


Bell Creek
Nornico Project
Initial Advice Statement

Prepared for:
QLD Gold Pty Ltd
100% Subsidiary of Metallica Minerals Limited

February 2007

Document History and Status

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LIST OF ABBREVIATIONS

AARC	AustralAsian Resource Consultants Pty Ltd
BOM	Bureau of Meteorology
CHMP	Cultural Heritage Management Plan
EA	Environmental Authority
EIS	Environmental Impact Statement

EM Plan	Environmental Management Plan
EP Act	*Environmental Protection Act 1994*
EPM	Exploration Permit Minerals
ERA	Environmentally Relevant Activity
ha	hectares
IAS	Initial Advice Statement
km	kilometres
MW	Megawatt
m	metre
ML	Mining Lease
MLA	Mining Lease Application
Mt	Million tonnes
QEPA	Queensland Environmental Protection Agency
TOR	Terms of Reference
tpa	tonnes per annum

1.0 INTRODUCTION

AustralAsian Resource Consultants Pty Ltd (AARC) was commissioned by Metallica Minerals Limited (Metallica Minerals) to prepare an Initial Advice Statement (IAS) for the development of the Bell Creek Nornico Project (the Project).

Metallica Minerals is applying to the chief executive under Chapter 3, Part 2, Sections 70 and 71 of the *Environmental Protection Act 1994* (EP Act 1994) for approval to prepare a voluntary Environmental Impact Statement (EIS). This IAS contains supporting information as required by Section 2 of the Approval to Prepare a Voluntary EIS application form.

1.1 PROJECT OVERVIEW

The proposed Project is a heap leach operation producing nickel and cobalt mixed hydroxides. The Project is to be located in north Queensland, and involves a new Mining Lease Application (MLA) which will encompass the existing Mining Leases (ML) 4187 and 4188. These tenements are held by QLD Gold Pty Ltd, a wholly owned subsidiary of Metallica Minerals Limited.

The proposed Project will involve shallow pit mining from five pits, at a rate of approximately 1.5 million tonnes per annum (mtpa) of run of mine (ROM) ore. Ore treatment will involve crushing, screening, agglomeration, heap leach, iron removal, mixed hydroxide precipitation and spent ore disposal. The required workforce is estimated at approximately 130 personnel, with mining taking place on a 12-hour day shift, 7 days per week.

Infrastructure will include a processing plant, heap leach pads, stormwater and process ponds, acid plant for production of sulphuric acid, a limestone and lime plant and magnesia plant, workshops and offices, haul roads and a water pipeline from the Herbert River.

1.2 PROJECT LOCATION

The Project is located on the Atherton Tablelands in an area known as the Greenvale Nickel Province, approximately 80 kilometres (km) south-west of Atherton and 30km south of the small township of Mt Garnet. This region lies approximately 135km south west of Cairns, as shown in Figure 1. The Project MLA will encompass approximately 2000 hectares (ha) and lies within the Herberton Shire.

Access to the Project site is via the partly sealed Gunnawarra Road off the Kennedy Highway, from Cairns.

Figure 1: Regional Location of the Project site

1.3 PROJECT TENEMENTS AND OWNERS

The Project site is located within the boundaries of Exploration Permit for Minerals (EPM) 11285 and EPM 14101. The proposed MLA boundary is shown in Figure 2.

The holder of the EPMs is QLD Gold Pty Ltd, a wholly owned subsidiary of Metallica Minerals. Contact details are:

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Website: www.metallicaminerals.com.au

The background land tenure is 100% freehold land and is described as Lot 5 on GU58.

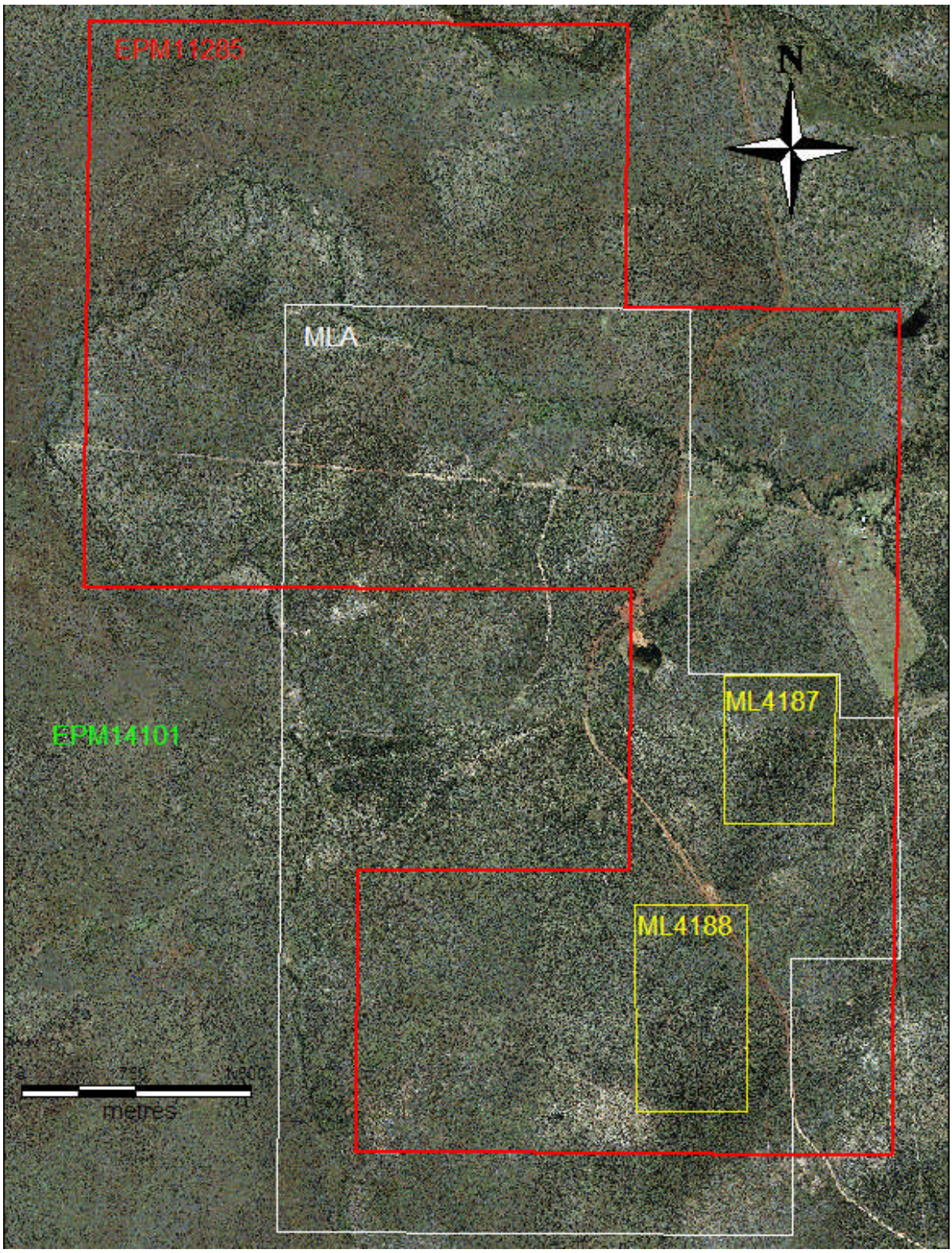


Figure 2: Project Tenements

2.0 PROPOSED PROJECT ACTIVITIES

2.1 EXPLORATION

Exploration and drilling activities will continue to be undertaken on the Project area to determine or prove up further ore resources. Drill pads and sumps will be constructed as necessary, and where possible existing roads and pads will be used.

2.2 VEGETATION REMOVAL AND TOPSOIL STRIPPING

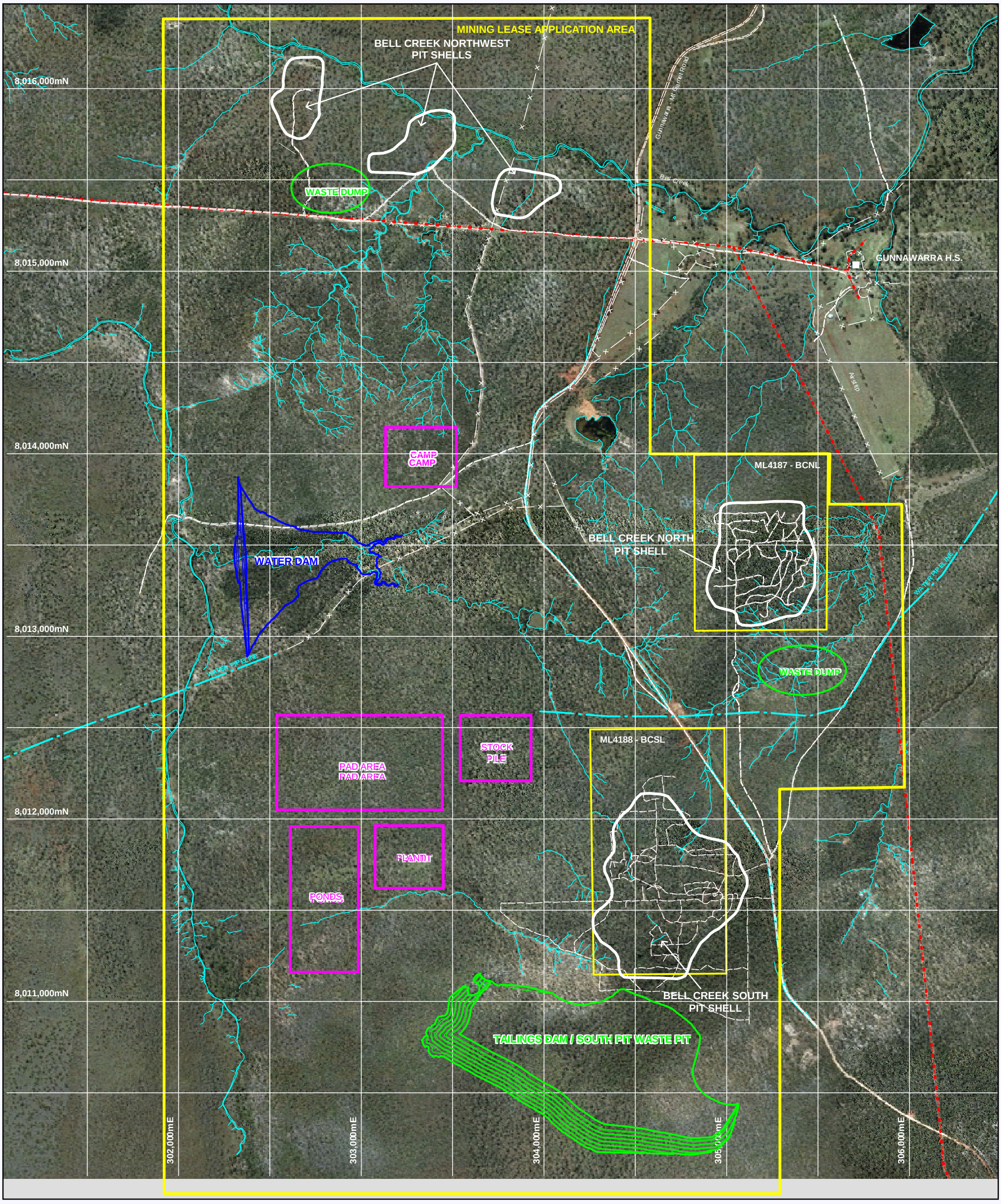
Prior to the development of any open cut pits, processing areas, waste rock dumps or infrastructure, vegetation and topsoil will be removed from the footprint area and stockpiled. The preferred option to dispose of large vegetation is to appoint a contractor to clear and use the timber for milling, wood-chipping, or other economically viable use. If this is not possible, large vegetation will be windrowed and burnt under controlled conditions. Smaller vegetation and grasses will be removed with the topsoil and stockpiled in windrows no higher than 2m. Where necessary, stockpiles will be seeded to encourage water infiltration, microbial activity and prevent erosion. Topsoil will be respread on surfaces to be rehabilitated as soon as possible to benefit from the viability of the topsoil seed bank.

The approximate amount of land clearing required for infrastructure on the Project is shown in Table 1. The conceptual mining and infrastructure layout is illustrated in Figure 3.

Table 1: Estimated Land Clearance Required on the Project

Disturbance Type	Area (ha)
Bell Creek South Pit	56
Bell Creek North Pit	33
Bell Creek North-west Pits	26
Waste rock dumps	10
Topsoil dumps	20
Roads/Tracks	10
Accommodation camp	16
Heap Leach Pad	45
Process plant and associated buildings	16
Crushing plant and ROM stockpile	16
Stormwater and Sediment Ponds and Process Ponds(within pond area)	30
Exploration	2
Tailings Dam	100*
Total	**380**

***A tailings dam will only be constructed if insufficient pit void space is available for co-disposal of spent ore and iron precipitate.**



0 200 400 600 800 1,000 m

1:20,000

Projection : MGA94 (GDA94) Zone 55

PROPOSED BELL CREEK MINING LEASE APPLICATION
showing
MINING INFRASTRUCTURE

2.3 RESOURCES

There are three main deposits within the Project site, as follows:

- **Bell Creek Northwest** - The Bell Creek Northwest Prospect will consist of three pits, and is located 25 km south of Mt Garnet on the Gunnawarra station. The area is relatively flat and isolated outcrops of laterite occur over a strike distance of 2.5 km.

- **Bell Creek North** - The Bell Creek North Prospect is located within a granted ML (4187). Previous drilling in the 1970's by Anderson Australia identified a relatively low grade zone of nickel laterite mineralisation that covered 25ha. The presence of widespread areas of silica box-working which contains numerous cavities meant that drilling was problematic and possibly resulted in the prospect not being drilled to the same density as Bell Creek South.

  The Bell Creek North laterite occurs mostly on the eastern slope of a hill, the nickel mineralisation forming a blanket which drapes over the topography. The mineralisation at the top of the hill is between 3 – 5m thick and it increases to in excess of 20m thick at the base of the slope. The nickel mineralisation is predominantly hosted in a silica rich laterite which has a relatively low iron and magnesium content and would be amenable to beneficiation. The mineralisation generally starts from surface and is predominantly found in an iron rich and silica laterite. Saprolitic mineralisation is rare.

- **Bell Creek South** - The Bell Creek South prospect is located 30 km south of Mt Garnet just off the Gunnawarra Road. The prospect has been subject to intense drilling with the area drilled on a 60 by 60m grid. The current Inferred Resource for Bell Creek South stands at 9.4Mt @ 0.84 % nickel and will form the main ore supply for the Project.

The Project resource estimates (Nov 2006) are shown in Table 2.

Table 2: Project Resources

Deposit	Tonnes (Mt)	Ni (%)	Co (%)	Iron (%)	Mg (%)	Contained tonnes Ni metal
Bell Creek NW	3.31	0.70	0.04	13.81	5.36	23,110
Bell Creek North	3.37	0.85	0.02	7.99	8.32	28,604
Bell Creek South	8.89	0.85	0.05	11.44	8.13	75,402
Total	**15.57**	**0.82**	**0.04**	**11.2**	**7.58**	**127,116**

Resources are estimated using a 0.5% nickel cutoff. Resources are currently classified as inferred under JORC guidelines

2.4 ORE EXTRACTION

The Project consists of five open-cut pits. Open cut mining will be contracted, with both the waste and ore extracted by dozers and excavators. The ore will be trucked to a ROM stockpile area adjacent to the top of the pit at an approximate rate of 4000 tonnes per day. The ore will be truck dumped in windrows, which will allow for separation of ore types and grades where required. Low grade material may be stockpiled separately for treatment later in the project life.

The ore will be mined by a combination of deep ripping, pushing up and free digging. Blasting is not anticipated to be necessary. Open cut mining will occur within a 7 day week for 52 weeks per year, working a 12 hour daytime shift.

The expected waste to ore ratio is estimated at <0.5:1.

2.5 PROCESSING

The project consists of a heap leach, metal recovery plant and associated facilities capable of processing approximately 1.5 million dry tonnes per annum (tpa) of laterite ore to generate approximately 10,000 tpa of nickel and 435 tpa of cobalt contained in a mixed hydroxide product.

A simplified process diagram is shown in Figure 4 and a more detailed flowchart, showing inputs and outputs, is shown in Figure 5. The main steps to the process are described below.

2.5.1 Crushing and Reclaim

Ore is hauled to the processing area. After crushing, the ore is transported by a belt conveyor to a crushed ore stockpile in the process plant area.

2.5.2 Agglomeration

During agglomeration, the laterite ore is mixed with sulphuric acid and water and possibly certain additives or binders to produce agglomerates which, when cured, are stable during heap leaching. The stability of the cured agglomerates allows the heap leach to operate with high permeability, and is a critical aspect of heap leaching technology. A second function of agglomeration is acid curing of the ores. The action of adding dilute sulphuric acid within the agglomerator promotes rapid initial leaching kinetics when heap leaching commences.

In the rotation agglomerator drum the crushed ore is contacted with dilute sulphuric acid with an optional addition of binder. Fresh water is also applied to achieve the required moisture level for effective agglomeration. As a consequence of the heat of mixing of sulphuric acid, the temperature of the agglomerates rises to 55-60 degrees Celcius,

Following agglomeration, the agglomerated ore is transported to the heap. Discharged agglomerates are directed onto an overland conveyor which transports the agglomerates to the leach pad feed conveyor. The leach pad feed conveyor subsequently transports the agglomerates to the heap leach pads.

The purpose of the stacking area is to receive and stack the crushed ore in preparation for heap leaching. The overland conveyor delivers the ore from a stockpile to a stacker. The stacker runs and stacks the ore from the one end to the other, and at the completion of each module it goes back to the start-end of the next module and re-commences stacking.

2.5.3 Heap Leaching and Solution Handling

The aim of the heap leach area is to extract nickel and cobalt from the ore by irrigation with dilute sulphuric acid solution. Each heap module is leached in a series of stages to utilise its neutralising capacity, extract the nickel into solution and to rinse and prepare the heap for decommissioning. Decommissioned spent ore is removed from the heap and disposed of in the mining pit voids, and fresh ore is stacked.

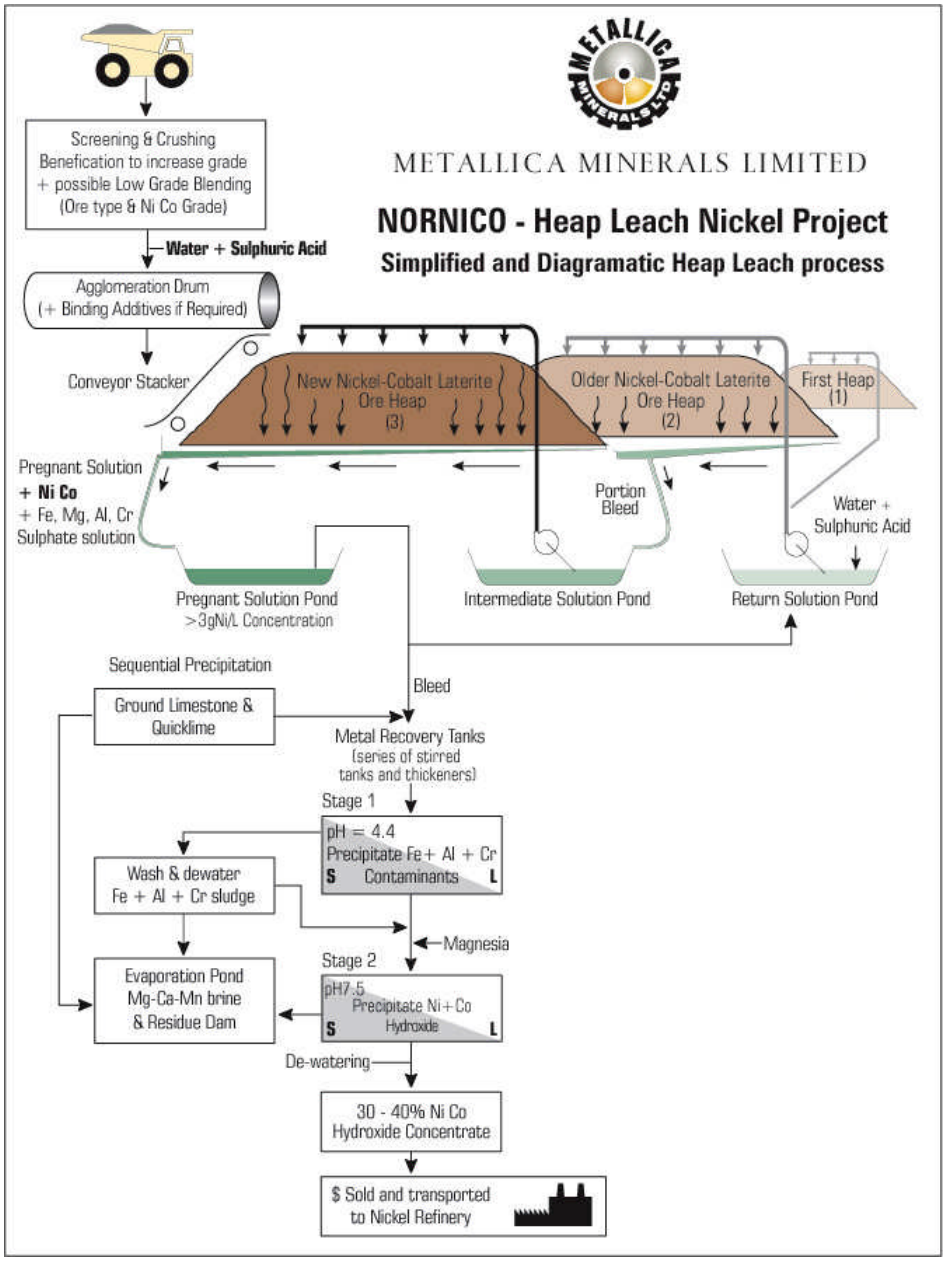
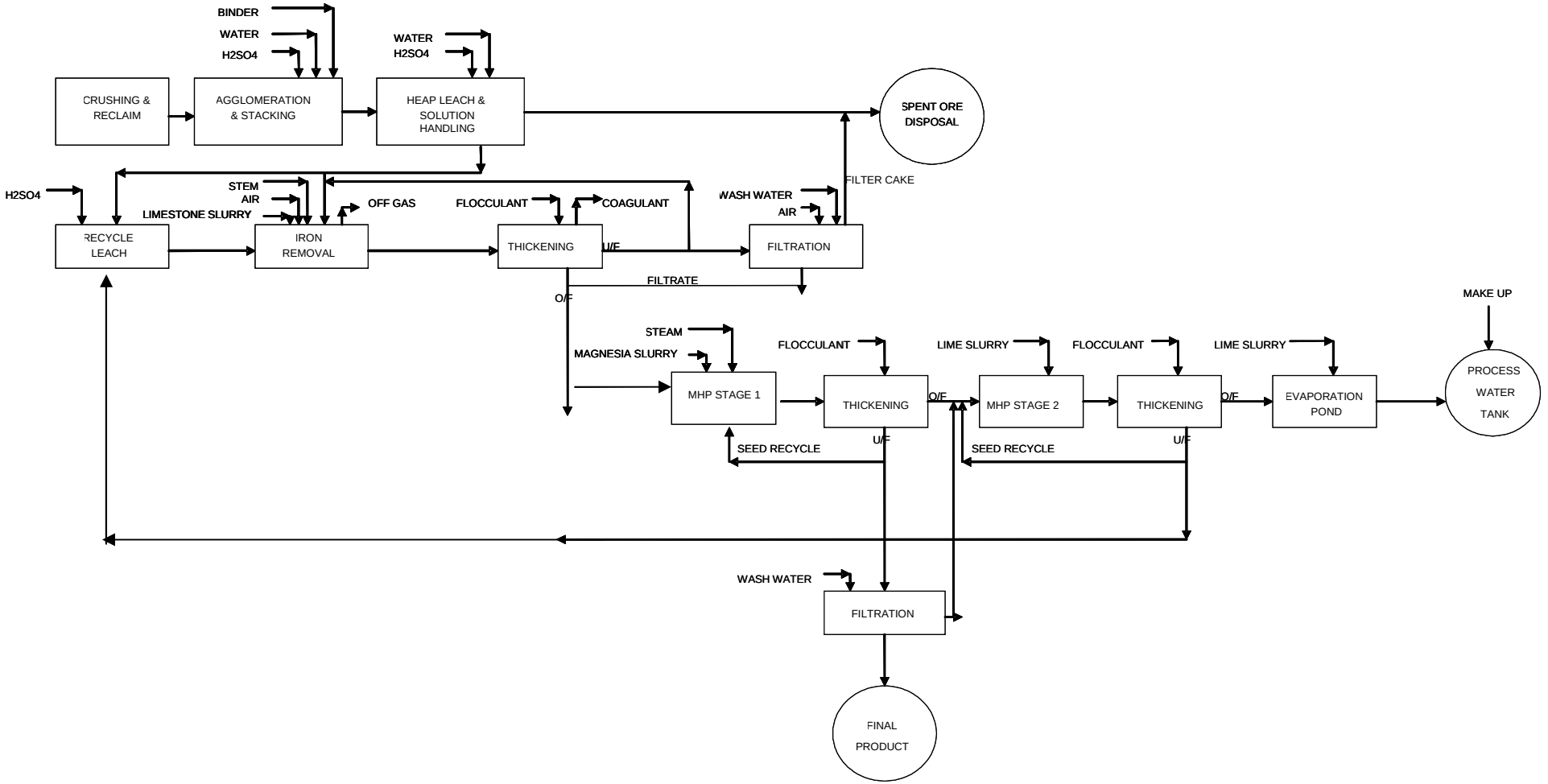


Figure 4: Simplified Process Diagram

Figure 5: Conceptual Processing Diagram



2.5.4 Iron Removal

The purpose of the iron removal circuit is to neutralise free sulphuric acid and precipitate impurities such as iron, aluminium and chromium. This is carried out in a series of agitated tanks where limestone is added to raise the pH of the solution to a level where the iron and other impurities are precipitated as a solid while the nickel and cobalt remain in solution. The iron precipitate is co-disposed in the mining voids.

2.5.5 Nickel and Cobalt Precipitation

The first stage of precipitation of nickel and cobalt hydroxides is carried out in a series of agitated tanks where magnesia slurry is added to raise the pH of the solution to a level where the nickel and cobalt hydroxides are precipitated as solids but manganese remains in solution. The resulting slurry is thickened and filtered to produce mixed hydroxide precipitate.

A second stage of precipitation is carried out in a further series of agitated tanks, where lime is added to raise the pH of the solution. Most of the remaining nickel and cobalt is recovered as hydroxides and some basic sulphates.

2.5.6 Evaporation Pond and Process Water

The overflow from the second stage of precipitation is neutralised by lime slurry in the evaporation pond, with some water decanted for use as process water. The resulting brine salts are co-disposed in the mining voids.

2.5.7 Spent Ore

At the completion of the leaching cycle, the spent ore is irrigated with water to neutralise the process acid. Once flushed and drained, the spent ore has chemical characteristics similar to before it was extracted, with the exception being the lower concentrations of nickel, cobalt and other metals.

Once flushed and drained, the spent ore is removed from the heap leach pad and co-disposed with the waste precipitate from the iron removal stage (Section 2.5.5) and the brine salts from the mixed hydroxide precipitation stage (Section 2.5.6) into the mined out pit voids. If the voids do not provide sufficient space, a tailings dam will be constructed to accommodate the excess waste.

2.6 ASSOCIATED INFRASTRUCTURE

2.6.1 Sulphuric Acid Plant

The acid plant contains a conventional evaporative cooling water tower, and three days of sulphuric acid storage. The principal steps in the sulphur burning acid plant consists of burning sulphur in air to form sulphur dioxide, combining the sulphur dioxide with oxygen to form sulphur trioxide, and combining the sulphur trioxide with water to form a solution containing sulphuric acid. The oxidation and absorption steps in the manufacture of sulphuric acid from sulphur are all highly exothermic.

The excess heat generated at each step of the process is recovered in a waste heat boiler, superheater and economisers. The heat is recovered in the form of high pressure superheated steam which is mainly used for power generation. The process is designed to give a conversion of sulphur dioxide to sulphuric acid of more than 99.5%. It is anticipated that the sulphuric acid plant will produce sufficient steam for the process requirements plus steam for generation of the electrical power requirements of the processing plant, an estimated load of 10.0 megawatts (MW).

The sulphuric acid requirement will be approximately 406,000 tpa, which will require the burning of approximately 135,000 tpa of sulphur.

2.6.2 Limestone Plant

High quality limestone for the limestone plant will be supplied from deposits in the vicinity of the Project site. Alternatively, high quality pulverised limestone can be supplied from Miriwinni Lime near Mt Garnet.

The limestone plant provides a neutralisation medium to the process in the form of 30% solids by weight of ground limestone slurry. The Project plant will use approximately 350,000 tpa of limestone.

2.6.3 Lime and Magnesia Plant

The lime slaking plant converts purchased quicklime into slaked milk-of-lime slurry using a package lime slaking mill. After slaking, the lime slurry is stored in a milk-of-lime storage tank prior to distribution as required. The Project plant will use approximately 96,000 tpa of slaked lime.

The magnesia plant produces 20% w/w magnesia slurry for use in the mixed hydroxide precipitation. As magnesia slurries degenerate in reactivity with time, the retention time in the magnesia slurry tank is limited to 10 minutes.

2.6.4 Waste Rock

Although the nickel laterite deposits are more or less on the surface, there is a requirement to remove waste rock to ensure safe pit design and access to the pits. At an assumed waste to ore ratio of 0.5:1, approximately 7.5 Mt of waste will be stripped during the life of the Project.

While the waste rock dumps are being constructed, a bund wall will be in place around the toe of the dump to contain water runoff and sediments during storm events. Should sediment dams also be required down slope of the waste rock dumps then these will be constructed to prevent sedimentation of surrounding areas. The waste rock dumps will be progressively rehabilitated as areas become available.

It is anticipated that some waste rock material will be disposed of in the mining voids to minimise the disturbance footprint. Waste rock material may also be used for the construction of a tailings dam, should there be insufficient capacity in the mining voids for disposal of waste products (Section 2.5.8).

2.6.5 Site and Haulage Roads

Where possible, the alignment of existing tracks will be used to create roads of an appropriate width and surface to facilitate use by mine vehicles.

Consultation with the Herberton Shire Council and the Department of Main Roads will be undertaken regarding the use, maintenance and upgrading of existing roads.

2.6.6 Water requirements

The water supply requirements for the combined process activities, dust suppression and domestic use is estimated at approximately 2 million m^3 per annum and accounts for plant usage, evaporation, seepage and product moisture.

A reliable water supply is available from the Herbert River via a pipeline to the Project site. Other options to supplement the Project water supply are currently being investigated, and may include:

- A groundwater borefield;
- Construction of a weir on Bell Creek;
- A valley impoundment within the ML; and
- Use of a pit void at the Bell Creek North West deposit to store water harvested from Bell Creek.

Appropriate licenses will be obtained from the relevant authorities for the chosen water supply option/s. Design details and an assessment of impacts will be described in the EIS.

2.6.7 Power Supply

It is estimated that the proposed operation will require approximately 10 MW per hour. As described in Section 2.6.1, the sulphuric acid plant involves a highly exothermic reaction which will generate the required power for the Project. If there is excess power generated, this may be sold into the North Queensland electricity grid.

2.6.8 Staffing and Accommodation

The Project will employ a total of approximately 132 staff. The personnel required for each area is shown in Table 3.

Table 3: Personnel by Area

Area	Personnel
Crushing, Screening, Agglomeration	9
Heap Leach	9
Process Plant	72
Other Utilities and Infrastructure	5
Maintenance	19
Administration and General Management	18
Total	**132**

A permanent on site camp has been proposed that will accommodate, at its peak, approximately 120 operational personnel including contractors, . The proposed location of the camp is shown in Figure 3.

2.7 REHABILITATION

2.7.1 Exploration

Exploration disturbances will be rehabilitated as per the following steps:

- Capping the drill hole;
- A drying out period to allow water to evaporate from the drilling muds in the sumps;
- Backfilling of drilling sumps;
- Scarifying the surface; and
- Should natural regeneration not be successful after the first year, seed from suitable pasture species will be sown before the following wet season to enhance revegetation.

2.7.2 Heap Leach Pad

Once commercially viable quantities of marketable nickel-cobalt concentrate can no longer be leached from a heap leach panel, the heap will be rinsed, drained, compacted and profiled. The heap will then be encapsulated with suitable structure and type of material and revegetated.

2.7.3 Waste Rock Dumps

The final rehabilitation plan for waste rock dumps will be detailed in the EIS and Environmental Management Plan (EM Plan). Conceptual planning has assumed the final slope of the waste rock dump face to be between the angle of repose and 20 degrees depending on the competency of the waste material. Where necessary, berms will be constructed on the outer faces and graded to slope back towards the dump to act as a water control structure for any stormwater flowing off the lift above.

The slopes and top of the dumps will be topsoiled where possible and deep ripped to bind in the material. Revegetation will use species suitable for the final land use.

2.7.4 Final Voids

The final pit voids will either be backfilled with spent ore (including co disposal of filtered iron hydroxide product and brine salts) or backfilled waste overburden material or left in a safe condition by constructing a safety bund wall around the perimeter from competent rock and/or fencing, depending on the terrain.

The safety bund wall will be constructed as described in *Technical Guidelines for the Environmental Management of Exploration and Mining in Queensland*. This guideline states that the bund wall should

be of a minimum height of 2 m, with a minimum base width of 4 m and be located at least 10 m beyond the area potentially affected by any instability of the pit edge.

Where water quality within the void is suitable for stock, a safe access to the water shall be provided for stock, or the water will be pumped to a stock watering point. Consultation with the land holder will be undertaken to determine the best means of pumping or access. Where water in voids is not suitable for stock then the voids will be bunded or fenced to prevent stock access.

2.7.5 Plant and Infrastructure

All process plants and associated buildings and equipment will be dismantled and removed upon the cessation of mining operations or by agreement, left for the land holder.

2.7.6 Access Roads

Access roads required for pastoral activities will not be rehabilitated. This will be confirmed by written agreement with the landholder. Roads that can be rehabilitated will be deep ripped and where appropriate seeded with a mix of species suitable for the intended land use.

2.7.7 Revegetation Methods

Surface preparation before revegetation will include surface contouring, ripping and topsoil spreading. Surface contouring will occur to minimise soil erosion. Contour ripping to a depth of 200-500 millimetres (mm) will then take place by dragging tines behind a bulldozer to break up the compacted soils after mining activities. Topsoil will be stockpiled for use in rehabilitation as it contains organic material and local seed banks. Preserved topsoil will be spread to a thickness similar to the original topsoil or an average of 0.2m (where possible).

After appropriate surface preparation has occurred as outlined above, disturbed land will be revegetated as follows:

- Spread fertiliser and/or other ameliorates, such as gypsum at an appropriate rate, if required;
- Native species occurring naturally in the local area will be chosen for areas requiring the re-establishment of local native habitat;
- Where an agricultural land use is planned, the species planted will be those commonly used for pasture known to be successful on soils of similar texture;
- Where practicable, revegetation will occur through direct seeding of selected species. Where direct seeding is not possible (e.g. small areas with limited access), seeds will be manually broadcast;
- A Weed Management Plan will be implemented to ensure revegetation initiatives are balanced with managing any weed species existing or which are established due to land disturbance.

2.8 ENVIRONMENTALLY RELEVANT ACTIVITIES

Table 4 describes the Environmentally Relevant Activities (ERAs) proposed to be conducted on the Project, which would otherwise be ERAs as per Schedule 1 of the *Environmental Protection Regulation 1998* if the Project was not a mining project.

The process of mining mineral ore (Mining Activities) is not covered by an ERA in Schedule 1 of the Regulation; it is covered separately by Schedule 6, Part 2 of the *Environmental Protection Regulation, 1998.*

Table 4: ERAs Associated with the Project

Item (ERA Schedule No.)	Level of Activity	Level	License Fee ($)
ERA 6(b) Chemical Manufacturing, Processing or Mixing	> 100,000 t per year	1	5,820
ERA 7(b) Chemical Storage	>1000m^3 or more	1	1,740
ERA 11(a) Crude Oil or Petroleum Product Storing	<500,000L	2	-
ERA 15(b) Sewage treatment	Sewage treatment for between 100 and 1500 equivalent persons	1	1,500
ERA 17 Fuel Burning	Using fuel burning equipment capable of burning more than 500kg or more of fuel an hour	1	3,000
ERA 18(b) Power	Generating power by consuming fuel at a rated capacity of 10 MW electricity or more	1	14,940
ERA 42 Mineral Processing	Commercially processing, classification, mixing or concentration of mineral ores to produce mineral concentrates in works having a design production capacity of more than 100,000tpa	1	16,340

3.0 DESCRIPTION OF THE EXISTING ENVIRONMENT

3.1 REGIONAL CLIMATE

This climatic description of the region in which the Project site is located has been compiled using the closest available data collected by Australian Bureau of Meteorology (BOM) (http://www.bom.gov.au/). Temperature averages are sourced from the closest BOM weather station at Herberton Post Office approximately 55km north-west of the Project site. These records are averaged from over 100 years of data for the region. Rainfall data is sourced from the Gunnawarra weather monitoring station which is within 5km of the Project site. Data from this station was also collected for approximately 100 years.

Figure 6 shows that the coolest temperatures occur from June to August with the mean minimum daily temperature ranging from 9.7°C to 18.2°C. The highest temperatures occur from November to February and range from 21.4°C to 28.9°C. These patterns are typical of a sub-tropical region experiencing defined wet/dry seasons.

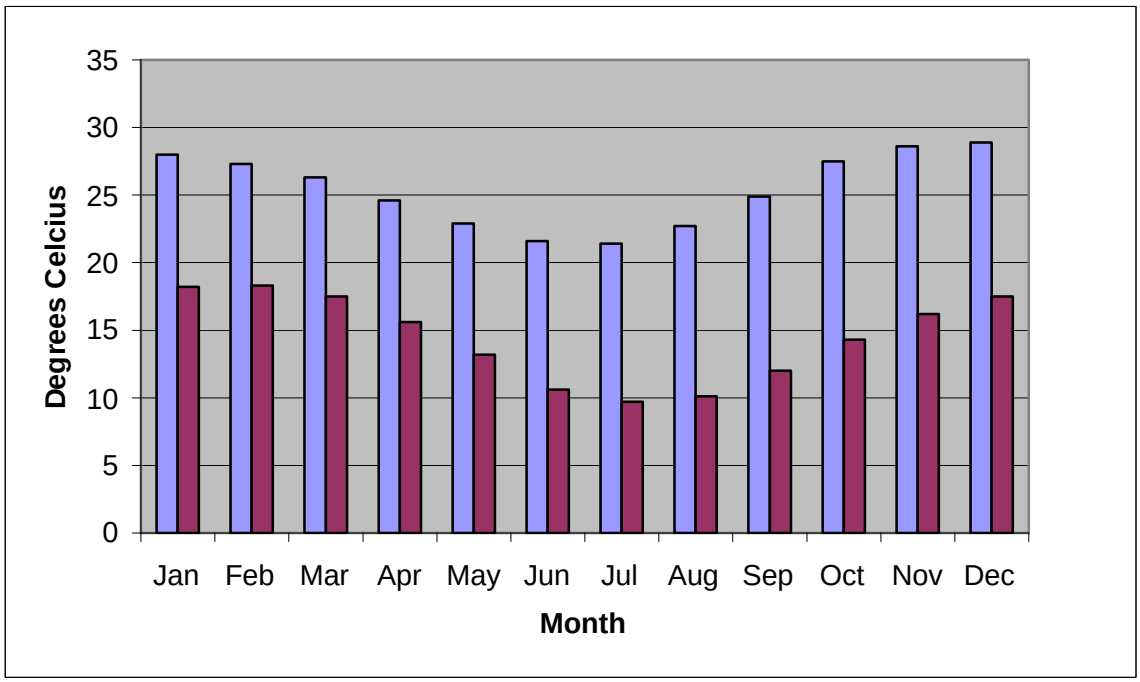


Figure 6: Mean Monthly Temperatures at Herberton Post Office

Rainfall data from the Gunnawarra weather monitoring station indicates that mean annual rainfall for the region is approximately 758.6 mm. Figure 7 illustrates that rainfall is typically highly seasonal, with the dry season peaking between July and September and the wet season peaking in January and February.

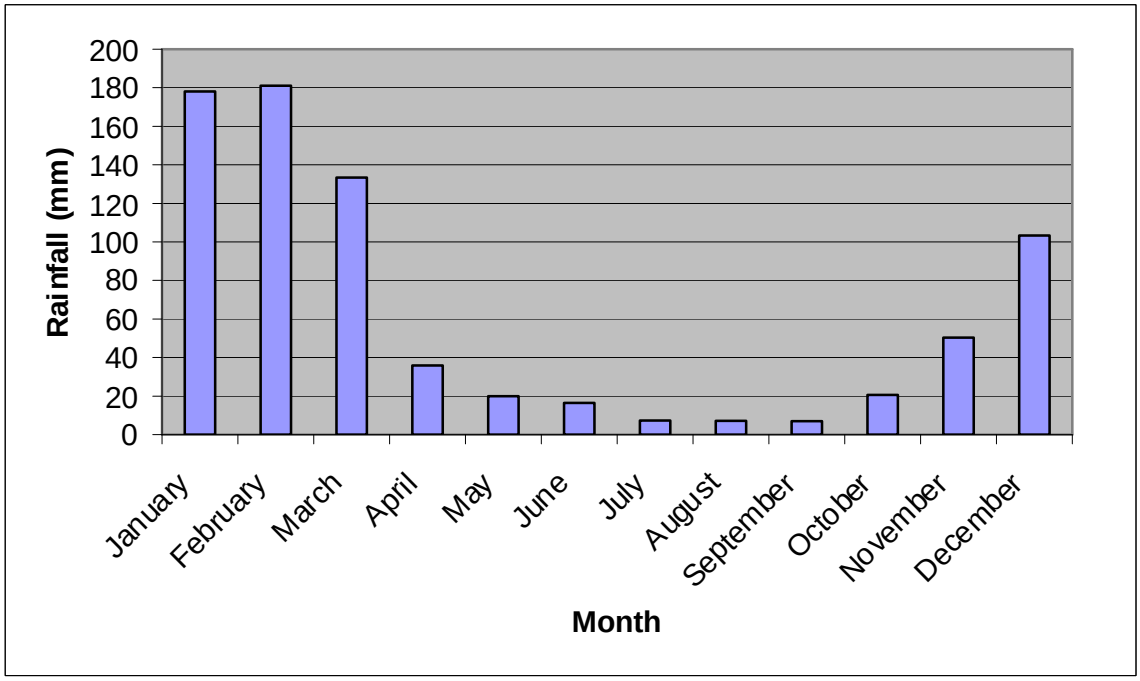


Figure 7: Mean Monthly Rainfall at Gunnawarra

Light winds of less than 10 kilometres per hour (km/hr) from an eastward direction are dominant in the region. Wind roses for the region as measured at Georgetown (approximately 150km south-west of the Project) are shown in Figure 8.

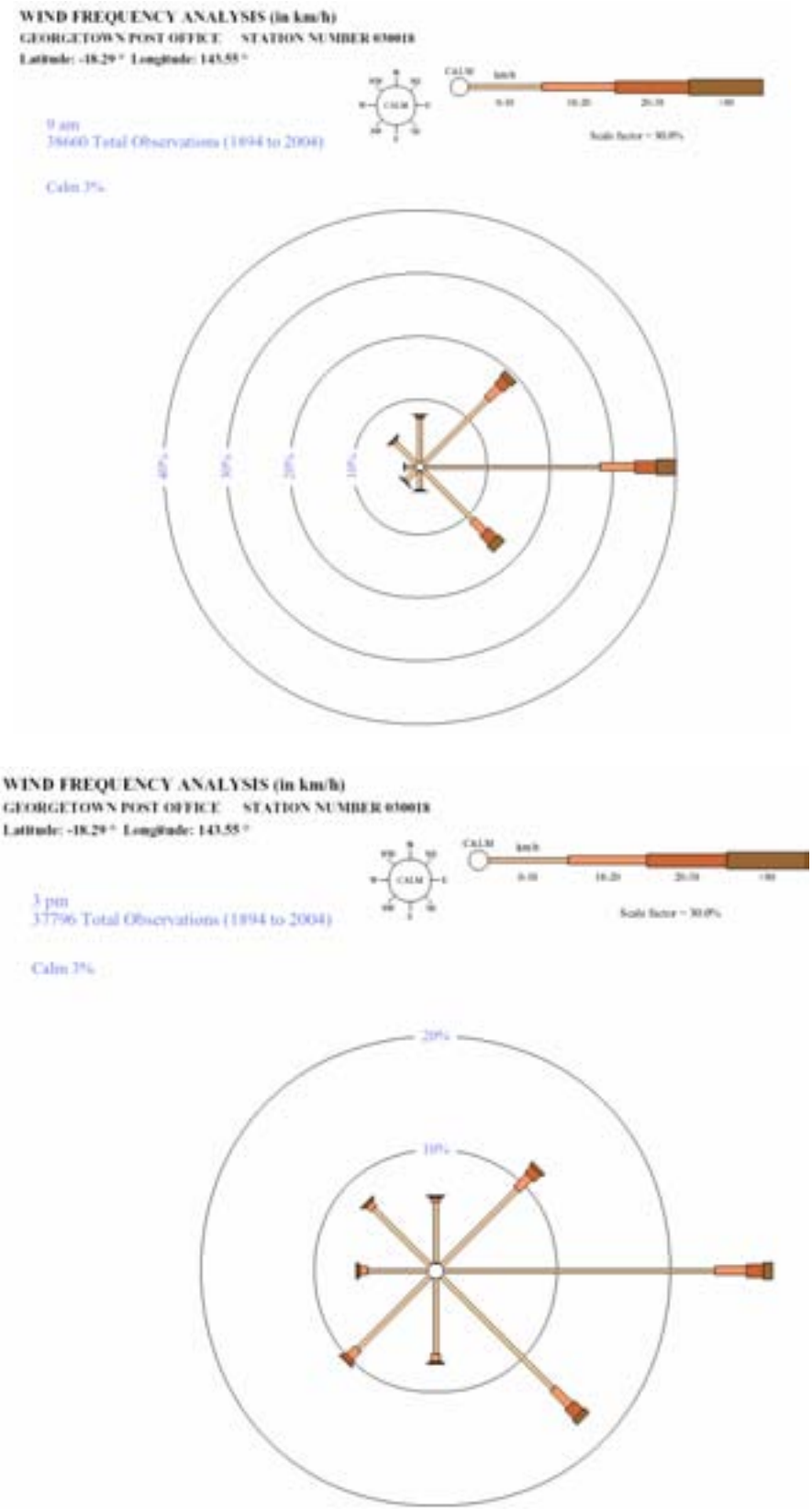


Figure 8: Wind Roses Measured at Georgetown

3.2 CURRENT LAND USE

The current use of the land is low intensity cattle and horse grazing, and mineral exploration.

3.3 GEOLOGY

At Bell Creek, a number of ultramafic bodies have been deeply weathered to form nickel laterites. These are classified as part of the Sandalwood serpentinite and have been intruded along north-north-east trending faults. Discrete aplite dykes have intruded into the serpentinites and are probably related to granite intrusives which occur in the western and eastern parts of the tenement. The north and northwestern parts of the tenement are covered with either quaternary sediments or basalts of the McBride formation. A simplified geology map of the Bell Creek area is shown in Figure 9.

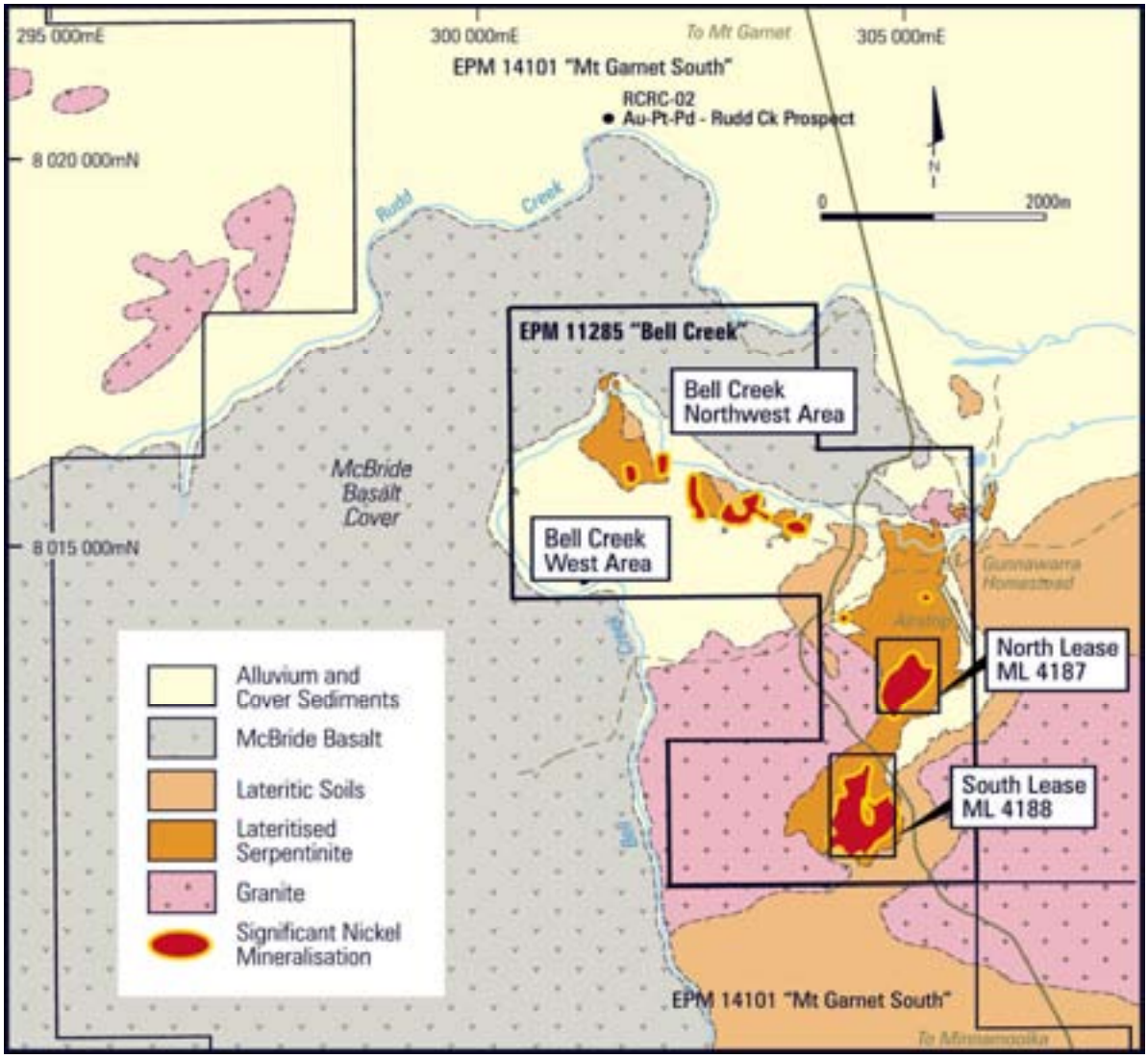


Figure 9: Geology of the Bell Creek Region

The nickel mineralisation at Bell Creek occurs throughout the laterite profile, which varies from an upper ferruginous crust, to an underlying limonitic zone and a basal weathered serpentinite, saprolite zone. These zones represent quite different types of mineralisation. The crust is siliceous and commonly forms vuggy box-work material, generally with a low iron/silica ratio. Limonitic ores are generally above the saprolite zone and have high iron and low magnesium content and can contain high grade cobalt. The saprolite zone generally has high magnesium and iron levels and can contain high nickel values.

Although the nickel laterite deposits are more or less on the surface, there is a requirement to remove waste rock to ensure safe pit design and access to the pits. Due to the geology of the ore body, it is unlikely that the waste rock will have acid producing potential. Waste rock samples are being collected as part of further test work and results will determine detailed design of dumps and associated environmental impact mitigation strategies.

Waste rock samples will be analysed for the following parameters to determine their acid producing potential:

- pH(OX);
- Net Acid Generation (NAG) Capacity (kg H_2SO_4/tonne);
- % Total Sulphur;
- Acid Neutralising Capacity (ANC) (kg H_2SO_4/tonne); and
- Net Acid Producing Potential (NAPP) (kg H_2SO_4/tonne).

3.4 ENVIRONMENTALLY SENSITIVE AREAS

A search of the QEPA Ecoaccess database (http://www.epa.qld.gov.au/ecoaccess/ecomaps) for Environmentally Sensitive Areas shows that the Project site covers a Queensland Heritage Register Place, which is listed in the *Environmental Protection Regulation 1998* as a Category B Environmentally Sensitive Area (Figure 10). This Register Place is the Gunnawarra Homestead, and is discussed in more detail in Section 3.10.

There are no other Environmentally Sensitive Areas pertinent to the Project.

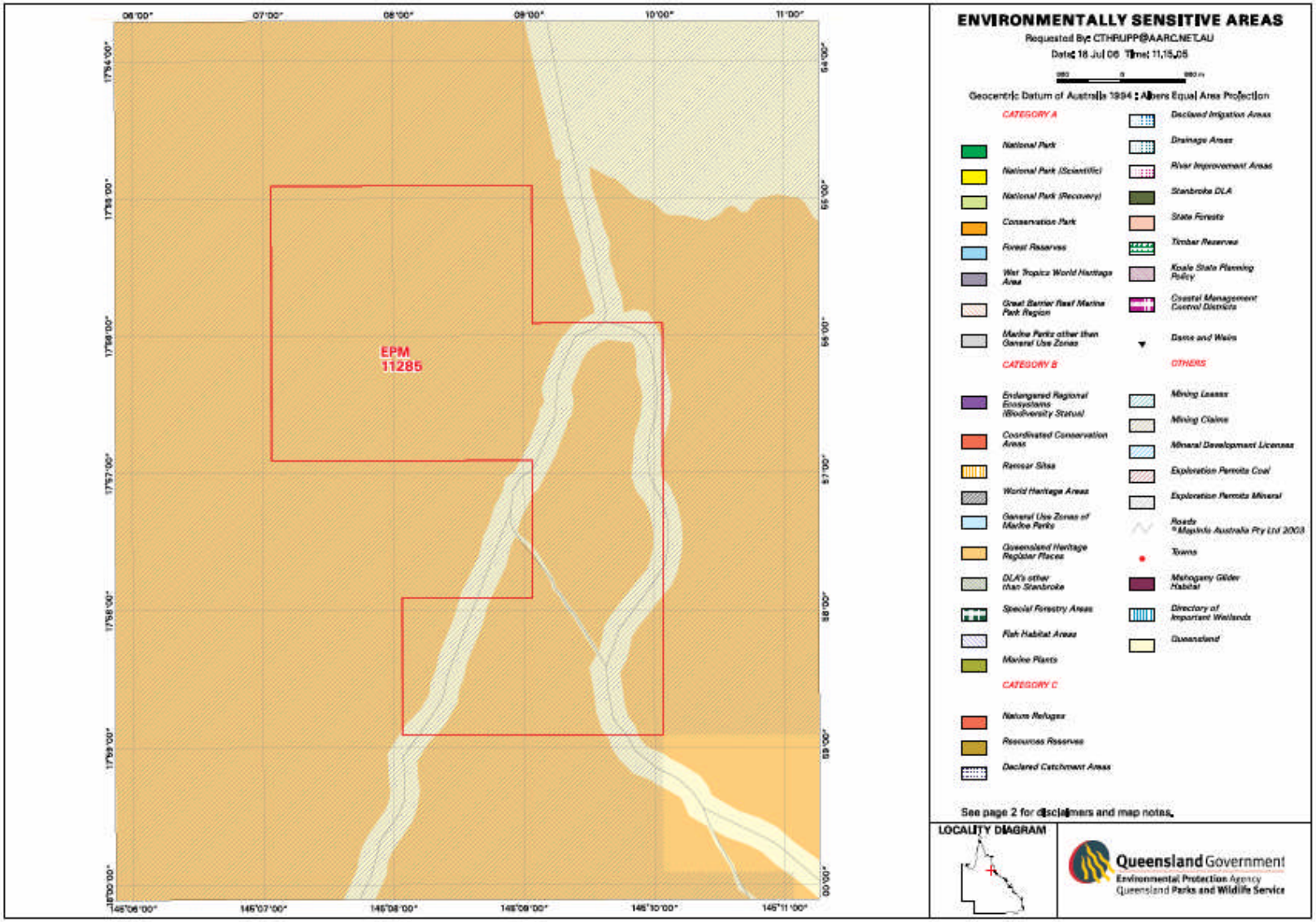


Figure 10: Environmentally Sensitive Areas Map

3.5 SURFACE WATER AND DRAINAGE

The Project is located within the Herbert Catchment which flows in an easterly direction to the Pacific Ocean. The Herbert catchment is not currently declared or nominated for declaration under the *Wild Rivers Act 2005*.

Bell Creek forms the dominant waterway within the MLA boundary. The ephemeral creek flows in a north-east direction and is drained by the Herbert River approximately 8 km to the east of the Project Site. The Herbert River flows south east and empties into Mulligan Bay approximately 100 km north of Townsville.

The flow of ephemeral creeks and rivers within and surrounding the Project site is restricted to heavy rainfall events, which typically occur between the months of November to March. Due to their ephemeral nature, the use of watercourses within the vicinity of the Project is generally limited to stock watering, when water is available.

Rising Stage Samplers will be installed on the Project site in early 2007 to collect background water quality data from Bell Creek, at sites both upstream and downstream of the proposed MLA.

3.6 SOIL AND LAND SUITABILITY

Soil sampling was undertaken as part of a soil and land suitability assessment of the Project site, in accordance with the Department of Minerals and Energy Land Suitability Assessment Techniques (1995). In following the procedures outlined in this guideline, the objectives of the study will be to:

- Compile a land resource inventory through classification, testing and mapping of soils, and description of the terrain; and
- Determine and report on the pre-mining land suitability through the process of land resource evaluation.

3.7 NATURE CONSERVATION

A detailed terrestrial flora and fauna survey was undertaken on the Project site from 30th September to 6th October 2006 to collect baseline information on the flora and fauna values of the site. This was the first study in a series of two seasonal studies to cover both the dry and wet seasons.

The survey was conducted during the latter half of the dry season. As a result, the majority of creek beds within the Project Site were dry, and any standing water that was present was restricted to shallow, contained pools along the western and southern borders. The weather consisted of warm days and nights, and no rain fell during the survey.

The survey included the following scope of works:

- A literature and database search to identify species of State and National conservation significance known from the region. This enabled these species to be targeted during the field survey component of the study; and

- A field survey employing standard methodologies to determine the composition of flora and fauna species inhabiting the Project Sites, particularly species of conservation significance. This included:
    - Regional Ecosystem mapping;
    - Identification of flora species at representative transects;
    - Pitfall trapping with drift fences;
    - Elliott trapping;
    - Ultrasonic bat call detection using the ANABAT II bat detector;
    - Bird census;
    - Track, scat and scratch searches;
    - Habitat searches for reptiles and amphibians; and
    - Recording of opportunistic flora and fauna sightings outside transects.

3.7.1 Fauna

A total of 73 fauna species were observed on the Project site, comprising 51 bird species, 14 mammals, seven reptiles, and one amphibian.

Amphibians

One amphibian species was observed during the survey period. The introduced Cane Toad (*Bufo marinus*) was observed during active searching and spotlighting activities at the pastoral dam. The low numbers of observed amphibians is likely due to the lack of standing water present on the Project site. The future wet season survey is anticipated to provide more amphibian recordings.

Birds

A total of 51 bird species were observed on the Project Site during the survey. A further two species (the Galah – *Cacatua roseicapilla* and the Apostlebird – *Struthidea cinerea*) were seen in the vicinity of the Project Site. Due to the dispersive nature of birds, it is highly likely that these two species would inhabit the Project site periodically.

The most commonly encountered granivorous bird species was the Pale-headed Rosella (*Platycerus adscitus*). Other granivores identified during the survey included such species as the Common Bronzewing (*Phaps chalcoptera*), and the Red-tailed Black Cockatoo (*Calyptorynchus banksii*).

Three raptor species were observed during the survey – the Whistling Kite (*Haliastur sphenurus*), the Wedge-tailed Eagle (*Aquila audax*), and the Nankeen Kestrel (*Falco cenchroides*). All three species were observed circling open woodland areas.

Wetland birds were commonly observed at the dam and marshland on the Project site. These included the Australian Wood Duck (*Chenonetta jubata*), the Darter (*Anhinga melanogaster*), and the Comb-crested Jacana (*Irediparra gallinacean*).

The most common types of birds encountered were insectivorous, and included such species as the Australian Magpie (*Gymnorhina tibicen*), the Pied Butcherbird (*Cracticus nigrogularis*), the Australian Bustard (*Ardeotis australis*), and the Spotted Nightjar (*Eurostopodus argus*). The wide array and abundance observed in these birds is due to the readily available prey, and their ability to colonise all available habitats.

Reptiles

A total of seven reptiles were observed on the project site, comprising two snakes, three skinks, one gecko and one varanid species. The Carpet Python (Morelia spilota), was not observed by AARC during the survey however communication with the station owner indicated that this snake species was frequently observed in the area, and an individual had been relocated by the station owner during the survey period.

Mammals

A total of 14 mammal species were identified from the Project site during the survey. A further two species (the Short-beaked Echidna – *Tachyglossus acculeatus* and the Rufous Bettong – *Aepyprymnus rufescens*) were observed in the vicinity of the Project site.

The most commonly observed were macropods including the Black Wallaby (*Wallabia bicolor*), the Whiptail Wallaby (*Macropus parryi*), and the Eastern Grey Kangaroo (*Macropus giganteus*).

The arboreal Brushtail Possum (*Trichosurus vulpecula*) was observed during spotlighting activities in riparian woodland locations throughout the Project site.

Two bat species are thought to occur on the site and analysis of ANABAT recordings will be used to confirm these species.

Three introduced species were observed on the Project Site. The Black Rat (*Rattus rattus*) was caught in Elliott traps on two occasions. The European Rabbit (*Oryctolagus cuniculus*) was commonly observed during spotlighting activities. A number of Pigs (*Sus scrofa*) were observed near the pastoral dam during an early morning bird survey.

Conservation Significance

Two bird species observed during the survey are listed in the EPBC Act as Marine Overfly. These are the Cattle Egret (*Ardea ibis*) and the Rainbow Bee-eater (*Merops ornatus*).

No other species of conservation significance were observed during the survey.

3.7.2 Flora

Four mappable vegetation communities were identified on the Project Sites during the AARC study:

Community 1 – Narrow leaved Ironbark Open Woodland

Remnant vegetation areas dominated by Narrow Leaved Ironbark Open Woodland occur on Rocky Brown to Black soils on the Southern half of the Project Site.

This community is dominated by Narrow Leaved Ironbark to a height of approximately 20m. Patches of Gum Topped Bloodwood were present throughout this community but were too small to map at this scale. The understorey layer was dominated by Yellow Wattle and Beefwood, and also had immature canopy species present. The grass layer was sparse with an average grass cover of approximately 30%, with leaf litter made up a majority of the remaining cover.

Community 2 – Reid River Box Open Woodland

Remnant vegetation areas dominated by Reid River Box Open Woodland occur on hard sandy grey brown soils. These forests occur throughout the Project Site and are the dominant vegetation community on the northern half of the survey area.

The fifteen to twenty metre high canopy of this community is dominated by Reid River Box, with individual Poplar Gum, Gum-Topped Bloodwood and Silver-leaved Ironbark scattered throughout the community. The understorey consists of Wattle species, and paperbarks with juvenile canopy species also present. The groundcover consists of *Eragrostis* species, Black Speargrass, and Wiregrass Species.

Community 3 – Narrow leaved Ironbark with Cypress Woodland

Narrow leaved Ironbark with cypress woodland was located in a small patch close to Bell Creek on the eastern side on the Project.

The community is dominated by Narrow leaved Ironbark with secondary occurrences of Reid River Box and Gum-Topped Box. Cypress Pine forms a distinct midstorey through this community with some emergent in the canopy. The understorey is dominated by Quinine trees and immature canopy species. The groundcover is dominated by Dark Wiregrass and Black Speargrass.

Community 4 – River Oak Riparian Woodland

River Oak Riparian Woodland forms a narrow fringe along Bell Creek, on the north and west sides of the project. This community is a common feature of watercourses in the region.

At fifteen to twenty metres, River Oak almost entirely dominates the canopy of this community. There are sparse individual River Red Gums also present in the community. The shrub layer consists of Hakea and Acacia species. The ground cover is dominated by Kangaroo grass on the creek banks with Lovegrass and Red Natal dominating as distance increases from the creek bank.

Conservation Status

No vegetation communities listed under the *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth) were identified on the Project Sites. All vegetation communities were classed as “Not of Concern” under the *Vegetation Management Act 1999*.

Two Regional Ecosystems identified on the Project site are listed as being Of Concern under the Queensland Environmental Protection Agency (QEPA) Biodiversity status:

- 9.3.1 River Oak Riparian Woodland (Community 4)
- 9.3.5 Reid River Box Open Woodland (Community 2)

The River Oak Riparian Woodland is listed as "of Concern" under the Queensland EPA Biodiversity Status due to Rubber vine (*Cryptostegia grandiflora*) infestation and total high grazing pressures are leading to degradation. Timber harvesting is removing significant habitat trees.

The Reid River Box Open Woodland is listed as "of Concern" under the Queensland EPA Biodiversity Status due to high total grazing pressure and land clearing.

No Threatened flora species were identified during the field survey.

Two weed species declared under the *Land Protection Act 2002* (Queensland) were recorded during the survey. Rubber vine was recorded on Bell Creek and around some pastoral dams and Lantana was recorded in one location on the pipeline corridor from the Herbert River.

A second survey (wet season) will be undertaken in early 2007.

3.8 NOISE AND AIR

The closest sensitive receiver in the vicinity of the Project site is the Gunnawarra Homestead, located approximately 1 km east of the eastern MLA boundary.

Noise studies will include the deployment of background environmental noise loggers to obtain noise levels representative of the region under typical circumstances. Noise levels from the Project, and the potential impact on sensitive receivers, will be predicted based on the proposed mine plan. Modelling will be undertaken to assess the impact of noise and vibration on the sensitive receivers identified.

Dust from disturbed areas and haul roads, and emissions from the acid plant, are expected to be the primary air quality issues for the Project. Dust deposition gauges will be installed on the Project site to collect background levels representative of the region under typical circumstances. Air quality modelling will be undertaken to predict the impact of dust levels and emissions on sensitive receivers during Project operations.

3.9 INDIGENOUS CULTURAL HERITAGE

The registered native title claimants for the Project site are the Warrungnu #2 People.

In accordance with the *Aboriginal Cultural Heritage Act 2003*, the Warrungnu native title claimants were consulted regarding the development of a Cultural Heritage Management Plan (CHMP) for the Project, and on 13th October 2006 were endorsed by Metallica Minerals to take part in the development of the CHMP.

Site inspections by representatives of the Warrungnu group and a qualified archaeologist are planned for March 2007, and negotiations regarding the development of the CHMP are ongoing.

3.10 EUROPEAN CULTURAL HERITAGE

The underlying real property parcel (Lot 5 on GU58) is entered in the Heritage Register as per Part 3 Section 30 of the *Queensland Heritage Act 1992*. The register entry is described as Gunnawarra Homestead, located at Gunnawarra Rd, Mount Garnet.

The pastoral property of Gunnawarra was established by Europeans in 1865. The property is considered to be of cultural heritage value in that it has remained in continuous use throughout the development of the pastoral industry in Queensland, and illustrates evidence of building techniques and farming practices employed throughout this period.

The Project will be developed in close consultation with the landholders of Gunnawarra, which will remain an occupied family residence and operating property. The buildings and infrastructure that comprise the homestead are located outside of the MLA area, and no impact or alteration to these structures is expected.

4.0 COMMUNITY CONSULTATION

4.1 INTERESTED PERSONS

The following definition of interested persons has been taken from the QEPA *Guideline 12 – The EIS Process for Non-standard Mining Projects.*

"Interested persons are defined as persons nominated by the proponent that have an interest in the Project. Interested persons may include a local community progress association, a local/state/national environmental action group, and affected land users other than land holders, any person who might have a substantial interest in the project or its impact."

Interested persons for the Project may include, but not be limited to, the following groups as stated in Table 5 below.

Table 5: Interested Persons

Name of Interested Person or Organisation	Relationship to Project	Contact Details
Herbert River Catchment Group Inc, Ripple Creek	Catchment Group encompassing the Project region	Naomi Phillips c/- PO Box 1293 Ingham Qld 4850 Ph (07) 4777 2822
Upper Herbert River Catchment Group	Catchment Group encompassing the Project region	Upper Herbert Catchment Coordinator c/- FNQ NRM PO Box 1756 Innisfail Qld 4860
Ergon Energy	Administers the North Queensland electricity grid	PO Box 308 Rockhampton Qld 4700
Mt Garnet District Land Care Group Inc.	Interest group for the Project region	c/- Ros Burtenshaw PO Box 35 Mt Garnet Qld 4872

4.2 AFFECTED PERSONS

A definition of an affected person is provided in QEPA Guideline 12 – The EIS Process for Non-standard Mining Projects and is shown below:

A person is an "affected person" for a project (s38) if the person is:

(1) any of the following under the Native Title Act 1993 (Commonwealth) for the operational land or for an area that includes any of the land:

a) a registered native title body corporate;

b) a registered native title claimant;

c) a representative Aboriginal/Torres Strait Islander body; or

(2) a relevant local government for the operational land; or

(3) a person mentioned below for the operational land or any land joining it:

a) a registered proprietor - for freehold land;

b) a person recorded in the register as the registered holder of the interest - for land that is held from the State for an estate or interest less than fee simple and for which the interest is recorded in a register mentioned in the Land Act 1994 (Land Act), section 276;

c) a holder of, or an applicant for, the tenement - for land subject to a mining claim, mineral development licence or mining lease;

d) a holder of the authority; or a lessee under the lease; or a licensee under the licence - for land subject to an authority to prospect or a lease or licence under the Petroleum Act 1923;

e) a trustee of the land - for land under the Land Act or the Nature Conservation Act 1992 (NCA) for which there are trustees;

f) a grantee of the land - for Aboriginal land under the Aboriginal Land Act 1991 (ALA) that is taken to be a reserve because of section 87(2) or 87(4)(b) of that Act;

g) a trustee for the land - for DOGIT land under the ALA or the Torres Strait Islander Land Act 1991;

h) a relevant local government - for land held under a lease under the Local Government (Aboriginal Lands) Act 1978, section 6;

i) *a grantee of the land - for Torres Strait Islander land under the Torres Strait Islander Land Act 1991 that is taken to be a reserve because of section 84(2) or 84(4)(b) of that Act;*

j) *a trustee of the land - for land under a lease from the State under the Aborigines and Torres Strait Islanders (Land Holding) Act 1985 that has been excised from land granted in trust for Aboriginal or Torres Strait Islander purposes under the Land Act;*

k) *the State - for land that is any of the following:*

- *unallocated State land;*
- *a reserve under the Land Act for which there is no trustee;*
- *a national park, national park (Aboriginal land), national park (scientific), national park (Torres Strait Islander land), national park (recovery) or forest reserve under the NCA;*
- *a conservation park under the NCA for which there are no trustees;*
- *a State forest or timber reserve under the Forestry Act 1959;*
- *a State-controlled road under the Transport Infrastructure Act 1994;*
- *a fish habitat area under the Fisheries Act 1994.*
- *another person prescribed under a regulation to the EP Act.*

Affected Persons for the Project are shown in Table 6 below.

Table 6: Affected Persons

Name of Affected Person or Company	Relationship to Project	Contact Details
Giles and Sally Atkinson	Owners of Lot 5 on GU58	Gunnawarra Station Mount Garnet Qld 4872
Warrungnu #2 People	Registered Native Title Claimants	c/- Carmilla Smith PO Box 702 Castletown Hyde Park Qld 4812
North Queensland Land Council	Representative Aboriginal body	61 Anderson St PO Box 679N Cairns Qld 4870

Herberton Shire Council	Local Government	40 Grace St Herberton Qld 4887

4.3 CONSULTATION PROCESS

Affected and interested persons will be included in the community consultation program for the Project and will be provided with a copy of the Terms of Reference (TOR) Notice and EIS for public comment. The community consultation program will include meetings with affected and interested persons as required. All correspondence with interested and affected persons will be recorded in the Consultation Report as a part of the EIS.

The draft TOR will be released for public comment, and to interested and affected persons, and advisory bodies for at least 30 business days. Anyone can make comments on the draft TOR to the QEPA. At the end of the comment period, copies of all comments received by the QEPA will be given to the proponent. Metallica Minerals will then prepare the following:

- A written summary of the comments;
- A response to the comments; and
- Proposed amendments to the TOR as a result of the comments received.

The above information must be provided by Metallica Minerals to the QEPA within 20 business days of receiving copies of the documents. However, a longer period of time can be agreed between Metallica Minerals and the QEPA. The QEPA will then prepare and publish the final TOR based on the responses from Metallica Minerals within 20 business days.

Metallica Minerals will then undertake the necessary assessments, research and consultations to prepare the EIS, in accordance with the TOR. The EIS will support an application for Project approvals, in particular an Environmental Authority (EA).

Metallica Minerals will submit the completed EIS to the QEPA. The QEPA will then assess the EIS and decide whether or not it adequately addresses the published TOR. If it does, Metallica Minerals must then publish an EIS Notice and give a copy of the EIS Notice to each affected and interested person. The submission period for public comment will be set by the QEPA and must be at least 20 business days. Copies of the EIS will be made available to all interested and affected persons and Advisory Bodies. The QEPA will accept all properly-made submissions received during the submission period. The QEPA will provide Metallica Minerals with a copy of all the submissions received on the EIS. Metallica Minerals must then prepare a response to the submissions and make any necessary amendments to the submitted EIS.

The QEPA will prepare and give an EIS Assessment Report to Metallica Minerals. This Assessment Report will consider the final TOR, the submitted EIS, all properly made submissions, Metallica Minerals responses to submissions and the standard criteria in preparing the EIS Assessment Report. The Assessment Report will, among other things, recommend any relevant conditions that will be necessary for the Project to proceed.

5.0 ASSESSMENT OF EIS TRIGGER CRITERIA

Table 6 below contains an assessment of the Project against the QEPA's EIS Trigger Criteria as set out in *Guideline 4 – Deciding the Level of Impact Assessment for the Mining Industry*.

Table 7: EIS Trigger Criteria

EIS TRIGGER CRITERIA	TRIGGERED	COMMENTS
1. Significant Impact on Category A or B environmentally sensitive areas	No	Category B Queensland Heritage Register Place (Gunnawarra Homestead) is located near the Project site, but no significant impact on areas of historical significance is anticipated.
2. Involve any mining in a marine area	No	-
3. Involve any mining less than 500m landward from the highest astronomical tide	No	-
4. Require the construction of more than 150 new dwelling units	No	A camp is proposed to accommodate a maximum of 120 personnel.
5. Include any activity that would otherwise be a Level 1 ERA with an annual fee greater than $4000	Yes	Chemical manufacturing Power generation Mineral Processing (See Table 4)
6. Involve the mining of more than 2 million tonnes of mineral or run of mine ore per annum	No	-
7. Involve the abstraction of more than 2 million m^3 of water per annum from natural surfaces and/or groundwater sources	Yes	Annual water requirement estimated at 2 million m^3.
8. Result in more than 25ha remaining post mining in a non-beneficial land capability where an acceptable alternative may be feasible	No	-
9. Involve any non-standard mining activity less than 2 km from a town	No	-
10. Contain a dam that requires a dam failure assessment under the *Water Act 2000*	No	-
11. Include mining for uranium or asbestos	No	-

6.0 BIBLIOGRAPHY

Aker Kvaerner Australia (2006) *NORNICO Nickel Project Scoping Study*. Prepared for Metallica Minerals Limited, 2006.

QEPA (2000) *Guideline 4 – Deciding the Level of Impact Assessment for the Mining Industry,* Version 1, December 2000.

QEPA (2003) *Guideline 8 – Preparing an EMOS for Non-Standard Mining Projects*, Version 1.1, March 2003.

DME (1995) *Technical Guidelines for the Environmental Management of Exploration and Mining in Queensland.*