Mammals		
Macrotis lagotis Greater Bilby [282]	Vulnerable	Species or species habitat known to occur within area
Zyzomys pedunculatus Central Rock-rat, Antina [68]	Endangered	Species or species habitat may occur within area
Reptiles		
Liopholis kintorei Great Desert Skink, Tjakura, Warrarna, Mulyamiji [83160]	Vulnerable	Species or species habitat may occur within area

Listed Migratory Species		[Resource Information]
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
Hirundo rustica Barn Swallow [662]		Species or species habitat may occur within area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Migratory Wetlands Species		

Name	Threatened	Type of Presence
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Charadrius veredus Oriental Plover, Oriental Dotterel [882]		Species or species habitat may occur within area
Glareola maldivarum Oriental Pratincole [840]		Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea alba Great Egret, White Egret [59541]		Species or species habitat likely to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Charadrius veredus Oriental Plover, Oriental Dotterel [882]		Species or species habitat may occur within area
Glareola maldivarum Oriental Pratincole [840]		Species or species habitat may occur within area
Hirundo rustica Barn Swallow [662]		Species or species habitat may occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area

Extra Information

State and Territory Reserves [Resource Information]

Name	State
Southern Tanami	NT

Invasive Species [Resource Information]

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resouces Audit, 2001.

Name	Status	Type of Presence
Mammals		
Camelus dromedarius Dromedary, Camel [7]		Species or species habitat likely to occur within area
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Cenchrus ciliaris Buffel-grass, Black Buffel-grass [20213]		Species or species habitat may occur within area

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species distributions have been derived through a variety of methods. Where distributions are well known and if time permits, maps are derived using either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc) together with point locations and described habitat; or environmental modelling (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where very little information is available for species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc). In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More reliable distribution mapping methods are used to update these distributions as time permits.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

Coordinates

-20.660671 129.471312,-20.661314 129.673872,-20.661314 129.673872,-20.660671 129.673872,-20.76536 129.676619,-20.766002 129.472685,-20.660671 129.471312

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact Us page.

Appendix B – HS&S and S&ER Policies

NEWMONT AUSTRALIA

Environment
STATEMENT OF COMMITMENT

Newmont Australia believes that responsible environmental management and leading environmental performance is integral to an effective and successful company. This will be achieved through leadership and the use of formal management systems that support effective decision making, manage company risks and drive continuous improvement.

Each Australian site commits to:

COMPLY
with all applicable legal requirements and other commitments to which we subscribe, as a minimum standard;

IMPLEMENT
and maintain the Integrated Management System (IMS) and Discipline Specific Standards to mitigate risk of harm to communities and the environment. The IMS provides the framework for setting and reviewing objectives and targets to ensure continuous improvement;

INTEGRATE
environmental considerations into all aspects of the company's business decisions and activities in order to minimise environmental impact, prevent pollution, mitigate associated long term financial liability and enhance social benefit;

SELECT
appropriately qualified and competent people, and provide training to ensure employees, contractors and suppliers work in a responsible manner with due consideration to the environment;

ENGAGE
stakeholders on their concerns, aspirations and values regarding the development, operational and closure aspects of mineral projects, recognising that there are links between environmental, economic, social and cultural issues;

COMMUNICATE
openly about our performance in an accurate, transparent and timely manner;

IDENTIFY
and assess risks and improvement opportunities and develop and implement strategies and plans to manage significant risks, including but not limited to:

Water –
implement the Global Water Strategy to ensure that water is valued and managed as a precious resource;

Energy and Greenhouse –
implement the Global Energy and Climate Change Strategy to improve energy efficiency, reduce greenhouse gas emissions and reduce operating costs;

Mine Legacy –
ensure that mine closure activities are planned and concurrently implemented during the operational phase and that all relevant stakeholders are consulted throughout this process to ensure an integrated approach to final land-use planning;

Tailings Management –
design, operate and close tailings storage facilities to minimise risks to the environment and stakeholders;

Waste rock –
manage waste rock to ensure potential drainage issues are identified and managed and rehabilitation strategies promote safe and stable structures;

Biodiversity –
understand the biodiversity context within which we operate and develop management plans to mitigate any potential impacts.

Alex Bates

Alex Bates, Regional Senior Vice President
Newmont Australia, June 2017

NAP-IMS-PO-70-15597-Version 8.2

NEWMONT AUSTRALIA

Social Responsibility
STATEMENT OF COMMITMENT

Newmont Australia believes that leading social responsibility is essential to our business and is demonstrated through building relationships based on trust and adding value to the communities in which we operate. This will be achieved through leadership and the use of formal management systems that support effective decision making, manage company risks and promote continuous improvement.

Each Australian site commits to:

COMPLY
with all applicable legal requirements and other commitments to which we subscribe, as a minimum standard;

IMPLEMENT
and maintain the Integrated Management System (IMS) and Discipline Specific Standards to mitigate the risk of harm to communities and the environment. The IMS provides the framework for setting and reviewing objectives and targets to ensure continuous improvement;

IDENTIFY
social impacts by conducting independent Social Impact Assessments, risk and opportunity assessments and develop and implement continuous improvement plans to manage the significant impacts, risks and opportunities;

ENGAGE
stakeholders on their concerns, aspirations and values regarding the development, operational and closure aspects of mineral projects, recognising the strong links between economic, social and cultural issues;

CREATE
shared value with local communities by maximising local procurement and enterprise development, local employment, training and community development opportunities;

INTEGRATE
social considerations into all aspects of the company's business decisions and activities, including exploration, project development, mine operation, mine expansion, acquisitions, divestments and closures to avoid or mitigate adverse social impacts and enhance social benefit;

RESPECT
the dignity, wellbeing and human rights of employees and the communities in which we live and ensure all levels of the workforce complete training to understand and respect these rights;

DEMONSTRATE
our commitment to Indigenous rights by acknowledging and respecting local cultural norms and work to obtain free, prior and informed consent of indigenous peoples as reflected in the International Council on Mining and Metals (ICMM) Position Statement;

SELECT
appropriately qualified and competent people, and provide training to ensure employees, contractors and suppliers act on the potential and actual social impact of their activities;

COMMUNICATE
openly about our performance in an accurate, transparent and timely manner.

Alex Bates, Regional Senior Vice President
Newmont Australia, June 2017

NAP-IMS-PO-70-15598-Version 7.2

NEWMONT AUSTRALIA

Health and Safety
STATEMENT OF COMMITMENT

At Newmont Australia, we are committed to safety and health and it is an integral part of the way we conduct our business.

We are committed to continual improvement in performance and to Zero Harm.

Each Australian site commits to:

IDENTIFY
assess and manage risks.

COMPLY
with all legal, regulatory and other requirements to which the organization subscribes that relate to safety and health.

COMMUNICATE
openly on all aspects of safety and health.

DEVELOP
our people and provide resources to assist them achieve our safety and health targets.

ENSURE
our leaders provide active visible leadership and are safety role models.

ESTABLISH
and achieve targets that support our vision of Zero Harm; and

STRIVE
to achieve leading practice in safety and health.

We will communicate the requirements of this statement of commitment to all personnel including key stakeholders.

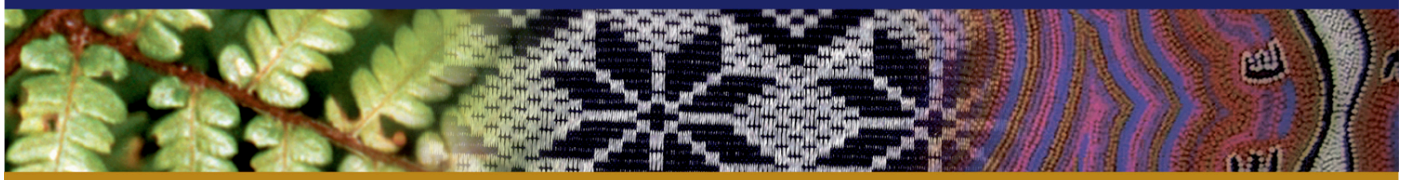
Alex Bates, Regional Senior Vice President
Newmont Australia, June 2017

NAP-IMS-PO-70-16051-Version 7.3

Appendix C – Newmont Australia Integrated Management System Manual

NEWMONT
ASIA PACIFIC

Integrated Management System



IMS Manual

Contents Page

Standards

1. Introduction

Newmont Mining Corporation (NMC) is a leading gold producer with operations in North and South America, Africa, Indonesia, and Australia. The Asia Pacific Region (APAC) comprises operations in Australia, New Zealand and Indonesia.

Newmont's Mission is to '*transform mineral resources into shared value for our stakeholders and lead the industry in shareholder returns, safety, social responsibility and environmental stewardship*'

Newmont activities, by their nature, have the potential to impact the health and safety of people, the environment or communities. These impacts must be identified, evaluated and managed to minimise risks.

The APAC Integrated Management System (IMS) is an integral part of Newmont APAC's business as it provides the framework for how Health and Safety (H&S) and Sustainability and External Relations (S&ER) is integrated into the business through the establishment of the region's Statements of Commitment, Standards and Regional Procedures which define the intentions and principles for H&S and S&ER performance.

The implementation and maintenance of the APAC IMS provides the means to manage and minimise risks, comply with legislation and NMC Standards, and ensures a commitment to continuous improvement.

2. Purpose of the IMS

The APAC IMS has these core purposes:

- Regional standardisation in business processes for H&S and S&ER.
- Compliance with Newmont IMS and Discipline Specific or Technical Standards.
- Maintain certification to OHSAS 18001:2007 and ISO 14001:2004 International Standards.

The APAC IMS is designed to provide a framework for establishing commitment at all levels of the business in order to manage risks to order to:

- Prevent and eliminate workplace injury and ill health.
- Reduce adverse environmental impacts.
- Engage employees, contractors and external stakeholders.
- Ensure continuous improvement in H&S and S&ER performance.
- Enhance Newmont's reputation through effective delivery on commitments.

3. Scope of the IMS

The scope of the APAC IMS covers all activities undertaken by Newmont APAC operations and facilities that have the potential to affect H&S and S&ER performance. Activities defined within the scope of the IMS covers the entire life-cycle of the operations from exploration through to closure and rehabilitation activities until lease relinquishment.

The main function of the Subiaco Office is to provide a framework, guidance and support for IMS activities at the operations, such as risk management, document control centre, action management, reporting and review.

Where Newmont does not have direct responsibilities for its activities, but has an equity stake or Newmont assets are involved, these Standards are made available and communicated to ensure Newmont expectations are met.

4. Document Hierarchy

APAC IMS documents follow a structure shown in Figure 1.

Corporate Policies, the Code of Business Ethics and Conduct, and Discipline Specific or Technical Standards (DSS & TS) are mandatory to all Newmont global operations. The DSS/TS standards reflect the key global risks identified by Newmont. These performance standards are found under Operational Control (IMS Standard 16).

APAC IMS Statements of Commitment are established for H&S, Environment and Social Responsibility are aligned to the corporate policies and fundamentally represent the APAC region's policies for these disciplines.

APAC IMS Standards define the *Intent*, *Requirements* and *Accountability* for each of 17 elements that make up the management system. The *Requirements* section is structured to present the general *Approach* of the Standard, *Deployment* or how the standard is implemented, and *Review* by senior leadership teams. References are also made to the relevant international standards to provide relevancy and alignment.

The Standards have supporting Regional Procedure(s) that are overarching and represent common management system processes that are employed across the APAC region. The Procedures are mandatory requirements.

Site procedures are necessary where they are required to describe specific processes that may not be covered in sufficient detail by the Regional or Corporate documentation.

Documents also include Forms, Schedules, Check Sheets, Audit Protocols and Training materials to assist operations and facilities to effectively implement and maintain the IMS at their sites. The IMS will continue to be developed where deficiencies are identified and actions are taken to improve the management system further.

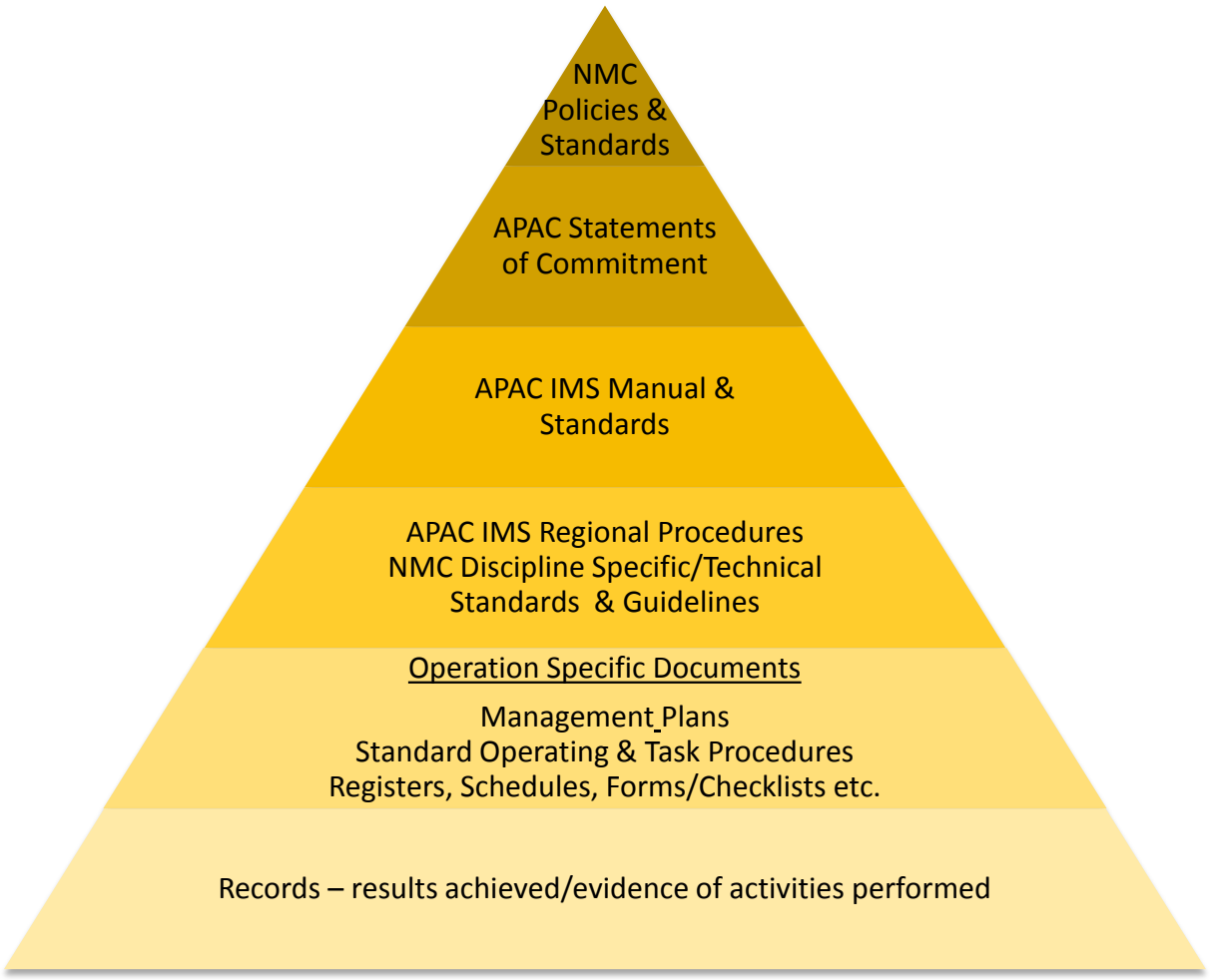


Figure 1. Generalised IMS Document Hierarchy

5. Elements of the IMS

There are seventeen standards in the APAC IMS (Figure 2). How these standards relate to the elements of ISO14001 and OHSAS18001 are shown in Table 1. These standards provide the framework for the Newmont IMS and aim to identify and implement continuous improvement in H&S and S&ER operational performance.

The structure of the APAC IMS is aligned to the Plan-Do-Check-Act (PDCA) model defined in the International Management Standards.

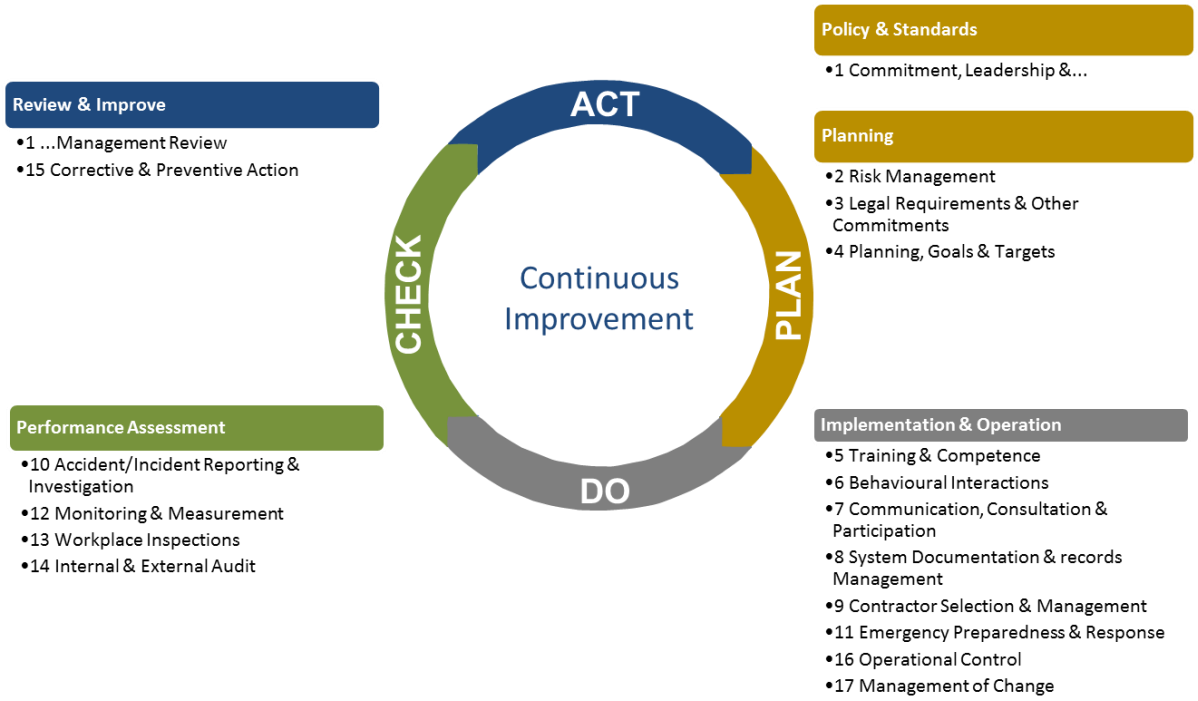


Figure 2. Management system standards forming the APAC IMS continuous improvement PDCA model.

Table 1. Grouping of Standard Clauses

ISO 14001:2004		OHSAS 18001:2007		APAC IMS	
4.1	General Requirements (Heading only)	4.1	General Requirements (Heading only)		
4.2	Environment Policy	4.2	OH&S Policy	IMS 01	Commitment, Leadership and Management Review
4.3	Planning (Heading only)	4.3	Planning (Heading only)		
4.3.1	Environmental Aspects	4.3.1	Hazard Identification, Risk Assessment and Determining Controls	IMS 02 IMS 17	Risk, Management Management of Change
4.3.2	Legal and Other Requirements	4.3.2	Legal and other Requirements	IMS 03	Legal Requirements and Other Commitments
4.3.3	Objectives, Targets and Programme(s)	4.3.3	Objectives and Programme(s)	IMS 04	Planning, Goals and Targets
4.4	Implementation and Operation (Heading only)	4.4	Implementation and Operation (Heading only)		
4.4.1	Resources, Roles, Responsibility and Authority	4.4.1	Resources, Roles, Responsibility, Accountability and Authority	IMS 01	Commitment, Leadership and Management Review
4.4.2	Competence, Training and Awareness	4.4.2	Competence, Training and Awareness	IMS 05 IMS 09	Training Competency and Awareness Business Partner Selection and Management
4.4.3	Communication	4.4.3	Communication, Participation and Consultation	IMS 06 IMS 07	Behaviour and Observation Communication, Consultation and Participation
4.4.4	Documentation	4.4.4	Documentation	IMS 08	Systems Documentation and Records Management
4.4.5	Control of Documents	4.4.5	Control of Documents	IMS 08	Systems Documentation and Records Management
4.4.6	Operational Control	4.4.6	Operational Control	IMS 09 IMS 16 IMS 17	Business Partner Selection and Management Operational Control Management of Change
4.4.7	Emergency Preparedness and Response	4.4.7	Emergency Preparedness and Response	IMS 11	Emergency Preparedness and Response
4.5	Checking (Heading only)	4.5	Checking (Heading only)		
4.5.1	Monitoring and Measurement	4.5.1	Performance Measurement and Monitoring	IMS 12	Monitoring and Measurement
4.5.2	Evaluation of Compliance	4.5.2	Evaluation of Compliance	IMS 13 IMS 14	Workplace Inspections Internal and External Audits
4.5.3	Nonconformity, Corrective Action and Preventive Action	4.5.3	Incident Investigation, Non-conformity, Corrective Action and Preventative Action	IMS 10 IMS 15	Accident/Incident Reporting and Investigation Preventative and Corrective Actions
4.5.4	Control of Records	4.5.4	Control of Records	IMS 08	Systems Documentation and Records Management
4.5.5	Internal Audit	4.5.5	Internal Audit	IMS 14	Internal and External Audits
4.6	Management Review	4.6	Management Review	IMS 01	Commitment, Leadership and Management Review

6. Glossary of Terms

Acceptable risk	Risk that has been reduced to a level that can be tolerated by the organisation having regard to its legal obligations and its own OH&S policy (OHSAS 18001:2007).
Accident	An undesired event, which results in harm to people, damage to property, loss to process, harm to the environment, harm to the communities or loss of reputation.
Accountability	The principle by which individuals, organisations, and the community are required to account to others for their actions. Organisations and their employees must be able to account to appropriate regulatory authorities, to shareholders or members, and to the public to meet statutory obligations, audit requirements, relevant standards and codes of practice, and community expectations.
ALARP (As Low As Reasonably Practicable)	Risk management term which involves balancing reduction in risk against time, trouble, difficulty and cost of achieving it. This level represents the point, objectively assessed, at which the time, trouble, difficulty and cost of further reduction measures become unreasonably disproportionate to the additional risk reduction obtained.
APAC	Asia Pacific Includes operations and facilities in Australia and New Zealand.
APLT	APAC Regional Leadership Team
Audit	Systematic, independent and documented process for obtaining audit evidence and evaluating it objectively obtaining determine the extent to which management system audit criteria set by the organisation are fulfilled (ISO 14001; 2004, 3.14). Note: Independence can be demonstrated by the freedom from responsibility for the activity being audited.
Auditor	A person with the competence to conduct an audit.
Audit Criteria	Policies, practices, procedures or requirements against which the auditor compares collected audit evidence about the subject matter. Note: Requirements may include, but are not limited to, standards, guidelines, specified organisational requirements and legislative or regulatory requirements.
Audit Evidence	Verifiable information, records or statements of fact. Note 1: Audit evidence, which can be qualitative or quantitative, is used by the auditor to determine whether audit criteria are met. Note 2: Audit evidence is typically based on interviews, examination of documents, observation of activities and conditions, existing results of measurements and tests or other means within the scope of the audit.
Audit Finding	Result of the evaluation of the collected audit evidence compared against the agreed audit criteria. Note: The findings provide the basis for the audit report.
Audit Protocol	A systematic and documented verification process of objectively obtaining and evaluating evidence to determine whether the operation's H&S and S&ER management system and level of environmental relations

	performance conforms to the audit criteria set by Newmont Asia Pacific.
Basic Causes	The personal and job factors that permit the substandard actions and conditions to exist.
Business Plan	A management plan established to achieve agreed objectives and targets, developed in conjunction with the budget process and is consistent with the Corporate strategy and APAC policies.
Business Partner	The Party to the Agreement as identified in the Instrument of Agreement that is required to carry out and complete the work.
Certification (ISO 14001 and OHSAS 18001)	External and independent verification process by an accredited third-party confirming that Newmont Asia Pacific's "Environmental Management System" and "Occupational Health and Safety Management System" meet the requirements of these specific international standards, as determined by JAS-ANZ in Australia and New Zealand.
Change	Any administrative, physical, operational or organisational modifications, alterations or substitutions to a system, a process, plant or equipment whether temporary, permanent or for an emergency purpose that is not a Replacement-in-Kind. Change excludes normal repairs to restore the original functionality, state and configuration of equipment or a system utilising identical procedures, resources or components.
Change Management	The systematic process for ensuring changes that impact safety, health, environment, social responsibility and productivity are identified, assessed, managed and appropriately communicated to all affected personnel.
Chronic Medical Condition	Any condition whose symptoms persist for a period of time greater than ninety (90) days immediately after the medically diagnosed recovery period for that condition. This definition excludes hearing loss.
Closure	The process followed when a tailing storage facility and/or mine site has reached the stage in its life cycle where the intended use has been permanently concluded. Generally includes broader issues than decommissioning activities, such as community consultation and employee severance, and is described in a Closure Plan.
Competency	A combination of attributes, such as knowledge, skills, experience, abilities and attitudes underlying some aspect of successful performance.
Compliance Event/Issue	Breach of provincial or national environmental or related legislation, operating licence condition or standards set by statutory approved management plan or other binding documentation, irrespective of severity or frequency (e.g. Notice of Intent, Environmental Impact Assessment, Plan of Operations, Environmental Management Plans, Closure and Reclamation Plans).
Community	The people living in one locality and the locality in which they live. This can be understood at a local or district level, a state or regional level, or a national level.
Continuous Improvement	Recurring process of enhancing the management system in order to achieve improvements in the overall health, safety, environmental and social performance consistent with the organisation's policies.
CIP (Continuous	A detailed plan that drives the completion of a specific objective (s) and includes tasks required to be completed, personnel accountable for

Improvement Plan)	completion of the tasks and target dates for completion (e.g. Risk Mitigation Plan, 3W action plan, CIP, etc.).
Contract	The agreement between the Principal and the Contractor in the form of a standard written contracts department legal document executed by both parties.
Contractor	Person(s) of companies contracted to carry out work for, and on behalf of Newmont Asia Pacific including self-employed persons and sub-contractors. Includes suppliers, vendors and contractors and is stated in a contract.
Contractor Management	In relation to Contractor Management the following personnel are defined below: **Principal** Newmont Mining Services Pty Ltd, or in the case of contracting with a single site, the respective sites name **Principal Representatives** Persons appointed by the Principal to represent the Principal in matters pertaining to the Contract. There are two types: • Technical Representative • Contractor Administrator. **Technical Representative** The appointed person managing the specific contract of work to be conducted. **Contract Administrator** The appointed person to oversee the contractual relationship between the parties, including all variations to the contract from the Global Chain Management Department. **Contractor Representative** The Contractor Representative is a person appointed by the Contractor to: • Have the power to bind the Contractor in respect of all matters pertaining to the Contract; • Provide technical advice to the Principal; • Table details supporting the Contractor's performance against agreed KPI criteria; and • Communicate, discuss and resolve Contract issues on behalf of the Contractor. **Department Representatives** Appointed representatives from H&S, S&ER or other departments working with the Contract Administrator, Technical Representative and Contractor Representative to provide guidance and technical support on aspects of the contracted work, and ensure the S&ER and H&S risks are adequately addressed and managed in accordance with the APAC IMS Standards.
Consequence	The maximum reasonable outcome or impact of an event expressed qualitatively or quantitatively.
Control	Barriers that are put in place to reduce the likelihood of an event.
Corrective Action	Action to eliminate the cause of a detected nonconformity or other undesirable situation.
Critical Control	A control that is crucial to preventing the event or mitigating the consequences of the event. The absence or failure of a critical control would significantly increase the risk despite the existence of the other

	controls. In addition, a control that prevents more than one unwanted event or mitigates more than one consequence is normally classified as critical.
Current risk	The risk associated with an unwanted event after consideration of the existing controls.
Document	Structured units of recorded information, published or unpublished, in hard copy or electronic form, and managed as discrete units of information systems. Information and its supporting medium (which can be paper, magnetic, electronic, optical computer disc, photograph or master sample, or a combination thereof). A document becomes a 'record' when it provides evidence of a business transaction or stating results achieved or providing evidence of activities performed.
Document Control	Process applied to all management system documents to enable them to be effectively managed and updated. Only documents "that can be updated" need to be held under document control. Control of documents required by the ISO/OHSAS Standards, by the APAC IMS, and by Newmont's Technical and Discipline Specific Standards.
Document Management	Document management (or control) involves approval for adequacy prior to use, review and update and re-approval, ensuring identification of changes and current revision status, ensuring relevant version(s) is available at points of use, ensuring documents are legible and readily identifiable, ensuring documents of external origin are identified and their distribution controlled, prevent the unintended use of obsolete documents and applying suitable identification to them if they are retained for any purpose.
Due Diligence	Systematic, comprehensive and demonstrable approach to the management of issues, which is based on an assessment of the likely risks and potential legal liabilities arising from the business, and is reasonably designed and operated to control and reduce those risks and prevent those liabilities from being incurred.
Emergency Response	Actions taken at the site of a significant accident, to preserve lives, the environment and property, including the management of these actions.
Emergency Response Plan	Comprehensive document that plans for probable emergencies which could occur at each site and appropriate responses to take in the event that such an emergency takes place.
Employee	Person who works for Newmont under a contract of employment, including apprenticeship or traineeship.
Environment	Surroundings in which an organisation operates, including air, water, land, natural resources, flora, fauna, humans and their interrelation (including artefacts, culturally significant sites, and social aspects). Note: Surroundings in this context extend from within an organisation to the global system.
Environmental Aspect	See the definition for Hazard.

Environmental Impact	Any change to the environment whether adverse or beneficial, wholly or partially resulting from an organisations environmental aspect(s).
Environmental performance	Measurable results of an organisations management of environmental aspects. Note: in the context of environmental management systems, results can be measured against the organisation's environmental policy, objectives, targets, and other performance requirements.
S&ER	Sustainability and External Relations
Event	Occurrence or change of a particular set of circumstances NOTE 1: An event can be one or more occurrences, and can have several causes. NOTE 2: An event can consist of something not happening. NOTE 3: An event can sometimes be referred to as an "incident" or "accident". NOTE 4: An event without consequences can also be referred to as a "near miss", "incident", "near hit" or "close call".
Exposure Hours	The facility's best estimate of the total number of hours worked at the operation or apportion of the operation. Contractors and vendors who are regularly exposed to mine hazards should be counted. Contractor and vendor hours should be tracked separately from company employee hours. The following guidelines should be followed: 1. Management salaried employees should be estimated at 40 hours per week; 2. An additional 3% of the total hours for the month should be added to the exposure hours for vendors and suppliers. 3. Estimates for hourly employees should be for actual hours worked, not the number of hours for which the employee was paid. 4. Paid vacation time should not be counted as exposure hours.
Facility	An entity that forms part of Newmont APAC but is not an operation (e.g. Perth office, closure sites, non-operating sites, power stations, ports etc).
Fatality Risk	Risk that could result in single or multiple fatalities through a safety incident in the workplace.
First Aid Injury	Any work-related injury that does not require medical attention. This would include one-time treatment and subsequent observation of minor cuts, scratches, burns, strains etc.
Formal	Documented, current, relevant and verifiable.
Foreseeable Annual Loss (FAL)	An estimated measure of risk in dollars per year. Calculated by multiplying the loss value in dollars of an accident event, by the frequency of that accident event. Aims of the FAL are to: 1. Estimate the potential financial impact on the business; 2. Provide a better ranking of risks from the risk matrix ranking; 3. Show the potential benefit of risk treatment action plans and prioritise these in terms of cost effectiveness.
Frequency	A measure of the number of occurrences per unit of time.

GM	General Manager
Guideline	An explanation to guide in the application of a part of the IMS Standards or Regional Procedure(s) to assist in determining a course of action. A supporting document in the IMS.
Harm	Physical injury or damage to health, property, the environment or Newmont's reputation.
Hazard	Source, situation, or act with a potential for harm in terms of human injury or ill health, or a combination of these(OHSAS 18001:2007). Environmental Aspect is often referenced for environmental hazards - element of an organisation's activities or products or services that can interact with the environment (ISO 14001: 2004).
Hazard identification	Process of recognising that a hazard exists and defining its characteristics.
Hierarchy of Controls	A sequence of options which offer a number of ways to approach the hazard control process and to mitigate risk (e.g. Elimination, Substitution, Engineering, Administrative, Personal Protective Equipment).
H&S	Health and Safety
Human Rights	Fundamental principles allowing individuals freedom to lead a dignified life, freedom from abuse and violations and freedom to express independent beliefs.
Ill health	Identifiable, adverse physical or mental condition arising from and/or made worse by a work activity and/or work related situation (OHSAS 18001:2007).
Improvement Plan	See Continuous Improvement Plan.
IMS	Integrated Management System - specifically in relation to S&ER and H&S management systems.
Incident	An undesired event, which under slightly different circumstances, *could have* resulted in harm to people, damage to property, loss to process, harm to the environment, harm to community, or loss of reputation. A near miss.
Indigenous People	Two-part definition from United Nations ILO169, Indigenous and Tribal Peoples Convention, 1989: 1. Peoples in independent countries whose social, cultural and economic conditions distinguish them from other sections of the national community, and whose status is regulated wholly or partially by their own customs or traditions or by special laws or regulations. 2. Peoples in independent countries who are regarded as Indigenous on account of their descent from the populations which inhabited the country, or a geographical region to which the country belongs at the time of conquest or colonization or the establishment of present state boundaries and who, irrespective of their legal status, retain some or all of their own social, economic, cultural and political institutions.

Inspection	A formal examination of a workplace. A detailed checklist should be used and a report generated identifying compliance (and non-compliance) with legal requirements or specific standards. **Pre-Work Workplace Inspections** – Inspections of the work area before commencing work, conducted by a competent person. **Planned General Inspections** – A thorough, deliberate inspection of an assigned area in which the inspector takes the time to look at the 'off-the-floor' and out-of-the way places that are not looked at during normal daily activities. **Follow-Up Inspections** –Conducted to make sure that all items noted in an earlier inspection has been adequately and properly addressed.
Interaction	A conversation specifically about safety and health which occurs between a line manager and an operator (or small group of operators) at the work place. The conversation allows the line manager to understand the work being undertaken and the safety controls which are in place to eliminate the risk of harm. It is also an opportunity for the manager to lead a conversation with the operator/s to collectively identify good practices and/or opportunities for improvement with the planning and execution of the work and to reinforce positives and seek commitment to correct opportunities in behaviours or conditions for the workplace.
IMS Coordinator/Champion	A nominated person responsible for overseeing, evaluating, reviewing and developing the APAC Integrated Management System. This can be a standalone function or a component of someone's work.
Interested party	Person or group, inside or outside the workplace, concerned with or affected by the OH&S performance and/or environmental performance of an organisation. See also Stakeholder.
ISO 14001:2004	International (Australian/New Zealand) Standard specifying requirements for an environmental management system to enable an organisation to develop and implement a policy and objectives which take into account legal requirements and other requirements to which the organisation subscribes, and information about significant environmental aspects.
JAS-ANZ	Joint Accreditation Society of Australia and New Zealand. Accreditation body that grants certification rights to capable organisations to grant external third party certification to agreed international standards.
Job Hazard Analysis (JHA)	A formal risk assessment method to identify, analyse and determine the most practical way of managing hazards associated with a specific job. Should be used for planning a "one-off job" or developing a Standard Operating Procedure.
Key Performance Indicator (KPI)	Financial and non-financial metrics used to help an organisation define and measure progress toward organisational objectives defined in the business/strategic plan.
Layered Audit	The Layered Audit process is a field leadership tool designed to review implementation of, and compliance with, established procedures set standards identify systems issues and opportunities, and recognise and reinforce positive performance in specific component parts of our H&S Fatality Risk Management processes.

Likelihood	Used as a qualitative description of probability or frequency.
Line Management	Management with direct responsibility and accountability for all aspects of activities, operations, products and services, including environmental/external relations.
Loss	Damage to physical assets, employees, reduction in earnings and/or not achieving a gain due to risk aversion.
Lost Time Injury Frequency Rate (LTIFR)	The number of lost time injuries/illnesses times by 200,000 and divided by the total number of exposure hours.
Lost Time Injury (LTI)	All work-related injuries and illnesses where the employee cannot work the next regularly scheduled shift.
Management Operating System (MOS)	The management processes, metrics, systems and tools that enable leadership to drive the PDCA cycle at all organisational levels and all time horizons. A business process driven approach that seeks to: • Define the management practices for routine operations management; • Integrates the Plan-Do-Check-Act cycle as the basis of continuous improvement; • Define performance measures and goals tuned to the role and the plan; and • Standardise the way we operate aligned with best practice models built on the back of the 2009 Scoping Study.
Management Plan	A management plan is a key operational control document for a defined risk or series of related risks. The management plan includes details for addressing risks including but not limited to roles and responsibilities, objectives, targets, monitoring and review.
Management Review	Formal review process of the IMS to ensure its continuing suitability, adequacy and effectiveness.
Management System	Organisational structure, responsibilities, policies, practices, procedures, processes and resources for implementing and maintaining Newmont APAC H&S, Environment, Social Responsibility, and Business Statements of Commitment.
Medical Treatment Injury (MTI)	Any work related injury or illness that requires treatment by a licenced medical professional that does not result in lost time or restricted duty but is beyond first aid. This would include surgery, treatment of infections, applications of antiseptics during follow-up visits, treatment of second and third degree burns, applications of sutures, removal of foreign bodies from wounds, application of hot or cold therapy for follow-up visits, positive x-rays diagnosing fractures (including hairline fractures), broken teeth, trauma, loss of consciousness, noise induced hearing loss, etc.
Monitoring	The gathering, analysis (especially for trends) and interpretation of information for the assessment of performance. Examples include occupational health, air, soil and water quality, greenhouse gas emissions, flora and fauna, rehabilitation, social aspects including, complaints, operational dust, noise, vibration, property damage,

	community health, community investment, historical and cultural sites. Monitoring may be continuous, short-term or long term and may be undertaken manually or automated.
NMC	Newmont Mining Corporation.
Non-compliance	Any breaches of an external requirement including provincial, local, state or national H&S and S&ER or related legislation, regulations, operating licence condition or Standards set by statutorily approved management plan or other binding documentation, irrespective of severity or frequency (e.g. Notice of Intent, Environmental Impact Assessment, Plan of Operations, Environmental Management Plans, Closure and Reclamation Plans).
Non-conformance	Non-fulfilment of a requirement.
Objective	Overall H&S/S&ER goals, consistent with the H&S/S&ER Policies, that an organisation sets itself to achieve, and which is quantified where practicable.
Occupational Health and Safety (OH&S)	Conditions and factors that affect, or could affect, the health and safety of employees or other workers (including temporary workers and contractor personnel), visitors, or any other person in the workplace (OHSAS 18001:2007).
OHSAS 18001:2007	Occupational Health & Safety Management Systems Standard – an international Standard created via a concerted effort from a number of the world's leading national standards bodies, certification bodies, and specialist consultancies. The Standard specifies requirements for an occupational health and safety management system to enable an organisation to control its OH&S risks and improve OH&S performance.
Operation	Operations controlled at a mine site.
Operations Management Team (OMT)	An operation based team including the most senior person from each department and the General Manager (GM). Also called an SLT – Site Leadership Team.
Opportunity	A situation that adds or protects value as Newmont attempts to meet its objectives.
Organisation	Company, corporation, firm, enterprise, authority or institution or part or combination thereof, whether incorporated or not, public or private, that has its own functions and administration (ISO 14001:2004). Note: For organisations with more than one operating unit, a single operating unit may be defined as an organisation.
Performance	Measurable results of the organisation's management system, related to the organisation's control of its significant H&S and S&ER risks. Note: In the context of the IMS results can be measured against the organisation's H&S and S&ER policies, objectives, targets and other performance requirements.
Permanent Disability	An injury which impairs the physical and/or mental ability of a person to perform his/her normal work or non-occupational activities for the

	remainder of his/her life.
Permanent Disfigurement	An injury that leads to the appearance of a person being deeply and persistently harmed medically.
Personnel	Employees and contractors
Policy	Statement by the organisation of its intentions and principles in relation to its overall performance which provided a framework for action and for the setting of its objectives and targets.
Preventative Action	Action to eliminate the cause of a potential nonconformity or other undesirable potential situation.
Prevention of pollution	Use of processes, practices, techniques, materials, products, services or energy to avoid, reduce or control (separately or in combination) the creation, emission or discharge of any type of pollutant or waste, in order to reduce environmental impacts (ISO 14001;2004). Note: Prevention of pollution can include source reduction or elimination, process, product or service changes, efficient use of resources, material and energy substitution, reuse, recovery, recycling, reclamation and treatment.
Procedure	A specified way to carry out an activity or a process. Procedures can be documented or not. A **Standard Operating Procedure (SOP)** is an established procedure to be followed routinely in carrying out a given operation or in a given situation. A **Standard Task Procedure (STP)** is an established way of conducting a specific task e.g. using a machine.
Qualitative Health Assessments	A method for determining what a worker could potentially be exposed to and the likelihood of the exposure based on information and judgment. Usually performed through a work place inspection and employee interviews.
Quantitative Health Assessments	A process of assessing an employee's overall exposure to agent(s) by collecting and analysing samples.
Rapid Response System	A Newmont web based system that aims to mitigate and prevent the escalation of adverse consequences in the event that existing risk management controls fail. It provides a Corporate-wide common and tested procedure that will allow an appropriate response to any circumstance, in any geographic location, in a predictable and measurable manner.
Record	Document stating results achieved or providing evidence of activities performed. A record of "evidence", that cannot be changed or up-dated and shall be stored and maintained to be readily identifiable, retrievable and protected.
Records Management	Establishing and maintaining necessary records to demonstrate conformity to the Newmont's, the APAC IMS, legal and other requirements (including ISO/OHSAS Standards). Procedures are required for the identification, storage, protection, retrieval, retention and disposal of records. Records must be legible, identifiable and

	traceable.
Reference	Identity of a source of more detailed information.
Total Reportable Injury (TRI)	A lost time, restricted work or medical treatment injury.
Residual Risk	The risk associated with an unwanted event after consideration of both the current (existing) and future (additional) controls.
Restricted Work Injury (RWI)	An injury that prevents a worker from performing one or more of their routine job functions, or from working the full workday that he or she would otherwise have been scheduled to work. Routine functions are those work activities that the employee regularly performs at least once per week or swing.
Risk	Any event that could prevent an entity from achieving its objectives, or result in a potential impact. Risk is measured in terms of a combination of the consequence of a specific event and the likelihood of it occurring. Risk = Consequence x Likelihood.
Risk Assessment	Process of evaluating risk arising from a hazard(s), taking into account the adequacy of any existing controls, and deciding whether or not the risk(s) is acceptable (OHSAS 18001:2007).
Risk Assessment Methods	**FMEA** - Failure Mode and Effects Analysis: Methodology used to analyze potential failure modes within a specific (financial, technical) process or facility. **FTA** - Fault Tree Analysis: A systems engineering methodology for representing the logical combinations of various operating or business systems and possible causes which can contribute to an event. **HAZOP** - Hazard and Operability: A systematic review of every part of the facility or process to discover how deviations from the intention of the design can occur, and to decide whether these deviations can lead to hazardous or operability problems. **OMAT** - Operability and Maintainability Analysis Technique: A qualitative risk assessment tool to evaluate the human factor elements in how a task is performed. **PHA** - Preliminary Hazard Analysis: Is a structured review technique to identify, analyze and rank hazards. **SQRA** - Semi-Quantitative Risk Assessment. Analyses the causal pathways of a risk and helps to select appropriate controls for each pathway.
Risk Control	Identification of policies, standards, procedures, behavioural and physical changes to eliminate or minimise risk.
Risk Management	The culture and processes directed towards the effective management of risk (adverse effects) and opportunities (positive risk).
Risk Management Process	The systematic application of management policies, procedures and practices to the tasks of identifying, analysing, evaluating, treating and monitoring risks and identifying and maximising potential opportunities.
Risk & Opportunity Register	A comprehensive listing of the associated risk and opportunity records.

Risk Treatment Status Report	A form of Continuous Improvement Plan that documents information associated with significant risks. This includes a description of the risk, current and target risk ranking and future controls.
Risk Reduction	Actions taken to lessen the likelihood, negative consequences, or both, associated with risk.
Risk Treatment	Selection and implementation of appropriate options for dealing with risk.
Root Cause Analysis	Technique used to determine the elemental cause of an event.
RWI	Restricted Work Injury
Scope	Defines the boundaries within which the IMS applies. It includes the area covered by the operation or activity, and/or in which the operation or activity has influence or control.
Serious Injury	A work related injury resulting in: ○ Loss of consciousness requiring hospitalization; ○ Permanent loss of function and/or permanent disability (see definition), ○ Loss of part or all of a limb (for injuries involving fingers or toes, this would be the loss of a digit or more); ○ Permanent disfigurement (see definition); or ○ Chronic long-term health effects (see definition for Chronic medical condition).
Severity Rate	The number of days lost plus the number of days of restricted duty times by 200,000 and divided by the total number of exposure hours. Interchangeable with Severity Measure.
Significant Risk	A risk currently assessed as extreme or high on the risk matrix.
Social Impact Assessment (SIA)	A process for assessing the social issues and impacts arising from the operation or facilities presence for the whole lifecycle of the operation/facility.
SPE	Significant Potential Event. Any near miss or undesired event involving an uncontrolled release of energy that has the potential for a maximum reasonable consequence of a single or multiple fatality, or irreversible health effects.
S&ER	Sustainability and External Relations.
Stakeholder	An individual or group who is impacted by the operation or facility, or can have an impact on the operation or facility. An internal stakeholder is someone who is a Newmont employee or contractor.
Stakeholder Engagement	Where stakeholders are sought out and where appropriate, involved in joint decision-making and jointly finding solutions.
Stakeholder Mapping	A process followed after all stakeholders have been identified. The process involves drawing a map of stakeholder groups and working out the

	links between them in order to determine who the key influence makers are. The process will assist in identifying who impacts the operation positively and negatively. Refer to Newmont Corporate Social Responsibility Standards.
Statement of Commitment	Regional or operation specific document, aligned with Corporate Policies to highlight regional specific areas of focus.
Strategic Plan	A long-term plan (e.g. three years) that sets the overall direction of the organisation with respect to the H&S, S&ER and Business planning. Systematic process of envisioning a desired future, and translating this vision into broadly defined goals or objectives and a sequence of steps to achieve them.
Sub-standard Acts and Conditions	As defined in the H&S Loss and Causation Model, include acts such as; improper operation, inadequate training, use of defective equipment, failure to use caution, failure to wear PPE, exposure to hazards, horseplay and use of drugs and alcohol.
Supply Chain Management (SCM)	Supply Chain Management department covers purchasing of goods and services, contract administration, inventory and logistics management.
Supporting Documents	Guidance provided by Newmont in relation to a standard. This guidance is not mandatory but includes acceptable practices within Newmont on how to manage the requirements of a standard.
Sustainable Development	Development that meets the needs of the present without compromising the ability of future generations to meet their own needs (The Brundtland Report, 1987). In the mining and metals sector, this means that investments should be financially profitable, technically appropriate, environmentally sound and socially responsible" (International Council on Mining and Metals). Newmont has a commitment to international initiatives such as the International Council on Mining and Metals' Sustainable Development Framework and the United Nations Global Compact. Newmont's approach to sustainability is focused in striving to achieve industry leading environmental performance and by creating shared value with the communities that host our operations (Beyond the Mine, 2011).
Tactical Planning	A systematic determination and scheduling of the immediate or short-term (<1yr) activities required in achieving the objectives of strategic planning.
Target	Detailed performance requirement quantified where practicable, applicable to the organisation, that arises from the H&S and S&ER objectives and that needs to be set and met in order to achieve those objectives.
Training	Organised activity aimed at imparting information and/or instructions to improve a person's performance or to enable attainment of a required level of knowledge or skill(s).
3W	An Action Plan containing prompts for **What** needs to be done, **Who** will do it, and by **When**.
Workplace	Any physical location in which work related activities are performed under the control of the organisation (OHSAS 18001:2007). Note: When giving consideration to what constitutes a workplace, the organisation should take into account the OH&S effects on personnel who

are, for example, travelling or in transit (e.g. driving, flying, on boats or trains), working at the premises of a client or customer, or working at home.

Standard 1 Commitment, Leadership and Management Review

1. Intent

To ensure all Newmont APAC employees and business partners demonstrate visible and consistent leadership in health and safety (H&S), sustainability and external relations (S&ER) and a visible commitment to the Statements of Commitment and Standards of the Company.

To ensure relevant Integrated Management System (IMS) documentation (including Statements of Commitment, Standards and Regional Procedures) are reviewed periodically to ensure they remain effective, widely used, are communicated and sustain a continuous improvement environment.

2. Requirements

2.1 Approach

The APAC Regional Senior Vice President (RSVP), on behalf of the Asia Pacific Leadership Team (APLT) will endorse the Region's Environment, Social Responsibility and Health and Safety Statements of Commitment. These Statements of Commitment define Newmont APACs commitment to demonstrating visible leadership in health and safety, stewardship of the environment and social responsibility and support the businesses IMS.

The APLT, operations and facilities management teams will ensure the availability of resources essential to establish, implement, maintain and improve the IMS. This will be achieved by the following:

- Ensuring that the Regional Senior Vice President and leadership roles are aware of their H&S and S&ER accountabilities and responsibilities.
- Acknowledging that H&S and S&ER outcomes are a line management responsibility, supported by H&S and S&ER personnel and relevant committees.
- Requiring personnel to accept responsibility for their H&S and S&ER compliance obligations and management of potential impacts of their work activities.
- Developing and communicating the APAC IMS Roles and Responsibilities.
- Including H&S and S&ER targets and objectives, as stated in the strategic or business plan, in relevant personnel's annual objectives.
- Conducting annual performance appraisals to evaluate individual performance against defined H&S and S&ER objectives.
- Setting annual Key Performance Indicators (KPI) that are in line with company strategic and business plans, and are included in the Regional Incentive Programme.

2.2 Deployment

APLT and Operation / Facility Leadership Teams will commit the required personnel and financial resources to establish, implement, maintain and continually improve the IMS and supporting documents and processes at a regional and facility / operational level.

Operation / Facility Management Teams will ensure the on-going conformance with the IMS Standards, supporting Guidelines and other system documentation through appropriate review and alignment of objectives to the Statements of Commitment and the IMS.

2.3 Review

The APLT will undertake a review of H&S and S&ER Statements of Commitment annually or whenever a change occurs, to ensure they are relevant and upheld by the business and updated as required. Relevant leaders will sign off the Statements of Commitment in the business.

Management reviews will be carried out at a minimum of twice yearly at the regional level and quarterly intervals at an operational level. These reviews will be undertaken to ensure areas of improvement are identified and acted on, and areas of leading practice are supported, sponsored and shared throughout the business.

These reviews will be undertaken by the APLT and the Operation / Facility leadership teams and include all relevant operational line managers and S&ER and H&S technical leaders. Outcomes will be documented and made available for communication and consultation.

The Action Management System will be used to track the completion of actions from these reviews, and periodic assessments will be undertaken to ensure the actions have been closed out in accordance with IMS Standard 15.

3. Accountability

Role	Action
Standard Owner/Champion – Regional Senior Vice President	• Ensure processes are in place and functioning to demonstrate conformance to the standard.
APLT	• Review and endorse IMS Standard 1 and relevant Statements of Commitment. • Define H&S and S&ER accountabilities and responsibilities. • Allocate necessary resources.
Operation/Facility Leadership Teams	• Define Site H&S and S&ER accountabilities and responsibilities. • Allocate necessary resources. • Participate in IMS reviews.
Line Leadership Roles – Newmont and Business Partner Leaders	• Visible leadership and demonstrated commitment to IMS. • Define H&S and S&ER roles, responsibilities, objectives and measure performance.
Functional H&S and S&ER Leads	• Advise on effective demonstration of visible commitment and leadership to the APAC IMS. • Prepare necessary information for management review. • Provide leadership in the review of IMS documents.
All Employees and Business Partners	• Understand role and H&S and S&ER obligations. • Participate in necessary training.

ISO/OHSAS, APAC IMS Reference
ISO 14001:2004 - 4.2 Environmental Policy, 4.4.1 Resources, Roles, Responsibility and Authority, 4.6 Management Review
OHSAS 18001:2007 - 4.2 OH&S Policy, 4.4.1 Resources, Roles, Responsibility, Accountability and Authority, 4.6 Management Review
APAC IMS Regional Procedure - NAP-IMS-PR-70-15490 Commitment, Leadership and Management Review Regional Procedure

Standard 2 Risk Management

1. Intent

To maximise gains and minimise losses through coordinated risk management activities that direct and control the organisation with regards to risk. To ensure hazards are systematically identified and associated risks are evaluated and managed. This standard covers all Risk Management activities in the business including HSLP and S&ER risks.

2. Requirements

2.1 Approach

All Newmont APAC operations and facilities will adopt consistent frameworks and processes to systematically identify hazards and manage risks. This includes the identification and management of potential opportunities.

Newmont APAC will utilise risk management processes that:

- establish context;
- identify risks;
- analyse risks;
- evaluate risks;
- treat risks;
- provides for consultation with relevant stakeholders; and
- undertakes verification through a monitoring / reviewing process.

All Newmont APAC operations and facilities will manage risk on all levels and within each area of the business. Management of these risks will be undertaken using one, or a combination of the following:

1. Hazard Identification and Reporting.
2. Pre-task risk assessment (SafeCheck).
3. Job Hazard Analysis (JHA).
4. Formal Risk Assessments that are linked to the site risk registers and continuous improvement plans.
5. Opportunity Management Process to ensure that risk management activities also focus on outcomes beyond negative risk issues (unwanted events), i.e. opportunities (positive risk).

The processes will be conducted utilising the methodologies detailed in the supporting Regional Procedure and this will ensure that Newmont personnel and business partners are actively identifying and managing risk to more constantly deliver upon business objectives.

2.2 Deployment

Risk management processes will be deployed on all APAC operations and facilities and will be reviewed and verified in accordance with the supporting Regional Procedure. It is a requirement that systematic identification and management of hazards and risks be undertaken at all levels of activity utilising the relevant and applicable risk management tool and process. Where Formal Risk Assessments are undertaken these will be linked to Site Risk Registers and will be facilitated by appropriately trained personnel.

Where significant risks have been identified the Operational/Facility Leadership Team will control the determination of acceptable risk levels.

All control measures that are implemented to address risk will consider and be consistent with IMS Standard 16 Operational Control.

2.3 Review

Risks that have been entered into a Risk Register will be reviewed on a periodic basis, or following a significant incident or change. Formal review of the Risk Registers will be conducted annually and will be taken into consideration for the setting of HSLP and S&ER objectives and targets and the development of Continuous Improvement Plans.

The risks constituting the top layer of an operations or facility risk profile will be reviewed and reported on a quarterly basis according to the Risk Management Regional Procedure. These risks will also have Critical Controls identified, and verification of their adequacy and effectiveness will be undertaken as part of the quarterly reviews.

3. Accountability

Role	Action
Standard Owner/Champion – General Manager Operations Services	• Ensure processes are in place and functioning to demonstrate conformance to the standard.
APLT	• Review and endorse IMS Standard 2. • Sponsor Risk Management within APAC. • Annual monitoring of the Risk Management Process. • Communicate the Region's Significant Risks to Newmont Mining Corporation. • Allocate resources. • Review top risks on a regular frequency.
Operation / Facility Leadership Teams	• Sponsor Risk Management at Operation/Facility level. • Annual monitoring of the Risk Management Process. • Communicate the Operation/Facility Significant Risks to APLT. • Provide adequate resources to effectively manage unacceptable risks. • Clearly outline and communicate accountabilities in relation to risk management on site.
Line Leadership Roles – Newmont and Business Partner Leaders	• Formally review Significant Risks for the operation or function annually. • Review the status of Significant Risks and action plans during quarterly reviews. • Promote awareness through the introduction of Risk Management objectives
Functional HSLP and S&ER Leads	• Lead the regional risk management programme according to discipline. • Develop and manage the regional framework for operational risk management within APAC. • Provide assistance and mentoring to personnel responsible for Risk Management. • Provide advice, assistance and resources to facilitate HSLP and S&ER risk management activities. • Undertake review and analysis of Significant HSLP and S&ER Risks for the region.
All Employees and Business Partner	• Actively identify and manage hazards and risks in the work area on an on-going basis. • Participate in relevant training to ensure understanding and effective application of basic risk management principles in the work area.

ISO/OHSAS, APAC IMS Reference
ISO 14001:2004 - 4.3.1 Environmental Aspects
OHSAS 18001:2007 - 4.3.1 Hazard Identification, Risk Assessment and Determining Controls
AS/NZS ISO 31000:2009 – Risk Management – Principles and Guidelines
APAC IMS Regional Procedure – NAP-IMS-PR-70-15317 Risk Management Regional Procedure

Standard 3 Legal Requirements and Other Commitments

1. Intent

To ensure that the relevant HSLP and S&ER statutory and voluntary commitments which apply to Newmont APAC Operations and Facilities are identified, complied with and communicated to relevant stakeholders.

2. Requirements

2.1 Approach

Newmont APAC will establish, implement and maintain procedure(s) as part of its integrated management system to:

- Identify the applicable HSLP and S&ER legal requirements that apply to our operations as well as any voluntary commitments.
- Establish formal processes to routinely review legal requirements and voluntary commitments and update the database.
- Communicate updates to relevant stakeholders who will assess what changes (if any) are required to supporting documentation such as management plans, standard operating procedures and guidelines etc.

Newmont APAC will ensure that process(s) used to identify, document and review legal requirements and voluntary commitments will include:

- The implementation and maintenance of systems which details the following:
  - Relevant Federal, State and local legislation and regulations (**legal requirements**).
  - Conditions related to HSLP and S&ER permits, licenses and certification.
  - Expiry and/or renewal dates.
  - Global and APAC Regional voluntary commitments relating to HSLP and S&ER (**voluntary commitments**).
- Communication of relevant information on legal and voluntary commitments, including changes to legal requirements to relevant stakeholders.

2.2 Deployment

Legal requirements and voluntary commitments applicable to all APAC operations and facilities will be communicated, managed, monitored and maintained in a manner consistent with the Legal Requirements and Other Commitments Regional Procedure.

2.3 Review

Newmont will undertake legal compliance audits at a minimum of every 3 years at all of its operations in accordance with the Internal & External Audits Regional Procedure. Legal compliance audits will be carried out by an internal/external preferred provider operating under Legal Privilege and commissioned by the APAC Regional Legal Team.

The APLT will be provided with legal advice based on the legal compliance audits and will oversee any plans established to correct identified opportunities.

The systems established under this standard will be reviewed annually for accuracy.

3. Accountability

Role	Action
Standard Owner/Champion – Group Executive Legal	• Ensure processes are in place and functioning to demonstrate conformance to the standard. • Review and endorse IMS Standard 3.
APLT	• Review and endorse IMS Standard 3. • Provide resources to manage legal issues which may impact on the APAC region. • Monitor close out of actions identified in legal compliance audits. • Allocate resources to meet operations legal requirements and voluntary commitments.
Operation / Facilities Leadership Teams	• Monitor close out of actions identified in legal compliance audits or related to non compliance with legal requirements or voluntary commitments. • Monitor the implementation associated with changes to legal requirements and voluntary commitments. • Report, or allocate responsibility for reporting of legal non-compliances to the relevant government authorities. • Allocate resources to meet operations legal requirements and voluntary commitments.
Line Leadership Roles – Newmont and Business Partners Leaders	• Understand legal obligations of own and subordinates' roles. • Be familiar with and ensure compliance with applicable licences, permits and agreements. • Report HSLP and S&ER non compliance with legal requirements and voluntary commitments to HSLP and S&ER leads on Site. • Monitoring changes in legal requirements and voluntary commitments to ensure change management plans are implemented in their area of responsibility.
Functional HSLP and ESR Leads	• Communicate Newmont APAC HSLP and S&ER legal requirements and voluntary commitments to operations. • Review and manage changes in Safety, Health and Environmental legislation.
Land Administration Management Team	• Coordinate annual reviews of the Legal Requirements and Other Commitments systems. • A regional point of contact between site and Environment Essentials. • Coordinate training for Environment Essential system as required. • Maintain and update personnel distribution list from Environment Essentials.
Site HSLP / S&ER Team	• A site point of contact between site personnel and the regional legal requirements and voluntary commitments systems coordinator. • Ensure relevant registers are kept up to date • Ensure that all relevant site personnel receive scheduled legislation updates from the preferred service provider.
All Employees and Business Partners	• Understand role and its HSLP and S&ER obligations. • Participate in necessary training. • Conduct work in compliance with legal requirements and voluntary commitments.

ISO/OHSAS, APAC IMS Reference
ISO 14001:2004 - 4.3.2 Legal and Other Requirements
OHSAS 18001:2007 - 4.3.2 Legal and Other Requirements
APAC IMS Regional Procedures – NAP-IMS-PR-70-15876 Legal Requirements and Other Commitments Regional Procedure and NAP-IMS-PR-70-15557 Internal and External Audits Regional Procedure

Standard 4 Planning, Goals and Targets

1. Intent

To provide a framework of business planning that ensures Newmont APAC operations and facilities are aligned to Newmont Mining Corporation (NMC) Global and Region objectives. Also to ensure the Business planning and budget cycle contribute to the development of plans to achieve improved business, individual, ESR and HSLP performance.

2. Requirements

2.1 Approach

Newmont APAC is required to develop a strategic plan for all business activities which clearly describes the future state. Senior management teams will ensure appropriate resources are available to deliver on all aspects of the plan, including HSLP and ESR commitments. The plan will establish the necessary objectives and targets and will cascade these into Annual Business Plans for all operation/facilities and functions.

The Newmont APAC approach and process for the development of plans, goals and targets will be consistent with the supporting documentation and will ensure that as a minimum:

- APLT develops and monitors compliance with a strategic business plan that is aligned to the NMC strategic plan.
- APAC operations and facilities develop and maintain an annual business plan.
- Functions, including HSLP and ESR provide guidance on APAC objectives, targets and KPI's in relation to their area of responsibility.
- Reporting of performance against plan is undertaken on a regular frequency.

Newmont APAC operations and facilities will establish, implement and maintain a programme for achieving its objectives. The programme will include as a minimum:

a) who is accountable for achieving stated objectives;
b) what the outcome should be; and
c) the time-frame for completion of the task/s.

Strategic and Business Plans will be reviewed at quarterly and monthly intervals respectively to confirm performance against plan. When necessary improvement plans shall be developed to ensure that deviations from these plans are identified and corrected as soon as practicable.

2.2 Deployment

All Newmont APAC operations and facilities will develop annual business plans and targets in accordance with the requirements of the supporting documentation.

Where significant deviations in achieving planned objectives and/or targets exist the Operation / Facility Management Team will ensure that improvement plans are initiated or reviewed.

2.3 Review

Performance against the Regional Strategic Plan will be reviewed by the APLT on regular frequency with a detailed review being undertaken at least quarterly. Deficiencies or non- conformances identified will be documented, allocated to appropriate functions or individuals and tracked in future meetings.

Operation and facilities management teams will review the Site Annual Business Plan on at least a monthly.

Outcomes of quarterly and monthly reviews and improvement plan reviews will be communicated in accordance with IMS Standard 7 Communication, Consultation and Participation.

3. Accountability

Role	Action
Standard Owner/Champion – Group Executive: Business	• Ensure processes are in place and functioning to demonstrate conformance to the standard.
APLT	• Review and endorse IMS Standard 4. • Develop, approve and maintain the Strategic Business Plan. • Review and monitor Regional performance against KPI's. Develop correction action plans where deviations are identified. • Communicate HSLP and ESR Strategic Plans. • Commit the required staff and financial resources to establish, implement, maintain and continuously improve the planning process.
Operation/Facility Leadership Teams	• Develop, approve and maintain the Site Business Plan. • Review and monitor Site performance against KPI's. • Communicate HSLP and ESR Plans. • Review and monitor Regional performance against KPI's. Control plans where deviations are identified. • Commit the required staff and financial resources to establish, implement, and maintain the planning process.
Line Leadership Roles – Newmont and Business Partners Leaders	• Establish measurable objectives and targets based on the annual business plan. • Ensure that HSLP and ESR targets include both proactive (lead) and reactive (lag) measures. • Develop plans to achieve objectives and targets. • Communicate objectives and targets for each department. • Ensure sufficient resources are made available to facilitate the development of the Tactical Plan.
Functional HSLP and ESR Leads	• Establish and document APAC objectives, targets and KPI's before the annual budget cycle. • Provide technical resources to assist with the achievement of Regional and Site plans and development of any corrective action plans where deviations are identified. • Monitor progress against APAC Regional business plan on a monthly basis.
All Employees and Business Partners	• Understand requirements associated with the Business Plan and actively contribute to achieving set targets, goals and KPI's. • Actively participate in Continuous Improvement activities.

ISO/OHSAS, APAC IMS Reference
ISO 14001:2004 - 4.3.3 Objectives, Targets and Programmes
OHSAS 18001:2007 - 4.3.3 Objectives and Programmes
OHSAS 18001:2007 - 4.5.1 Performance management and monitoring
APAC IMS Regional Procedure - NAP-IMS-PR-70-15810 Planning, Goals and Targets Regional Procedure

Standard 5 Competence, Training and Awareness

1. Intent

To ensure Newmont APAC's approach and methodology to training provides requisite skills, knowledge, training and assessment of competency within its operations and facilities to ensure personnel are skilled and qualified to undertake their role with consideration to HSLP and ESR.

2. Requirements

2.1 Approach

All Newmont APAC operations and facilities will ensure that all persons under its control are trained and competent to perform their duties, and will develop and implement a Training, Competency and Awareness programme that include relevant HSLP and ESR requirements. These programmes will function within a framework of competency-based training and will follow processes established in the supporting Procedure. These programmes should include:

- workplace induction processes
- identification of training needs
- design of training programmes
- risk profiles
- types of training programmes required
- discipline specific training
- competency assessment process
- evaluation of training effectiveness
- training Record Management
- retraining/refresher requirements.

Review and monitoring processes will ensure currency of competency and based on the risk of specific tasks these processes will allow periodic reassessment to be undertaken as required.

2.2 Deployment

Training, competency and awareness programmes will be consistent with the APAC Regional Learning and Organisational Development - Training and Assessment Management Procedure. This will ensure all personnel are trained and assessed as competent to conduct activities associated with their role and includes training associated HSLP and ESR risks and hazards as well as discipline specific and technical hazard training.

APAC operations and facilities will implement these training programmes in an appropriate time frame defined by regulatory and other industry requirements, job requirements, risk profiles, policies, procedures and/or operational plans.

Processes for capturing prior learning, skills and/or qualifications against individual's records will comprise a part of this process.

Records of all induction, awareness and competency-based training must be retained in accordance with the supporting Procedure.

2.3 Review

Training and competency programmes will be reviewed for their effectiveness at least every two years Priority will be given to high-risk profiles tasks and discipline specific standards. The method of assessment will be determined in accordance with the supporting Procedure.

Review of training programmes will include relevant operational line managers, HSLP and ESR technical leaders and technical specialists to ensure currency, alignment to operational requirements and any changes initiated through the Management of Change process. Changes to the content, recipients, method of delivery or other aspects of the programme will be documented and communicated in accordance with the Management of Change Regional Procedure.

3. Accountability

Role	Action
Standard Owner/Champion – Group Executive Human Resources	• Ensure processes are in place and functioning to demonstrate conformance to the standard.
APLT	• Review and endorse IMS Standard 5. • Support Competence, Training and Awareness programme. • Provide adequate resources facilities and equipment to deliver effective training programmes.
Operation/Facility Leadership Teams	• Support Competence, Training and Awareness programme. • Review effectiveness through annual Management Review. • Provide adequate site resources facilities and equipment to deliver effective training programmes.
Line Leadership Roles – Newmont and Business Partners Leaders	• Support Competence, Training and Awareness programme. • Identify training required for team members and Business Partners and ensure training is provided. • Approve individual development plans for team members. • Review compliance with standards in the work place and identify opportunities for improvements. • Provide feedback on performance of training systems processes and programmes.
Functional HSLP and ESR Leads	• Provide technical guidance and information for HSLP and ESR Competence, Training and Awareness programme requirements.
All Employees and Business Partners	• Participate in required Competence, Training and Awareness programme as required. • Ensure personal development requirements are communicated to supervisors and site leaders.

ISO/OHSAS, APAC IMS Reference
ISO 14001:2004 - 4.4.2 Competence, Training and Awareness
OHSAS 18001:2007 - 4.4.2 Competence, Training and Awareness
APAC Learning and Organisational Development Procedure – NAP-LOD-PR-70-17739 Training and Assessment Management Procedure

Standard 6 Behavioural Interactions

1. Intent

To identify and recognise more safe behaviour, eliminate sub-standard acts and promote the identification of improvement opportunities.

2. Requirements

2.1 Approach

All Newmont APAC operations and facilities will adopt framework processes and programmes to ensure that systematic observations are being conducted in the workplace. Behavioural interactions will focus on the reinforcement of more safe behaviours as well as providing feedback to personnel to correct less safe behaviours. Observations will be prioritised based on higher risk work activities.

Newmont APAC will utilise processes and programmes that:

- Enable communication of desired and observed interactions.
- Establish targets for behavioural based interactions.
- Identify positive and sub-standard acts in the workplace.
- Capture ESR and HSLP behaviours.
- Allow for information to be collected, stored and analysed.
- Recognise and reward the positive behaviours of personnel.
- Contribute to the identification of improvement opportunities.

Programmes will be conducted utilising the methodologies detailed in the supporting documentation. The Behavioural Interaction Standard and supporting documentation will be applicable to all personnel, cover work activities and reinforce desired HSLP and ESR behaviours and correct less safe behaviours.

2.2 Deployment

Behavioural interaction processes and programmes will be deployed on all APAC operations and facilities in a manner consistent with the Standard and supporting documentation. It is a requirement that work at all levels be subject to behavioural observations and interactions. The focus of the interactions will be on the behavioural performance and a key component of these interactions will be to engage team members in meaningful conversations.

2.3 Review

Data from behavioural processes will be analysed and used to identify, plan, implement and track initiatives and appropriate corrective actions to improve operational facility.

The Behavioural Based Interaction HSLP & ESR performance system will be measured against set KPI's on a monthly basis and will be reviewed annually to identify improvement opportunities and /or training needs.

3. Accountability

Role	Action
Standard Owner/Champion – Group Executive Human Resources	• Ensure processes are in place and functioning to demonstrate conformance to the standard.
APLT	• Review and endorse IMS Standard 6. • Review regional statistical data at least Quarterly of numbers of interactions.
Operation/Facility Leadership Teams	• Review site statistical data on a monthly basis of numbers of interactions. • Quarterly communication of trends and general findings from observation processes.
Line Leadership Roles – Newmont and Business Partners Leaders	• Monitor the quantity and quality of interactions. • Review statistical information on a monthly basis. • Ensure that documentation associated with interactions is distributed to the relevant department.
Functional HSLP and ESR Leads	• Review monthly trend reports and identify areas of concern. • Support operations to develop action plans to address any undesired trends.
All Employees and Business Partners	• Participate in relevant training to ensure understanding and effective application of observation processes and methodology. • Actively conduct field observation in line with operational targets. • Correct any at - risk behaviours identified during the observations.

ISO/OHSAS, APAC IMS Reference
ISO 14001:2004 – 4.4.3 Communication, 4.4.6 Operational Control
OHSAS 18001:2007 - 4.4.3 Communication, Participation and Consultation; 4.4.6 Operational Control; 4.5.1 Performance measurement and monitoring.
APAC IMS Regional Procedure – NAP-IMS-PR-70-15612 Behavioural Interactions Regional Procedure

Standard 7 Communication, Consultation and Participation

1. Intent

To ensure effective, transparent and open communication and consultation is maintained between management, personnel and all stakeholders associated with Newmont APAC activities. To ensure management, personnel and external stakeholders are encouraged to participate and contribute to both HSLP and ESR management systems and performance improvement initiatives.

2. Requirements

2.1 Approach

All APAC operations and facilities will implement and maintain processes that provide personnel with the opportunity for feedback and participation in areas that impact on their responsibilities and/or work activities. This will include reporting, consultation, meetings and development of any additional communication processes.

The approach used by Newmont APAC will ensure that suitable processes, systems and frameworks exist which:

- Encourage personnel to identify improvement opportunities in HSLP and ESR.
- Encourage receiving suggestions.
- Support communication of performance externally.
- Clearly defines communication protocols with external stakeholders.
- Engage external parties about HSLP and ESR matters where relevant.
- Inform personnel about participation arrangements.

Processes and frameworks will enable internal communication across various levels of APAC as well as with other stakeholders. Participation and consultation specifically related to HSLP and ESR matters will be consistent with the supporting documentation and ensure that personnel are consulted and engaged in the review of relevant HSLP / ESR processes and have representation on matters related to HSLP and ESR.

2.2 Deployment

Communication, consultation and participation processes will be deployed across all APAC operations and facilities and will be reviewed and verified in accordance with the Communication, Consultation and Participation Regional Procedure. Relevant records of communications will be maintained and be consistent with IMS Standard 8 Systems Documentation and Records Management.

External stakeholder identification and engagement strategies implemented by APAC operations and facilities will adhere to relevant requirements specified within the APAC Social Responsibility Discipline Specific Standards.

Where external reporting is required, Newmont APAC operations or facilities management teams will ensure that it is done in a manner consistent with APAC IMS Standard 3 Legal Requirements and Other Commitments.

2.3 Review

Operations and facilities will establish processes to ensure that major communications and consultation activities are monitored and reviewed at least annually to ensure their effectiveness and to enable personnel / external stakeholder feedback.

Management reviews will be conducted at both a regional and facility / operational level. This will ensure that both deficiencies and improvements opportunities are identified and acted on and areas of leading practice are identified, supported, sponsored and shared throughout the business.

These reviews will include all relevant operational line managers and ESR and HSLP technical leaders and be documented and communicated in accordance with the supporting documentation.

The Action Management System (Cintellate) will be used to track the completion of actions from these reviews, and periodic assessments will be undertaken to ensure actions have been closed.

3. Accountability

Role	Action
Standard Owner/Champion – Group Executive Sustainability and External Relations	• Ensure processes are in place and functioning to demonstrate conformance to the standard.
APLT	• Review and endorse IMS Standard 7. • Communicate Corporate and Regional Strategies as well as objectives and targets to APAC operations and facilities. • Consider feedback from personnel, business partners and external stakeholders during management reviews.
Operation/Facility Leadership Teams	• Communicate site and regional objectives and targets to operations and facilities. • Consider feedback from personnel, business partners and external stakeholders during management reviews.
Line Leadership Roles – Newmont and Business Partner Leaders	• Include HSLP and ESR in management meeting agendas. • Attend a Safety & ESR Meeting at least monthly. • Communicate operational targets to personnel.
Functional HSLP and ESR Leads	• Facilitate effective communication for HSLP and ESR across the region. • Participate in Mining industry bodies / forums. • Coordinate APAC Regional public sustainability reporting initiatives. • Advise operations of ESR Global or Regional Voluntary Commitments.
All Employees and Business Partners	• All employees and business partners at operations/facilities should attend daily pre-start meetings Participate in employee surveys. • Attend and actively participate in safety meetings.

ISO/OHSAS, APAC IMS Reference
ISO 14001:2004 - 4.4.3 Communication
OHSAS 18001:2007 - 4.4.3 Communication, Participation and Consultation
APAC IMS Regional Procedure – NAP-IMS-PR-70-15805 Communication, Consultation and Participation Regional Procedure

Standard 8 Systems Documentation and Records Management

1. Intent

To ensure systems and processes utilised within Newmont APAC deliver consistent and effective identification, distribution, storage and control of all documents and records required for the effective operation of the Integrated Management System (IMS).

2. Requirements

2.1 Approach

Newmont APAC will ensure that documentation of the H&S and SER Integrated Management System:

- Describe the purpose, scope, main elements and document hierarchy of the IMS.
- Defines H&S and SER policies.
- Describe the main elements of each standard of the IMS.
- Includes reference to related Regional Procedures and interactions with other IMS Standards.
- Provide supporting documents to facilitate the implementation and maintenance of the IMS at a Regional and Operation / Facility level.

All Newmont APAC operations and facilities will establish and maintain systems to ensure that H&S and SER documents and processes are identified, controlled and that current versions of relevant documents will be available to personnel as required. Documents from external sources necessary for the planning, operation and verification of the IMS are registered and current.

Newmont APAC will utilise systems and processes to ensure that H&S and SER documents are:

- established;
- formal and approved by the business;
- controlled;
- updated and maintained;
- accurate;
- legible ; and
- identifiable.

Newmont APAC will ensure H&S and SER records are identifiable, retrievable and archived when obsolete. Records will be stored and managed in accordance with this standard and the Global Records Management Standard.

2.2 Deployment

Systems documentation management processes and records management processes to be consistently deployed across all Newmont APAC operations and facilities and conducted in a manner consistent with the Systems Documentation and Document Control Procedure, Global Records Management Guideline and Regional supporting documentation.

2.3 Review

A formal review of the Document Management Systems will be undertaken at a period of no greater than three yearly intervals and will be initiated by Functional H&S and SER Leads to ensure it is appropriate, functional and accessible.

The review cycle frequency of Controlled Documents is determined by the risk of an activity, product or service and is conducted in accordance with the supporting Regional Procedure by appropriate personnel and/or technical specialists at a minimum every 3 years or at any time as a result of changes in operational circumstances, reviews of risk assessments and actions arising from incident/accident investigations or other relevant initiating factors.

3. Accountability

Role	Action
Standard Owner/Champion – Group Executive Legal	• Ensure processes are in place and functioning to demonstrate conformance to the standard.
APLT	• Review and endorse IMS Standard 8. • Review and approve relevant APAC management system documents prior to publishing in the Document Control Centre on Prospector. • Provide resources to implement and maintain regional System Documentation and Record Management processes.
Operation/Facility Leadership Teams	• Provide resources and support for the System Documentation and Records Management processes. • Review management system documents where required. • Ensure that relevant records are made available for internal / external audits.
Line Leadership Roles – Newmont and Business Partner Leaders	• Review relevant procedures and other documents with regards to their area of responsibility. • Provide resources and support for the System Documentation and Records Management processes.
Functional H&S and SER Leads	• Provide resources for the development, implementation and maintenance of regional System Documentation and Records Management processes. • Approve documents associated with the IMS as required.
Regional Records Management Team	• Liaise with Site IMS Coordinators and Document Controllers to ensure consistency between site based and Regional Document Control processes. • Coordinate the delivery of appropriate training to Newmont Asia Pacific staff on Document Control and Records Management procedures and policies. • Implement records management systems and processes in APAC.
Site Operations – Document Controller / Records Manager	• Implement records management procedure specific to site operations in accordance with APAC records management systems and processes. • Support and maintain records management process at operation level.
All Employees and Business Partners	• Adherence to Regional Procedures and associated procedures. • Follow Document Control and Records Management processes.

Reference Documents
ISO 14001:2004 - 4.4.4 Documentation, 4.4.5 Control of Documents, 4.5.4 Control of Records
OHSAS 18001:2007 - 4.4.4 Documentation, 4.4.5 Control of Documents, 4.5.4 Control of Records
APAC IMS Regional Procedures – NAP-IMS-PR-70-15973 Systems Documentation and Document Control Regional Procedure 8a, NEM-LEG-STA-009 Records Management Standard, NEM-LEG-GDL-001 Records Management Guideline and NAP-IMS-PR-70-15671 Records Management Regional Procedure 8b

Standard 9 Business Partner Selection and Management

1. Intent

To direct (or control) the selection, engagement and management of business partners to ensure that their plans and activities on sites/facilities results in HSLP and ESR outcomes that are aligned with Newmont's HSLP and ESR policies and standards.

2. Requirements

2.1 Approach

Suppliers and business partners will be selected, engaged and managed using a formal risk-based and systemised process that is linked to Newmont's HSLP, ESR and Legal operating performance requirements.

This process will ensure that only service providers who have the required resources, established systems and proven track record to successfully achieve Newmont's commercial, HSLP, ESR and Legal expectations, including legislative requirements are selected and engaged. Processes and consequences will be in place to respond to non-conformance to pre-defined performance criteria.

Defined approval levels will ensure the appropriate level of authority is engaged to approve the use of each supplier and business partner, according to the HSLP, ESR and financial risk profile of the proposed service.

2.2 Deployment

The requirements of this Standard are applicable to all Newmont APAC facilities who engage suppliers and business partners.

Business partner selection and management will include but not be limited to:

1. Business partner pre-qualification taking into account financial, legal, technical, HSLP and ESR performance and capability.
2. Functional review of management systems to ensure alignment to the Newmont APAC IMS.
3. Risk assessments and action plans are established prior to commencement of activities.
4. Regular monitoring of the business partners' performance in the field.
5. Ensuring close out reports are completed following the Contract close out meeting for all high risk or high value Contracts and within 60 days of contract completion.

It is a requirement that Contracts for business partners undertaking work on a site/facility will include HSLP and ESR obligations and Key Performance Indicators.

2.3 Review

Contract Management System reviews will be carried out at least annually at both a regional and operational level. These reviews will ensure areas for improvement are identified and acted on and that areas of leading practice are supported, sponsored and shared throughout the business.

These reviews will include all relevant operational line managers, ESR and HSLP technical leaders and be documented and communicated in accordance with the Communication, Consultation and Participation Standard.

3. Accountability

Role	Action
Standard Owner/Champion – Group Executive Business	• Review and endorse IMS 9 and relevant policies. • Provide the appropriate resources to ensure the successful functioning of this Standard.
APLT & SLT	• Define HSLP and ESR accountabilities and responsibilities. • Define accountabilities and responsibilities of relevant departmental managers. • Lead and participate in the annual review of IMS 9. • Ensure IMS 9 supporting documentation is also reviewed at least annually.
All Leadership Roles – Newmont and Business Partners Leaders	• Manage and review business partner performance. • Ensure subordinate employees participate/cooperate in inspections, audits and assigned training requirements.
Functional HSLP and ESR Leads	• Assist GSM to develop business partner selection and management process. • Participate in reviews of high risk contracts. • Participate in IMS reviews and supporting documentation reviews.
All Employees and Business Partners	• Understand requirements associated with the Contract Management System and associated HSLP and ESR obligations. • Participate in necessary training.

ISO/OHSAS, APAC IMS Reference
ISO 14001:2004 - 4.4.2 Competence, Training and Awareness, 4.4.6 Operational Control
OHSAS 18001:2007 - 4.4.2 Competence, Training and Awareness, 4.4.6 Operational Control
APAC IMS Regional Procedures – NAP-IMS-PR-70-16201 Business Partner Selection and Management Regional Procedure

Standard 10 Accident/Incident Reporting and Investigation

1. Intent

To report HSLP and ESR accidents/incidents, including non-compliances and near misses and ensure they are investigated and analysed according to severity and that underlying root causes are determined and corrective and preventative actions are implemented to prevent recurrences. Where appropriate, outcomes and learnings are communicated across Newmont APAC and the global business.

2. Requirements

2.1 Approach

All Newmont APAC operations and facilities will implement and effectively maintain a process for Accident / Incident Reporting and Investigation so that all accidents/incidents and near misses are reported, recorded and investigated in a timely manner. The process will follow the supporting Regional Procedures, to ensure reporting and investigation satisfies APAC Regional and Corporate reporting requirements and regulatory requirements.

Newmont APAC will utilise accident/incident reporting processes that are based on the Actual or Potential severity of an incident that:

- Detail the nature of the accident/incident.
- Classify the event severity.
- Identify the correct level of investigation required based on the classification of event severity and investigation processes that:
    - Clearly define the investigation requirements based on event type.
    - Use the approved Newmont model to determine deficiencies and root causes.
    - Ensure appropriate actions are applied to address root causes and contributing factors based on the hierarchy of control.

2.2 Deployment

Accident / Incident Reporting and Investigation processes will be in accordance with the supporting Accident/Incident Reporting and Investigation Regional Procedures. Where there is requirement to undertake investigations related to an Actual/Potential Level 4 and 5 events these will be facilitated by appropriately trained personnel. Site risk registers will be reviewed following an Actual/Potential Level 4 and 5 event.

All accident/incident reports and investigation documentation will be retained in accordance with APAC IMS Standard 8 Records Management and Systems Documentation and Document Control Regional Procedures.

Investigations for Actual/Potential Level 4 and 5 events will be reviewed through the Corporate/Regional and Site conference calls as detailed in the Accident/Incident Reporting and Investigation Regional Procedure.

2.3 Review

The Regional/Site Leadership Teams will ensure that a review process is established to review investigations and controls needed to prevent recurrences of actual or potential level 4 or 5 events.

Site/Facility Leadership teams will undertake reviews to randomly check the quality and completeness of the accident/incident investigation and corrective action process for actual or potential risk consequence level 3, 4 and 5 events.

Analysis and trending of accident/incident data will be conducted on a regular frequency and reported to the respective Leadership Teams to assist in the identification of improvement opportunities.

Operation / Facility leadership teams will verify the adequacy and completion of corrective and preventative actions implemented as a result of investigations to ensure they are effective and implemented to the required standard.

3. Accountability

Role	Action
Standard Owner/Champion – Group Executive: Exploration	• Ensure processes are in place and functioning to demonstrate conformance to the standard. • Participate in investigation reviews.
APLT	• Review and approve APAC IMS Standard 10. • Track and monitor regional accident/incident Key Performance Indicators (KPIs).
Operation/Facility Leadership Teams	• Participate in the investigation of actual catastrophic events (risk consequence level 5). • Assign team leaders for key investigations levels 3-5. • Review the quality of investigations and controls for actual or potential level 5 events. • Review risk consequence level 4 and 5 Safety Alerts for events on other sites.
Line Leadership Roles – Newmont and Business Partners Leaders	• Ensure level 3 - 5 investigations are completed within 21 days of the event. • Prepare and sign-off on risk consequence level 3-5 Safety and ESR Alerts. • Ensure sufficient availability of site investigation leaders.
Functional HSLP and ESR Leads	• Facilitate actual risk consequence level 5 event investigations. • Ensure incident reporting protocols are followed within prescribed timeframes as stipulated in the IMS 10 Regional Procedures. • Ensure training for investigation leaders is available, relevant and delivered.
All Employees and Business Partners	• Immediately report all accidents/incidents and near misses. • Report non-emergency medical conditions. • Participate in accident/incident investigations, when involved or requested.

ISO/OHSAS, APAC IMS Reference
OHSAS 18001 - 4.5.1. Performance Management & Monitoring; 4.5.3.1 - Incident Investigation
APAC IMS Regional Procedures – NAP-IMS-PR-70-15671 Records Management Regional Procedure
NAP-IMS-PR-70-15973 Systems Documentation and Document Control Regional Procedure
NAP-IMS-PR-70-15184 Accident and Incident Reporting and Classification Regional Procedure 10a
NAP-IMS-PR-70-15681 Accident and Incident Investigation Regional Procedure 10b

Standard 11 Emergency Preparedness and Response

1. Intent

To ensure all Newmont APAC operations and facilities have adequately identified, planned for, and are able to respond effectively to all emergency situations with the potential to impact Newmont APAC personnel and business partners, operations, the environment or reputation.

2. Requirements

2.1 Approach

All Newmont APAC operations and facilities will have an Emergency Preparedness and Response process in place to:

- Identify the potential for H&S and S&ER emergency situations and incidents.
- Develop, maintain and review Emergency Preparedness and Response Plans so they provide the framework and training for the systematic response to such emergency situations.
- Define the required levels of Emergency Response and Support Personnel.
- Ensure legislative compliance regarding emergency equipment location, inspection and maintenance.
- Ensure that the requirements of the Global Rapid Response Standard is appropriately implemented.

The Emergency Preparedness and Response Plans will:

- Be aligned to the NMC Rapid Response System.
- Be linked to the Site Risk Register.
- Meet relevant legal and other requirements.
- Take into account geographic location of potential events and proximity to external emergency services, populated areas and sensitive ecosystems.
- Be reviewed annually by the facility leadership team and other key stakeholders.
- Define the requirements of emergency coordination and notification.
- Be linked to the training of emergency response personnel.
- Form the basis of emergency response training exercises.
- Include recovery procedures required post emergency events.

The process will follow those detailed in the supporting Regional Procedure and will ensure that Newmont APAC is capable of responding to emergency situations / incidents and prevent or mitigate associated adverse H&S and S&ER consequences.

2.2 Deployment

Emergency Preparedness and Response processes will be deployed maintained and regularly tested at all Newmont APAC operations and facilities in a manner consistent with the Emergency Preparedness and Response Regional Procedure. It is a requirement that systematic identification of events that would require the utilisation of emergency response is undertaken. As a minimum the Site Risk Registers will be used to identify potential emergency events.

Newmont APAC operations and facilities will develop an Emergency Management Plan and ensure its distribution and maintenance as per the Systems Documentation and Document Control Regional Procedure.

Exercises will be conducted regularly as per the Newmont APAC regional procedures, legislative requirements and in accordance with the type and frequency detailed in Emergency Preparedness and Response Regional Procedure.

2.3 Review

An annual review of Emergency Preparedness and Response Plans will be conducted to maximise the operation or facilities preparedness for emergency situations.

The operation and facilities will conduct a formal debrief and review within twenty-one days following emergency response events or exercises. All actions identified are entered and tracked in existing business management systems and reported on at an agreed frequency.

3. Accountability

Role	Action
Standard Owner/Champion – General Manager Operations Support	• Ensure processes are in place and functioning to demonstrate conformance to the standard.
APLT	• Review and endorse IMS Standard 11. • Participate in Regional Emergency Exercises as required.
Operations / Facilities Leadership Teams	• Participate in Emergency Exercises as required. • Define H&S and S&ER accountabilities and responsibilities. • Ensures government and media communications and public statements are issued as per NMC Rapid Response System. • Ensure that necessary resources are available. • Define H&S and S&ER roles, responsibilities, objectives and measure performance.
Line Leadership Roles – Newmont and Business Partners Leaders	• Be familiar with the operations Emergency Response Plan in their area of operation.
Functional H&S and S&ER Leads	• Develop, maintain and communicate the Regional Rapid Response System. • Regional Rapid Response Coordinator will coordinate regional Rapid Response Exercises. • Participate in emergency response exercise and deployment reviews. • Develop scenarios for exercises.
All Employees and Business Partners	• Understand role and its H&S and S&ER obligations. • Ensure emergency equipment in their area of operation is adequate and readily accessible. • Participate in necessary training.

ISO/OHSAS, APAC IMS Reference
ISO 14001:2004 - 4.4.7 Emergency Preparedness and Response
OHSAS 18001:2007 - 4.4.7 Emergency Preparedness and Response
Global Standard – NEM-COM-STA-001 Rapid Response Standard
APAC IMS Regional Procedure – NAP-IMS-PR-70-15319 Emergency Preparedness and Response Regional Procedure

Standard 12 Monitoring & Measurement

1. Intent

To ensure HSLP and ESR monitoring and measurement programmes are established to assess the key characteristics of Newmont APAC operations that can impact on health and safety, the environment or stakeholder relations. To identify opportunities for improvement and ensure compliance with statutory, company and other requirements and/or commitments.

2. Requirements

2.1 Approach

All Newmont APAC operations and facilities will ensure that processes and programmes are implemented to regularly measure and monitor the key activities of the business. As a minimum this will include activities where there are, or may be, significant HSLP and/or ESR risk(s). Processes will follow those established in the supporting documentation so that:

- Monitoring and measurement programmes are appropriate and target significant occupational health and environmental risks and impacts.
- Risk and legal obligations are taken into consideration
- Data collection is standardized and documented.
- Maintenance plans exist for monitoring and measurement equipment.
- Monitoring and measurement data is retained.
- Data trending and analysis are periodically conducted and available for Management Reviews.

2.2 Deployment

Newmont APAC operations and facilities will ensure that all measurement and monitoring activities are undertaken in accordance with the Monitoring and Measurement documentation which includes requirements relating to:

- Monitoring programmes and schedules.
- Data management, analysis and records retention.
- Training and competency needs.
- Monitoring equipment calibrations and maintenance.

2.3 Review

Leadership teams will undertake periodic reviews of the HSLP and ESR performance including significant findings and trends from monitoring and measurement programmes.

Where monitoring results identify opportunities (positive or negative) and/or concerning or adverse trends, corrective actions should be agreed and entered into the Action Management System.

3. Accountability

Role	Action
Standard Owner/Champion – Group Executive Sustainability and External Relations	• Ensure processes are in place and functioning to demonstrate conformance to the standard.
APLT	• Review and endorse IMS Standard 12. • Set annual HSLP and ESR regional objectives and targets. • Allocate necessary resources. • Lead and participate in regional IMS reviews.
Operation/Facility Leadership Teams	• Allocate necessary resources. • Lead and participate in site IMS reviews.
Line Leadership Roles – Newmont and Business Partner Leaders	• Be aware of and participate in agreed operational monitoring programmes and schedules. • Participate in management reviews and initiate or manage corrective or mitigation actions.
Functional HSLP and ESR Leads	• Define HSLP and ESR monitoring and measurement requirements. • Establish and ensure compliance to appropriate monitoring programmes and schedules. • Provide adequate resources including trained staff, equipment, procedures, databases and record management, for establishment and maintenance of monitoring programmes. • Prepare necessary information for management review and highlight areas of concern and in need of mitigation or action. • Communicate monitoring results to stakeholders. • Establish and maintain procedures for the calibration and maintenance of relevant equipment. • Ensure monitoring data is processed and reviewed.
All Employees and Business Partners	• Participate in or assist with ESR and HSLP monitoring programme where required. • Record relevant data sufficient to facilitate subsequent corrective action and preventive action analysis. • Action mitigation or corrective action originating from monitoring results and/or management review.

ISO/OHSAS, APAC IMS Reference
ISO 14001:2004 - 4.5.1 Monitoring and Measurement
OHSAS 18001:2007 - 4.5.1 Performance Measurement and Monitoring
APAC IMS Regional Procedure – NAP-IMS-PR-70-15804 Monitoring and Measurement Regional Procedure

Standard 13 Workplace Inspections

1. Intent

To ensure that workplace areas and activities are inspected formally and informally on a regular basis to proactively identify hazards and to confirm that controls are maintained and effective.

2. Requirements

2.1 Approach

Workplace inspections will be conducted at all Newmont APAC operations and facilities to check the condition of the workplace. Inspections cover all aspects of the activities with a focus on mainly environmental, health and safety requirements, and where applicable social responsibility requirements.

Formal and informal workplace inspections will be carried out at operations and facilities to examine conditions, controls, practices and standards in and around the workplace with a frequency for each area based on the risk to people and/or the environment.

When undertaking workplace inspections at APAC operations and facilities, personnel should consider the following as a minimum (where applicable):

- Means of recording identified risks and hazards.
- Relevant legal obligations.
- Deployment of appropriate operational controls.
- General workplace conditions and equipment.
- Environmental and social aspects of the area.
- Conformance to Newmont APAC procedures and requirements.

Workplace inspections will include visual examination of the selected area and discussions with personnel working in these areas where required.

Workplace inspections will be conducted using the frameworks and documentation detailed in the supporting Regional Procedures and will ensure that Newmont APAC personnel and business partners are actively engaged in the assessment of immediate work areas.

2.2 Deployment

Workplace inspection processes and associated documentation will be utilised at all APAC operations and facilities in a manner consistent with the Workplace Inspections Regional Procedure. Operational departments will ensure that all workplace inspections satisfy any statutory and legal compliance requirements relevant to the work area.

It is a requirement that personnel undertake Pre-Start Work Area Inspections that are aligned to IMS Standard 2 Risk Management where applicable.

Observations and findings (risks and hazards) identified during inspections will be communicated to the supervisors and managed through existing systems and processes.

2.3 Review

Periodic and random review of documentation related to inspections will be initiated to verify the quality of inspections across all work areas.

Collated observations and findings (hazards) identified during inspections will be reviewed, at a minimum annually, to identify trends, concerns, deficiencies and any opportunities for improvement.

The operations management team will review any significant hazards identified through workplace inspections

3. Accountability

Role	Action
Standard Owner/Champion – General Manager Operations Services	• Ensure processes are in place and functioning to demonstrate conformance to the standard.
APLT	• Review and endorse IMS Standard 13. • Approve resources to establish, document and maintain the on-going integrity of the APAC IMS requirement.
Operation/Facility Leadership Teams	• Review site statistical data at least quarterly. • Provide resources to ensure that inspections are taking place according to the agreed frequency.
Line Leadership Roles – Newmont and Business Partners Leaders	• Conduct monthly planned workplace inspections based on risks. • Undertake periodic reviews of the quality of submitted inspection documentation. • Participate in annual reviews of collated inspection findings.
Functional HSLP and ESR Leads	• Prepare information and analysis as required for management reviews. • Participate in annual reviews of collated inspection findings.
All Employees and Business Partners	• Perform pre-start workplace inspections prior to commencing work activity. • Perform equipment pre-use inspections. • Take immediate corrective action or report to supervision any noted hazards.

ISO/OHSAS, APAC IMS Reference
ISO 14001:2004 - 4.4.6 Operational Control; 4.5.2 Evaluation of Compliance
OHSAS 18001:2007 - 4.4.6 Operational Control; 4.5.2 Evaluation of Compliance; 4.5.5 Internal Audit
APAC IMS Regional Procedure – NAP-IMS-PR-70-15562 Workplace Inspections Regional Procedure

Standard 14 Internal & External Audits

1. Intent

To provide the framework for the systematic and objective verification of Newmont APAC operations and facilities compliance with HSLP and ESR requirements and systems, including legal requirements and other commitments.

2. Requirements

2.1 Approach

All Newmont APAC operations and facilities will ensure that audits are conducted on an agreed frequency to:

1. Determine whether the management system:
    a. is providing adequate direction for the management of HSLP and ESR systems.
    b. elements have been implemented effectively and consistently; and
    c. is effective in meeting Newmont APAC HSLP & ESR policies and objectives
2. Provide information on the conformance of each operation and facility to the IMS requirements to senior management to assist in decision making.

Audit programme(s) will be planned, scheduled, implemented and maintained by the Regional Office and/or Operations in conjunction with the leaders at the operations/facilities.

Audit procedure(s) will be established and maintained that address:

- The responsibilities, competencies, and requirements for planning and conducting audits, reporting results and retaining associated audit and supporting records.
- The determination of audit criteria, scope, frequency and methods.
- Periodic evaluation of compliance with applicable legal and other requirements.

2.2 Deployment

All Newmont APAC operations and facilities will ensure that all internal and external audits of the IMS are completed in accordance with the Internal and External Audit Regional Procedure.

Internal audits are scheduled to cover the IMS Standards, HSLP Technical Standards, Environmental and Social Responsibility Discipline Specific Standards, Aviation, Community Agreements and Security Standards and other standards as developed and implemented from time to time.

External audits that evaluate compliance to legal or voluntary commitments will also be identified in schedules especially where relevant to HSLP and ESR performance and management.

Planning of audits must consider the importance of an activity or process to HSLP and ESR performance and management and will utilise a risk-based approach to guide the priority and frequency of audits. Business Partners conducting work involving significant health, safety and environmental risks must also be included in the scope of audit programmes.

The Newmont APAC Action Management System will be used for recording and tracking actions associated with audit findings.

Operation and Facility Management Teams will commit resources to ensure that major and longer-term audit findings are progressed and closed out.

2.3 Review

At the conclusion of an audit, the results of audits will be presented to senior management at an Audit Close-out Meeting or the findings will be summarised at a Management Review meeting prior to the auditors leaving site.

Management reviews will consider all major and relevant findings of audits. Audit findings will be considered when developing objectives, targets and improvement initiatives in accordance with APAC IMS Standard 4 Planning, Goals and Targets

Where corrective actions have been identified, Operational/Facility Management Teams will review their implementation and on-going effectiveness.

3. Accountability

Role	Action
Standard Owner/Champion – Group Executive Sustainability and External Relations	• Ensure processes are in place and functioning to demonstrate conformance to the standard.
APLT	• Review and endorse IMS Standard 14. • Review progress of findings generated by corporate and/or external audits.
Operation/Facility Leadership Teams	• Support audit programmes. • Provide necessary resources for internal audits. • Review audits results and track close-out. • Review and approve annual audit schedules.
Line Leadership Roles – Newmont and Business Partners Leaders	• Support audit processes and provide audit resources where possible.
Functional HSLP and ESR Leads	• Identify and communicate audit needs. • Provide audit resources from within HSLP and ESR. • Coordinate Certification and Surveillance Audits.
All Employees and Business Partners	• Participate in audits when required.

ISO/OHSAS, APAC IMS Reference
ISO 14001:2004 - 4.5.2 Evaluation of Compliance, 4.5.5 Internal Audit
OHSAS 18001:2007 - 4.5.2 Evaluation of Compliance; 4.5.5 Internal Audit
APAC IMS Regional Procedure - NAP-IMS-PR-70-15557 Internal and External Audit Regional Procedure

Standard 15 Corrective & Preventative Actions

1. Intent

To ensure that actions identified or intended to correct, prevent and/or improve substandard acts, conditions, programmes and processes are properly recorded, managed and executed.

2. Requirements

2.1 Approach

APAC operations and facilities maintain a formal Action Management System that is used in accordance with the Supporting Regional Procedure. This will ensure that corrective and/or preventative actions originating from incident/accident investigations, inspections, audits, observations, complaints, risk and management reviews or other activities are adequately recorded and dealt with in a timely manner.

Progress against actions will be regularly monitored, reports completed and management reviews undertaken to ensure timely closeout of actions, and to confirm the identified controls have been implemented to an acceptable standard.

2.2 Deployment

All Newmont APAC operations and facilities will capture corrective and preventative actions in a manner consistent with the Corrective and Preventative Actions documentation and will ensure that appropriate personnel will be trained in the use of the Action Management System.

Where a corrective or preventive action identifies new or changed hazards and/or controls, the proposed actions will be risk assessed prior to implementation in accordance with the IMS Standard 2 Risk Management.

Any corrective or preventive action taken to manage or eliminate the causes of non-conformance will follow the hierarchy of control and be reasonably practicable in their implementation.

The verification process will be undertaken by relevant members of the Operation Management Team and will be completed via formal inspections or observations in the field (refer to Standard 13).

Complete records of actions are kept in the Action Management System.

2.3 Review

Status reports from the Action Management System will be regularly generated and reviewed by relevant line supervision and operational management to ensure accuracy of information on progress and/or completion.

This information will also be reviewed by appropriate managers and the APLT during management review meetings to identify trends and improvement opportunities.

3. Accountability

Role	Action
Standard Owner/Champion – General Manager Operations Services	• Ensure processes are in place and functioning to demonstrate conformance to the standard.
APLT	• Review and endorse IMS Standard 15. • Allocate necessary resources. • Monitor quality and timeliness of the close-out of actions generated through Level 3-5 event investigations.
Operation/Facility Leadership Teams	• Allocate necessary resources. • Review quality and timeliness of the close-out of actions generated through level 3-5 event investigations.
Line Leadership Roles – Newmont and Business Partner Leaders	• Ensure that preventative and/or corrective actions for all HSLP/ESR related events are captured in the action management tool. • Address all allocated actions in a timely manner. • Monitor quality and timeliness of the close-out of actions.
Functional HSLP and ESR Leads	• Provide resources for the development and maintenance of the Action Management System. • Address all allocated actions in a timely manner. • Monitor quality and timeliness of the close-out of actions. • Prepare necessary information for management review.
All Employees and Business Partner	• Address all allocated actions in a timely manner. • Participate in necessary training.

ISO/OHSAS, APAC IMS Reference
ISO 14001:2004 - 4.5.3 Nonconformity, Corrective Action and Preventative Action
OHSAS 18001:2007 - 4.5.3. Incident Investigation, Nonconformity, Preventative Action and Corrective Action
APAC IMS Regional Procedure – NAP-IMS-PR-70-15398 Corrective and Preventative Actions Regional Procedure

Standard 16 Operational Control

1. Intent

To provide a framework to ensure the consistent management of significant risks across the APAC region through the implementation of operational controls as prescribed in NMC Discipline Specific Technical Standards.

2. Requirements

2.1 Approach

Newmont Mining Corporations' Discipline Specific and/or Technical Standards define minimum operating standards and the controls required to manage activities considered to have potential significant risks and/or impacts to HSLP, Environment and Social Responsibility.

Discipline Specific/Technical Standards include HSLP, Environment, Social Responsibility, Security and Supply Chain Management Standards. The Standards are listed in the supporting Regional Procedure.

Discipline Specific / Technical Standards will be supported by relevant management plans and/or procedures to identify the processes and methods of control over the relevant HSLP and ESR risks at an operation or facility.

2.2 Deployment

APAC operations and facilities are required to comply with all Discipline Specific and Technical Standards relevant to their activities. Where the relevance of part of a standard to an operation or facility is questioned the operation/ facility must seek corporate approval to exclude the requirement through the Regional discipline lead.

Assessments of operations and facilities against the requirements established in the Discipline Specific Standards will be scheduled on a regular frequency in accordance with the Internal and External Audits Regional Procedure.

2.3 Review

In accordance with the Operational Control documentation, Regional HSLP and ESR leads as well as relevant regional and/or operational technical specialists will participate in periodic reviews of the Discipline Specific/Technical standards as requested by corporate leaders.

3. Accountability

Role	Action
Standard Owner/Champion – General Manager Operations Services	• Ensure processes are in place and functioning to demonstrate conformance to the standard.
APLT	• Review operations / facilities requests for exemptions from the standards and submit to Corporate for approval.
Operation/Facility Leadership Teams	• Review and endorse IMS Standard 16. • Provide leadership and participate in the deployment and implementation of the Discipline Specific Standards. • Participate in periodic reviews of the Discipline Specific Standards and identify opportunities for improvement.
Line Leadership Roles – Newmont and Business Partner Leaders	• Provide leadership in the effective implementation of the Discipline Specific Standards. • Participate in periodic reviews of the implementation of the requirements of the Discipline Specific Standards. • Ensure compliance to procedural requirements of the Discipline Specific Standards. • Incorporate Discipline specific standards requirements in AFE (Approval for Expenditure) requests
Functional HSLP and ESR Leads	• Coordinate and undertake reviews of the Discipline Specific Standards. • Ensure that relevant site management are developed, implemented and maintained and where required capital / technical resources are provided to meet Discipline Specific Standards. • Provide input to NMC for improvements to the Discipline Specific Standards
All Employees and Business Partners	• Understand requirements associated with the Operational Controls, Discipline Specific Standards Controls and associated HSLP and ESR obligations. • Actively participate in necessary training.

ISO/OHSAS, APAC IMS Reference
ISO 14001:2004 – 4.4.6 Operational Control
OHSAS 18001:2007 – 4.4.6 Operational Control
APAC IMS Regional Procedures – NAP-IMS-PR-70-15803 Operational Control Regional Procedure
NAP-IMS-PR-70-15557 Internal and External Audits Regional Procedure

Standard 17 Management of Change

1. Intent

To ensure changes to people, systems and technology are identified, reviewed and managed effectively prior to being implemented and/or introduced into the Business.

2. Requirements

2.1 Approach

All Newmont APAC operations and facilities will apply the Management of Change processes for all significant changes prior to implementation. The process will be in accordance with the supporting Regional Procedure and ensure all hazards and risks associated with each change are identified and controlled prior to the change being effected and follows an identified process. The change review process will allow controls necessary to manage the risks to be determined and implemented prior to the introduction of such changes.

2.2 Deployment

Changes required to management system processes or operations that could impact on HSLP and ESR performance will be planned, documented and approved at a relevant management level before implementation. The Management of Change process will be deployed on all Newmont APAC operations and facilities in a manner consistent with the Management of Change Regional Procedure.

Actions arising from a change will be tracked in existing Action Management System.

2.3 Review

Changing circumstances, including developments in legal and other requirements that potentially affect the IMS and HSLP and ESR performance will be reviewed at least annually, or as situations arise, by the APLT and Operations Leadership Teams.

The status of management of change ‘projects’ will be reviewed, based on the level of risk, to ensure actions have been completed and that the controls implemented to manage identified hazards and risks are effective.

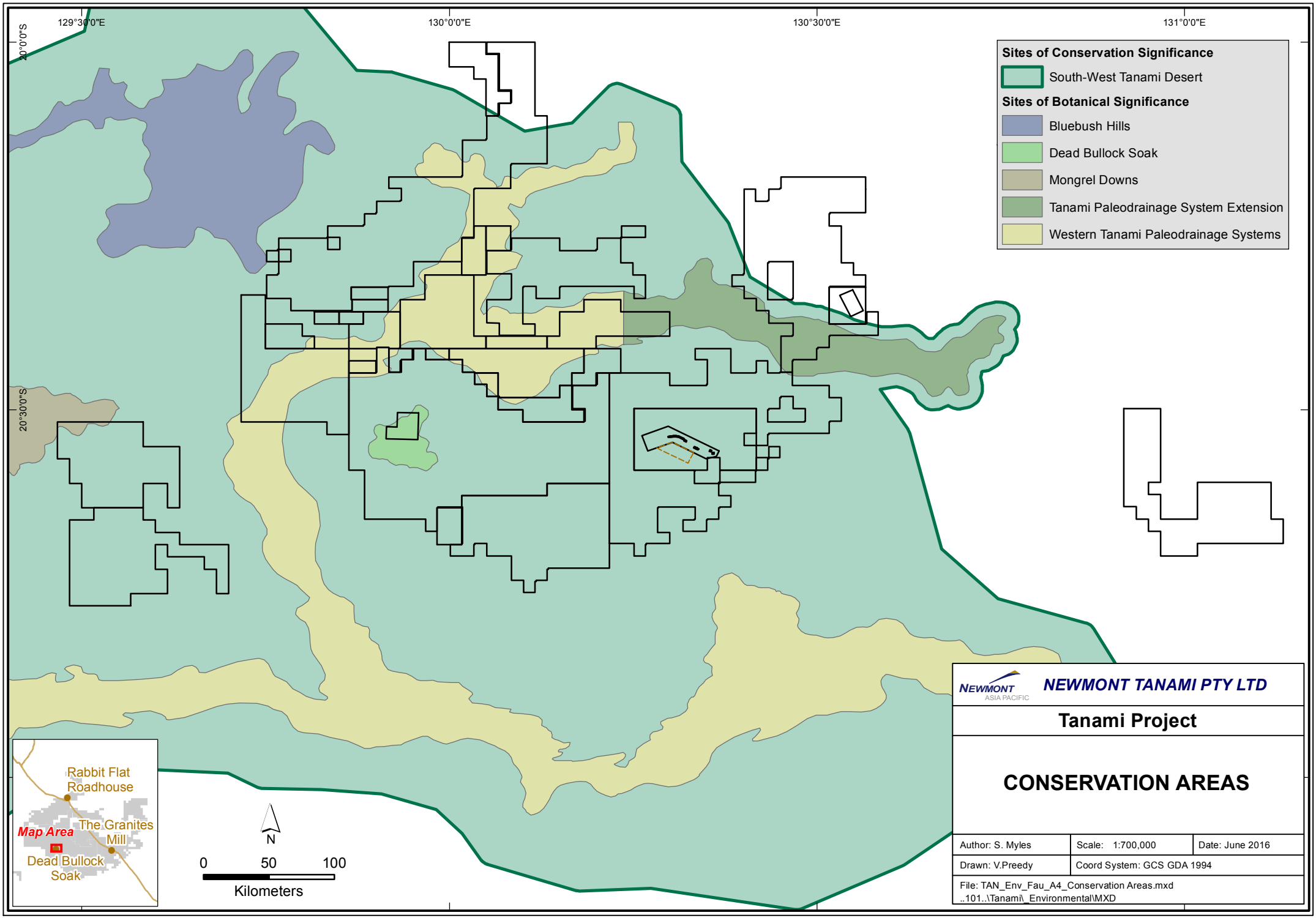
These reviews will include all relevant operational line managers and ESR and HSLP technical leaders, be documented and communicated in accordance with the primary supporting Regional Procedure.

3. Accountability

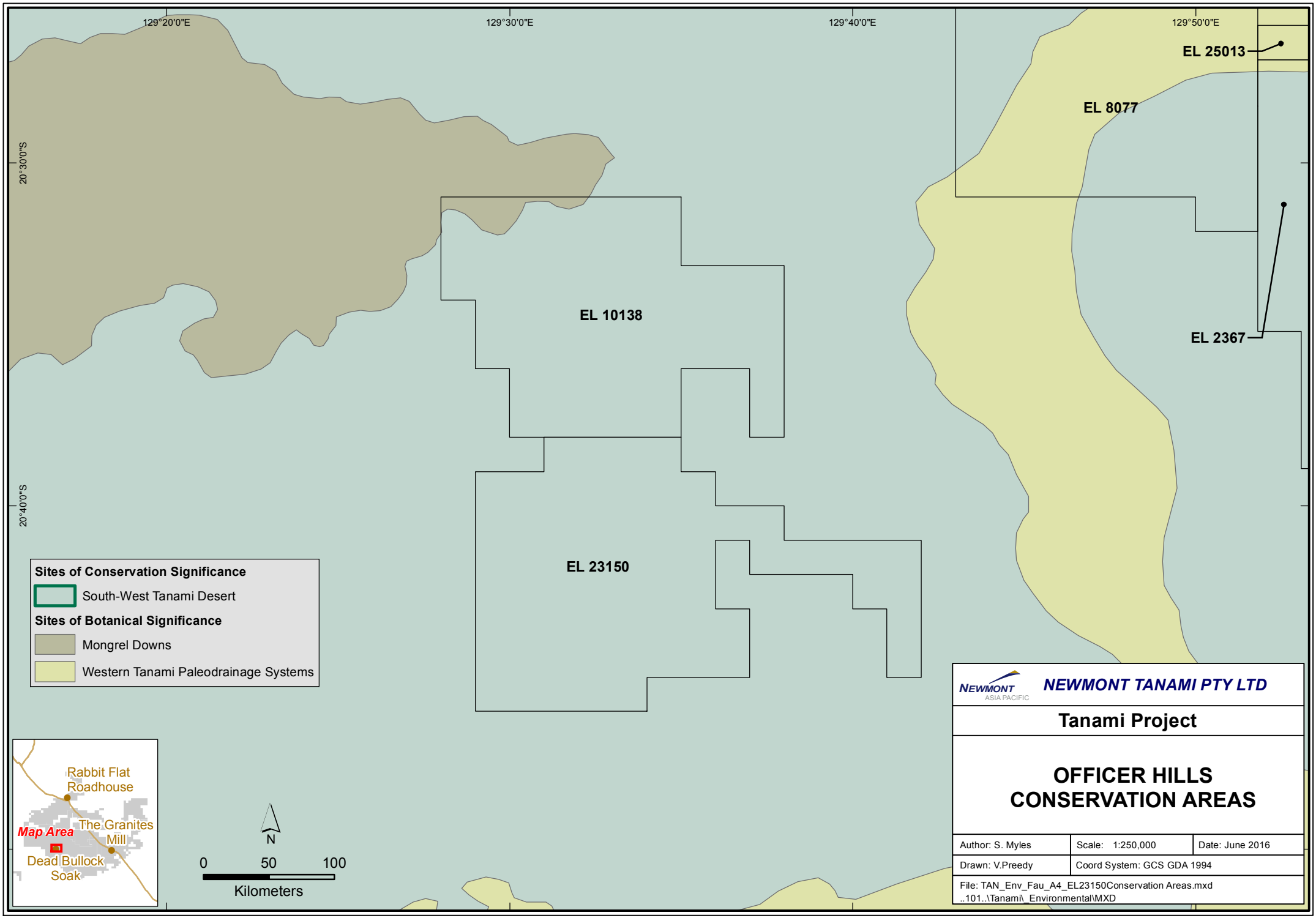
Role	Action
Standard Owner/Champion – Group Executive Sustainability and External Relations	• Ensure processes are in place and functioning to demonstrate conformance to the standard.
APLT	• Review and endorse IMS Standard 17. • Participate in the Management of Change process, approve changes and provide leadership in the implementation of the changes and controls where they are significant to the business. • Provide leadership in the effective implementation of the Management of Change process.
Operation/Facility Leadership Teams	• Participate in the Management of Change process, approve changes and provide leadership in the implementation of the changes and controls where they are significant to the business. • Provide leadership in the effective implementation of the Management of Change process. • Participate in periodic reviews of the effectiveness of the Management of Change process and identify opportunities for improvement.
Line Leadership Roles – Newmont and Business Partners	• Participate in the Management of Change process, approve changes and provide leadership in the implementation of the changes and controls where they are significant to the relevant facility. • Provide leadership in the effective implementation of the Management of Change process. • Lead periodic reviews of the effectiveness of the Management of Change process and identify opportunities for improvement. • Coach and mentor team members in the effective application of the Management of Change process.
Functional HSLP and ESR Leads	• Participate in Management of Change processes. • Undertake reviews of the effectiveness of the implementation of changes across the APAC Business.
All Employees and Business Partners	• Understand requirements associated with the Management of Change System and associated HSLP and ESR obligations. • Actively participate in Management of Change activities.

ISO/OHSAS, APAC IMS Reference
ISO 14001:2004 - 4.3.1 Environmental Aspects, 4.4.5 Control of Documents, 4.5.3 Non-conformity, Corrective and Preventive Action, 4.6. Management Review
OHSAS 18001:2007 - 4.3.1. Hazard Identification, Risk Assessment and Determining Controls, 4.4.3.2 Participation and Consultation, 4.4.5 Control of Documents, 4.4.6 Operational Control, 4.5.3.2 Non-conformity, Corrective and Preventive Action, 4.6 Management Review
APAC IMS Regional Procedure - NAP-IMS-PR-70-15764 Management of Change Regional Procedure

Appendix D – Tanami Region Conservation Areas


129°30'0"E
130°0'0"E
130°30'0"E
131°0'0"E
20°0'0"S
20°30'0"S
Sites of Conservation Significance
South-West Tanami Desert
Sites of Botanical Significance
Bluebush Hills
Dead Bullock Soak
Mongrel Downs
Tanami Paleodrainage System Extension
Western Tanami Paleodrainage Systems
Rabbit Flat Roadhouse
Map Area
The Granites
Mill
Dead Bullock Soak
N
0
50
100
Kilometers
NEWMONT ASIA PACIFIC
NEWMONT TANAMI PTY LTD
Tanami Project
CONSERVATION AREAS
Author: S. Myles
Scale: 1:700,000
Date: June 2016
Drawn: V.Preedy
Coord System: GCS GDA 1994
File: TAN_Env_Fau_A4_Conservation Areas.mxd
..101..\Tanami_Environmental\MXD

Appendix E – EL23150 Conservation Areas


129°20'0"E
129°30'0"E
129°40'0"E
129°50'0"E
20°30'0"S
20°40'0"S
EL 25013
EL 8077
EL 10138
EL 2367
EL 23150
Sites of Conservation Significance
South-West Tanami Desert
Sites of Botanical Significance
Mongrel Downs
Western Tanami Paleodrainage Systems
Rabbit Flat Roadhouse
Map Area
The Granites
Mill
Dead Bullock Soak
N
0
50
100
Kilometers
NEWMONT ASIA PACIFIC
NEWMONT TANAMI PTY LTD
Tanami Project
OFFICER HILLS CONSERVATION AREAS
Author: S. Myles
Scale: 1:250,000
Date: June 2016
Drawn: V.Preedy
Coord System: GCS GDA 1994
File: TAN_Env_Fau_A4_EL23150Conservation Areas.mxd
..101..\Tanami_Environmental\MXD