Dart Mining NL

Project Unicorn

Project Development Concept Report

August 2013

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Abbreviations

Abbreviation	Full Title
AHD	Australian Height Datum
ANCOLD	Australian National Committee on Large Dams
CHMP	Cultural Heritage Management Plan
CNG	Compressed natural gas
DEPI	Department of Environment and Primary Industries
DSEWPaC	Department of Sustainability, Environment, Water, Population and Communities
DTPLI	Department of Transport, Planning and Local Infrastructure
EES	Environmental Effects Statement
EPA	Environment Protection Authority
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
FFG Act	*Flora and Fauna Guarantee Act 1988*
FTE	Full Time Equivalent
GDE	groundwater dependant ecosystems
GHG	Greenhouse gas
GL	Gigalitres
ISO	International Standards Organisation
kV	Kilovolts
km	Kilometres
LNG	Liquefied natural gas
ML	Megalitres
MSS-DDTS	Murray Switching Station to Dederang Terminal Station
Mtpa	million tonnes of ore per annum
MW	Megawatts
RAPs	Registered Aboriginal Parties
TSF	tailings storage facility

1. Introduction

1.1 Purpose of this document

Dart Mining NL proposes to develop the Unicorn molybdenum deposit at a site approximately 17 km south east of Corryong in north east Victoria. The Unicorn Project (the Project), would involve open cut mining and processing of ore to produce molybdenum and copper /silver concentrates for export.

The Project is currently in the pre-feasibility stage following the completion of the scoping study in August 2012 which did not identify any technical flaws that would prevent the project from advancing to the next stage.

This report describes the current scope of the Project, in order to inform environmental assessments and approvals processes, including:

- the project elements including key options and alternatives being considered (refer Section 2);
- the project setting and the existing environmental values and assets within the project investigation area (refer Section 3);
- potential environmental issues associated with the Project as identified through a preliminary environmental issues screening exercise (refer Section 4);
- statutory approvals that are required or likely to be required for the Project (refer Section 5); and
- proposed future studies to be undertaken to inform project development and the assessment and approvals process (refer Section 6).

1.2 Scope and limitations

This report has been prepared by GHD for Dart Mining NL and may only be used and relied on by Dart Mining NL for the purpose agreed between GHD and the Dart Mining NL as set out in section 1.1 of this report.

GHD otherwise disclaims responsibility to any person other than Dart Mining NL arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report (refer section(s) 1.3 of this report). GHD disclaims liability arising from any of the assumptions being incorrect.

1.3 Assumptions

GHD has prepared this report on the basis of information provided by Dart Mining NL and others who provided information to GHD which has not independently verified or checked beyond the agreed scope of work. GHD does not accept liability in connection with such unverified

information, including errors and omissions in the report which were caused by errors or omissions in that information.

The issues identification workshop focused on the Unicorn Project concept design as defined in the 'Unicorn Molybdenum Project Scoping Study Report', September 2012. Any changes to the concept design have not been accounted for in the identification of key issues.

GHD has provided a general, high level assessment of likely planning and environmental approvals that may be required for the Unicorn Project. Any permitting or approval requirements under Victorian, New South Wales or Commonwealth legislation other than those listed in section 4.1 of this report have not been assessed.

2. Project scope

2.1 Project overview

The Unicorn Project involves mining a molybdenum, copper and silver porphyry. It is estimated that ten million tonnes of ore per annum (Mtpa) would be mined and processed over the 20 year mine life.

The Project would involve open cut, drill and blast mining and processing the ore to produce separate molybdenum and copper/ silver concentrates for sale. Bagged concentrate material would be trucked from site for approximately 172 km to the Ettamogah intermodal rail hub near Albury-Wodonga, where it would be loaded into containers and transported by rail to the Port of Melbourne.

Dart Mining is considering a range of mining and ore transport options including in-pit crushing, truck and shovel operations to an external crusher and transport to the process plant via either ore passes and underground conveyor decline or surface conveyor.

The Project would require a range of infrastructure for mining, ore processing and storing waste rock and tailings in the project area. Dart Mining has considered a range of alternative sites for the processing plant and tailings storage facility (TSF).

Dart Mining is also considering a range of power and water supply options. Electricity is likely to be be supplied via an upgrade and extension to the existing electricity network. Water is likely to be supplied from on-site sources including on-site surface water harvesting from the TSF and utilising groundwater surrounding the ore body. The potential for the water supply to be supplemented by water from bore fields in the vicinity of the project or pumped directly from the Murray River is also under investigation.

It is expected that up to 85 Full Time Equivalent (FTE) jobs would be created by the Project when operational. Personnel would be sourced primarily from Corryong and the surrounding region.

2.2 Mineral resource

Modelling of the Unicorn deposit estimated a total Measured, Indicated and Inferred Mineral Resource of 203 million tonnes at 0.06% Molybdenum. The deposit outcrops on the north and west slopes near to the top of Mount Unicorn. The deposit is approximately 400 m to 450 m in diameter, and is “open” at a depth of approximately 460 m from surface (400 m RL). The base of the resource model is situated similarly at the 400 m RL.

Molybdenum is both a traditional and new age / future metal with unique characteristics. Its primary use is as an essential metal in the manufacture of steel where it adds strength, hardness and toughness as well as increasing steel’s resistance to corrosion. Molybdenum also has a range of chemical uses including acting as s a catalyst to remove impurities, including sulphur, during crude oil production. It is also used in the paint and plastics industry.

Molybdenum has a growing use in the renewable energy sector where it is used in the manufacture of solar panels and has a potential use as the electrode plate for the separation of hydrogen and oxygen to produce hydrogen energy. Molybdenum is also used in nano technologies to make electrical goods smaller.

2.3 Project setting

The project area is located on Crown Land in State Forest approximately 17 kilometres southeast of Corryong in North East Victoria (see Appendix A). The project area comprises the mining investigation area and the Tailings Storage Facility (TSF) investigation area (see Appendix B). The next closest township to the project area is Khancoban to the north-west of the site in New South Wales. The closest main roads to the project area are the Benambra-Corryong Road to the east and the Murray Valley Highway to the north.

A number of potential alignments associated with power supply are currently being investigated. A broader power line investigation area within Victoria and NSW has been identified. Within this investigation area two potential or 'indicative' alignments have been identified based on different grid connection points. Both indicative power line alignments follow the same route to near the Victoria and New South Wales border. One alignment then follows to Upper Murray Road and River Murray north until the Upper Murray Road separates from the River Murray. This alignment then continues to follow the Upper Murray Road to a substation proposed to be constructed to the east of Corryong. The other alignment then crosses the River Murray and then follows the Indi North Road to the Swampy Plain River. This alignment then follows the Swampy Plain River east past the Khancoban to the Murray Switching Station located at Khancoban in NSW. The majority of the power line investigation area is located on agricultural land (see Appendix B).

The project area lies within the upper headwaters of the River Murray, or the "Upper Murray" catchment, within the Murray Darling Basin. The main sub-catchments feeding the River Murray in this area are Corryong Creek, Thowgla Creek and Biggara Creek systems (URS 2013). Waterways that intersect the project area include Teapot Creek, McCormack Creek, Bull Paddock Creek, Dinner Creek, Hayes Creek and Jarvis Creek.

The nearest National Park is the Alpine National Park, 6 km to the southeast of the project area and the Burbibyong Creek Reference Area lies 8.5 km to the west (see Appendix F). The Biggara Creek, Thowgla Creek and Nariel/Corryong Creek valleys north of the mine site have been cleared for agriculture, which mostly consists of dairy cattle grazing (URS 2013).

2.4 Project elements

2.4.1 Mine process

Two mining methods are currently being considered:

1. Truck and shovel operation with ex-pit primary crusher and overland conveyor. This option involves drill and blast operations to mobilise ore that would be loaded by front end loader to 90 tonne haul trucks for delivery to an ex-pit primary crusher. The crushed material would then be fed onto an overland conveyor for transport to the processing plant. This option would require an ore stockpile at the junction of the conveyors.
2. In-pit crusher with gravity fed ore passes and underground conveyor decline (Figure 1). Front end loaders would transport blasted ore to a mobile in-pit crusher for delivery to twin inclined ore passes. The ore would be gravity fed down a 1 km long adit extending from near the process plant site to beneath the open pit design. The crushed material would be captured in twin apron feeders that progressively feed the ore to a trunk conveyor up the decline to the processing plant. The majority of the ore would be stored in the ore passes and there would be a small stockpile at the process plant site.

These mining process methods are being investigated further in the pre-feasibility phase of the project.

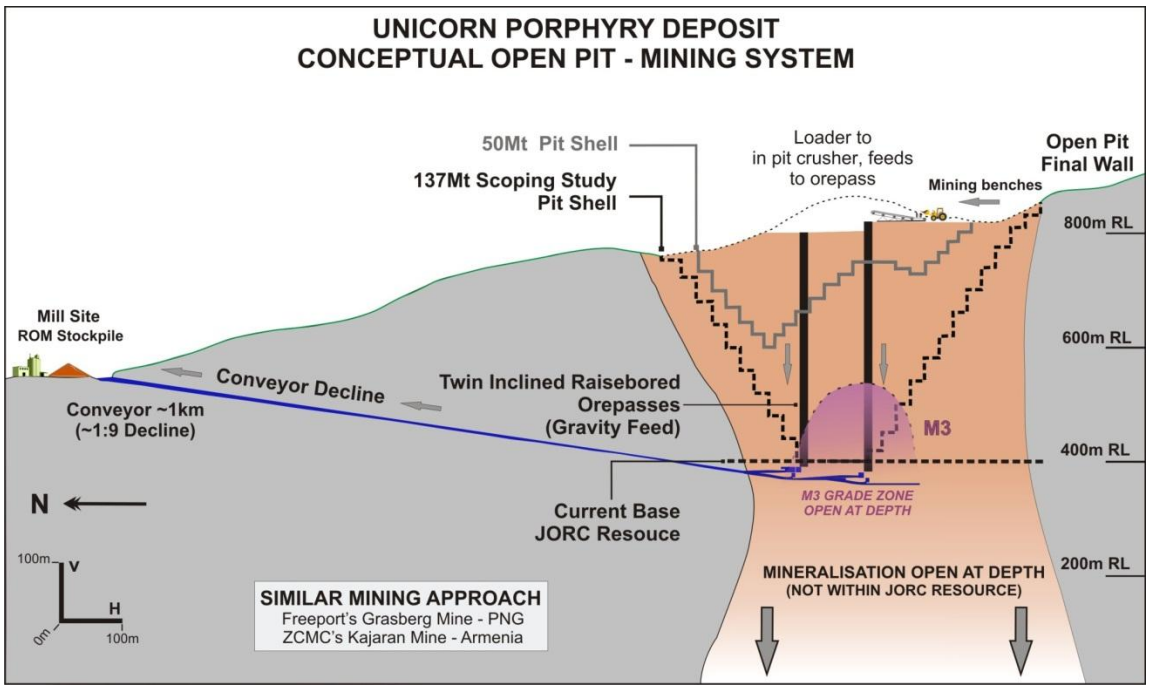

Figure 1 Conceptual mining system – ore passes and underground conveyor decline

2.4.2 Ore processing

Ore would be transported to the preferred process plant site via either an overland conveyor or underground conveyer decline. Processing would use a conventional semi-autogenous grinding technique, ball and pebble crushing comminution circuit, flotation, filtration concentrate storage, load-out and associated site infrastructure requirements. Separate molybdenum and copper/silver concentrates would be produced for sale.

2.4.3 Waste rock

The regional geology generally comprises steeply dipping Ordovician sandstone with outcropping igneous intrusions. The ore body of the Unicorn Project is one such igneous intrusion. Waste rock material produced from the open cut would be comprised of low grade porphyry, altered sandstone and breccia and is expected to be non-acid forming. The quantity of waste rock is estimated to be approximately 30 million tonnes. Crushed waste rock material is expected to be incorporated into the TSF embankment and Teapot Creek clean water dam embankment. As the TSF embankment is to be built in stages, waste rock would be temporarily stored in-pit or transported via haul truck for storage within the TSF boundary until such time as it can be used in the next stage of the TSF embankment construction.

2.4.4 Tailings Storage Facility

The life of mine (20 year) volumetric tailings storage requirement has been estimated to be approximately 200 million tonnes (Mt). The tailings material is expected to be non-acid forming and would be thickened to a solids concentration of between 55% and 60% on a weight by weight basis (w/w). Five valley storage options have been considered for the project and the preferred location is to the south west of the mine at Bull Paddock Creek. The TSF would be created by construction of a cross valley embankment. The TSF would be constructed and operated in accordance with Australian National Committee on Large Dams (ANCOLD) guidelines. The proposed embankment design allows for seepage collection in a dam constructed close to the downstream toe of the embankment. The seepage collection dam would include seepage return infrastructure that would return seepage to a decant pond.

The TSF embankment would be constructed in stages and would develop as mining progresses. Waste rock would be used in the construction of the embankment supplemented by materials sourced from within the TSF catchment and from a quarry site identified in close proximity to the TSF. The first stage of the dam wall has been designed to be thicker in width than subsequent raises. The first stage may be in direct contact with water but subsequent stages would have tailings with relatively low permeability in contact with the wall.

It is likely that filter materials for the TSF embankment would be imported to site (ATC Williams 2013). The permeability of the embankment will be reduced to a very low level using a clay core or high density polyethylene liner. Investigations within the TSF catchment would be undertaken to confirm the quality and quantity of suitable clay material for use in the embankment core.

Tailings would be thickened to recover water and reduce pumping requirements and then transported from the process plant via pipeline and discharged via spigots from the head of the valley. This pipeline easement would be approximately 10 metres wide and would be approximately 4km in length. Water would collect at the southern end of the TSF catchment where it would be pumped via a return water pipe line to the Teapot Creek clean water storage for reuse at the process plant. The proposed TSF would be designed without an emergency overflow dam due to the expected non-toxic nature of the tailings and management and access constraints (ATC Williams 2013).

The seepage and discharge volumes will be determined during detailed design, however a range of potential discharge rates from the dam into the seepage pond will be calculated as part of the water balance in the pre-feasibility stage.

2.4.5 Water Management

The Project would require approximately 15 GL/year in process water, of which it has been estimated that approximately 4 GL/year would be required in ‘make up’ water. Dart Mining is considering options to supply this 4 GL/year, including groundwater extraction and on-site surface water harvesting.

Preliminary assessment results indicate that the catchment of the preferred TSF location would result in a gross annual yield of between 3.298 GL and 6.45 GL depending on the tailings thickener concentration. During periods of above average rainfall it is possible that catchment runoff yield could be surplus to the requirements of the mine. Possible solutions include the construction of the proposed diversion drain and continuous overflow of the TSF spillway subject to water discharge quality requirements (ATC Williams 2013). The construction of a diversion drain would also assist in maintaining environmental flows within the Bull Paddock Creek catchment.

The process plant site would require a clean water storage dam and a process water storage dam An additional 155 ML clean water storage may be constructed on Teapot Creek. This clean water storage would receive flows from in pit dewatering and surface water runoff from the upper Teapot Creek catchment and surface water yield from the TSF catchment.

2.4.6 Power requirements

The total estimated average power requirement of the Project is 40 MW. An assessment of 12 power supply options has been conducted including an assessment of the extension and upgrade of the existing electricity supply network and in-situ renewable and non-renewable power generation alternatives (Refer Table 1). From this initial assessment two options will be further assessed during the pre-feasibility phase of the project. These options are:

- Option 3: Power line from Murray Switching Station to Dederang Terminal Station) (MSS-DDTS) (transmission line

- Option 4: Power line from Murray Substation

Table 1 Power supply options identified

Category	Option	Power supply option	Preliminary assessment	PFS assessment
Power line	1	Power line from local 22 kV grid	N	N
	2	Power line from Wodonga Terminal Station	N	N
	3	Power line from MSS-DDTS Transmission Line	Y	Y
	4	Power line from Murray Substation	Y	Y
In-situ generation	5	Diesel-fired power plant	N	N
	6	Gas-fired power plant, fuel via pipeline	Y	N
	7	Gas-fired power plant, fuel via CNG trucking scheme	Y	N
	8	Gas-fired power plant, fuel via LNG trucking scheme	Refer CNG	Refer CNG
Renewable energy	9	Solar-gas hybrid power plant	N	N
	10	Wind-gas hybrid power plant	N	N
	11	Biomass fired power plant	N	N
	12	Hydropower plant	N	N

Power line options

For Option 3 and Option 4 power would be purchased from the grid and delivered via newly constructed 132 kV overhead power lines to a substation located on a parcel of private land adjacent to Bunroy Road. Typical 132kV power lines are single pole power lines. Power would then be reticulated (22 kV) to the process plant site and to other items of infrastructure around the site.

Option 3 would require the construction of a new substation east of Corryong to obtain power from the MSS-DDTS transmission line and the construction of a dedicated 132 kV power line to the project site.

Option 4 would require the construction of new switch bay at the Murray Switching Station located at Khancoban in NSW and the construction of a 132 kV dedicated power line to the project site.

Power line route options have been assessed with consideration given to access for construction, planning overlays, proximity to existing private and public assets, topography, flooding and fire risk. The preferred power line alignment corridor is presented in Appendix B. The power line route is yet to be confirmed. The preferred route would follow existing easements, roads and access tracks where possible and would be developed in consultation with agency and community stakeholders. There is potential for native vegetation to be removed in the vicinity of the poles during construction and to maintain a safe easement. The power line corridor is expected have a width of 45 metres.

2.4.7 Transport routes and access

Access to the mine site would be via the existing local road network from Corryong. The transport route from Corryong would be via the Murray Valley Highway, Upper Murray Road and Bunroy Road. Sections of the Bunroy Road are unsealed and would require upgrading.

Access to the mine would be via the Teapot Creek Track off Bunroy Road. A series of tracks exist in the State Forest that would require an upgrade and in some cases re-routing for the purposes of the project. In some areas new access tracks may be required depending on the terrain.

Bagged concentrate material would be trucked from the site to the Ettamogah intermodal rail hub immediately north of Albury-Wodonga, where it would be loaded into containers and transported by rail to the Port of Melbourne. No augmentation of the intermodal hub would be required. The transport route (approximately 172 km) is anticipated to utilise Bunroy Road, the Upper Murray Road, the Murray Valley Highway, Bandiana Link Road and the Hume Highway.

2.4.8 Mine rehabilitation and closure

The TSF, mine and processing plant areas would be rehabilitated. At closure, the open pit would be reshaped and rehabilitated to form a stable final landform and possibly a permanent water storage. It is considered likely that the downstream TSF embankment slope would be reshaped (flattened) to a slope that matches the surrounding terrain and provides long term stability. Mine infrastructure would be decommissioned and removed from site at closure. Areas would be rehabilitated and where appropriate reshaped and covered with soils that will support native vegetation. To facilitate this requirement top soil and other extremely weathered material would be excavated as part of embankment foundation preparation and be possibly stockpiled for future reuse.

The rehabilitation and closure activities for the project would be detailed in the work plan and agreed with Department of Environment and Primary Industries (DEPI).

2.5 Project alternatives and options

Dart Mining has considered a range of alternatives for each element of the project – mining method, TSF design and location, ore processing facility location, power supply and water supply. The alternatives considered for each project element and the issues identified are outlined in Table 3 through Table 7.

The options considered for the location of the TSF and process plant are also illustrated in Appendix C.

2.5.1 Criteria

The criteria considered in the assessment of project alternatives varied depending on the element being assessed. The criteria adopted covered a range of environmental, economic, social and health and safety aspects as outlined in Table 2. The assessment of project alternatives also considered the level of uncertainty associated with impacts and the feasibility of options to manage any impacts.

Table 2 Assessment criteria

Environmental	Economic / Business	Social	Health and Safety
Area disturbed Proximity to mine	Area disturbed Proximity to mine Resource	Amenity – noise, vibration and air quality	Risks to workforce and surrounding community

Environmental	Economic / Business	Social	Health and Safety
Land use Flora and fauna Flooding and drainage Approvals and licencing Cultural and historical heritage	development and operational requirements Security of supply Approvals and licencing Capital expenditure Operating expenditure Energy use Location of ore body.	Visual amenity Traffic Groundwater users Land use Public safety Workforce employment	

2.5.2 Mining method options

The following key objectives were prioritised during the selection of the preferred mining option:

- Economically viable;
- Smallest construction footprint (minimise impact to native vegetation and habitat); and
- Low operating costs.

Table 3 Mining method options

Project element	Alternatives	Considerations	Assessment
Mining methods	In-pit primary crusher & ore passes to underground conveyor	May be less economically viable during start up Smallest disturbance footprint Reduced operating costs and workforce requirements Less flexibility to adapt to production rate changes	To be further assessed.
	Truck haul to ex-pit primary crusher & surface conveyor	May be more economically viable during start up Increased disturbance footprint Highest operating cost and workforce requirements Flexibility to adapt to production rate changes	To be further assessed.
	In-pit primary crusher & surface conveyor	Consistent operating costs of life of mine Limited workforce required Increased disturbance footprint Resource development constraints	Not to be further assessed.

2.5.3 Tailings Storage Facility options

The following key objectives were prioritised during the selection of the design and location of the preferred TSF:

- Efficient storage;
- Proximity to mine
- Low amenity impacts; and
- Size of catchment.

Table 4 TSF design and location options

Alternatives	Considerations	Assessment
TSF design		
Paddock cells	Inefficient earth-fill quantities On- site source materials limited Limited suitable terrain available in proximity to mine Large area required	Not to be further assessed.
Stacked schemes	Proposed tailings characteristics are unsuitable	Not to be further assessed.
Valley storage	Efficient storage Suitable terrain available in proximity to mine Large area required	Preferred option.
TSF location		
Bunroy Creek	Close proximity to the Murray River Close to historic heritage areas (Bunroy Station) Efficient storage capacity Relocation of public road required Heavily vegetated	Not to be further assessed.
Bullocky Creek	Located in isolated valley High elevation - Significant pumping required Long pipe line route and materials haul route Inefficient storage capacity Heavily vegetated	Not to be further assessed.
Biggara Creek	Open farm land Amenity impacts Relocation of public road required Efficient storage capacity Large foundation excavation required Located downstream of plant site Large catchment with likely excess water	Not to be further assessed.
Upper and Lower Teapot Creek	Water interactions with processing site and/or mine and associated infrastrucre. Inefficient storage capacity	Not to be further assessed.
Bull Paddock Creek	Located in isolated valley Efficient storage capacity Down-valley discharge Relatively long pipeline route Rock-fill materials likely sourced internally Large catchment to provide significant contribution to mine water supply Heavily vegetated	Preferred option. To be further assessed.

2.5.4 Ore Processing Facility location options

The following key objectives were prioritised during the selection of the preferred ore processing facility location:

- Proximity to mine;
- Suitable terrain; and
- Ease of access

Table 5 Ore processing facility location options

Alternatives	Considerations	Assessment
Site 'A'	Close proximity to mine Ore transport via conveyor Terrain and earthworks requirements Access requirements State Forest	Preferred option
Site 'B'	Reasonable proximity to mine Ore transport via truck Terrain and earthworks requirements Access requirements State Forest	Not to be further assessed.
Site 'C'	Further from mine Ore transport via truck Terrain and earthworks requirements Access requirements Open farmland	Not to be further assessed.
Site 'D'	Further from mine Ore transport via truck Terrain and earthworks requirements Access requirements State Forest	Not to be further assessed.
Site 'E'	Further from mine Ore transport via truck Terrain and earthworks requirements Access requirements State Forest	Not to be further assessed.
Site 'F'	Further from mine Ore transport via truck Terrain and earthworks requirements Access requirements State Forest	Not to be further assessed.
Site 'G'	Reasonable proximity to the mine Reduced energy consumption for pumped transfer of water and tailings due to increased altitude Ore transport via conveyor Terrain and earthworks requirements Access requirements State Forest	To be further assessed

2.5.5 Power supply options

The following key objectives were prioritised during the selection of the preferred power supply options:

- Economically viable; and
- Adequate generation capacity.

Table 6 Power supply options

Alternatives	Considerations	Assessment
Option 3: Power line from new substation east of Corryong.	Connection and approval requirements Line fault interruptions Route alignments Power supply costs	To be further assessed.
Option 4: Power line from Murray Switching Station	Traverses a State boundary and transmission business boundary. Connection and approval considerations Line fault interruptions Route alignments Power supply costs	To be further assessed.
Option 7 & 8: Gas-fired power plant & fuel via CNG/ LNG trucking scheme	Flexibility Noise and emissions Traffic volumes Interconnect supply capacity constraints	Not to be further assessed.
Option 6: Gas-fired power plant & fuel via pipe line	150 km pipe line required Significant capital cost	Not to be further assessed.
Renewables: Solar/ gas, wind/ gas, biomass, hydro-electric	Generation capacity from biomass, wind and solar resources is limited and will not match project power requirements. Rate of return over mine life	Not to be further assessed.

2.5.6 Water supply options

The following key objectives were prioritised during the selection of preferred water supply options:

- Good quality water;
- Proximity to mine;
- Few groundwater users; and
- Security of supply.

Table 7 Water supply options

Alternatives	Considerations	Assessment
Biggara Valley - groundwater	Good water quality Potentially high yielding basement Close proximity to mine Fewer groundwater users Overlying sediments may be a constraint	To be further assessed.
Thowgla Valley - groundwater	Good water quality Potentially high yielding sediments Fewer groundwater users	Not to be further assessed.

Alternatives	Considerations	Assessment
	Potentially low yielding basement Significant pipe line and pumping requirements	
Corryong Plains - groundwater	Good water quality Long distance from mine Potential flood risk High density of groundwater users	Not to be further assessed.
Unicorn Mine - groundwater	Good water quality Close proximity to mine Limited groundwater users Potentially low sustainability of supply	Preferred option. To be further assessed.
Bull Paddock TSF – surface water	Good water quality Security of supply uncertain Currently proposed infrastructure can be utilised	Preferred option. To be further assessed.
Pumped directly from the Murray River	Good water quality Reliability of supply Long distance from mine. Pipeline easement Environmental impacts of pipeline and off take. Operating costs	Unlikely. No further assessment at this stage.

2.6 Project program and timing

2.6.1 Project implementation

The Unicorn Project is currently approaching the end of Phase 1 of the pre-feasibility study (PFS). The outcome of Phase 1 is the preliminary assessment of various options for mining, processing, power supply, water supply and tailings management (Refer to section 2.5). Phase 2 of the pre-feasibility study will include further assessment of viable options from Phase 1 the outcome of which would be the final project definition. An indicative project timeline, per quarter, is provided in Table 8.

Table 8 Indicative project timeline

	2013		2014				2015				2016				2017
Stage	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1
Phase 2 PFS															
EES and other primary approvals															
Feasibility Study															
Pre-construction / Construction															
Operation															

2.6.2 Pre-construction activities

Pre-construction activities are likely to commence in 2015 and may include:

- Vegetation clearing to establish:
  - Site access
  - Process plant site to be used as a laydown area and for materials storage during the construction phase
  - Construction of Teapot Creek Dam
- Public road upgrades
- Earthworks associated with the installation of:
  - Site access road upgrades
  - Onsite water storage and drainage management structures

2.6.3 Construction activities

Construction is expected to commence in 2015. The likely core construction activities are outlined below.

- Vegetation clearing, topsoil stripping and stockpiling
- Construction of mine infrastructure including:
  - Ore storage area
  - Process plant infrastructure
  - Power supply and distribution
  - Transport facilities, bulk handling and truck loading facilities
  - Stage 1 of TSF
  - Pit development
  - Development of ore passes and decline (if required)
  - Conveyor route and ore storage area (if required)
  - Pipelines for the transport of tailings and return water
  - Haul roads
  - Clean water storage dam and associated water supply infrastructure
  - Site offices, workshop and amenities
- Construction of ancillary infrastructure such as administration buildings and workshop
- Drilling and boring for the construction of ore passes and decline (if required)
- Quarrying to source construction materials

2.6.4 Operational activities

The Unicorn Project has an estimated total life of approximately 20 years. The project's operational activities are likely to include:

- Drill and blast operations
- Haul truck operations
- Crushing
- Ore processing and product production
- Waste rock storage

- Fuel and chemical storage
- Tailings management
- Water management
- Transport of concentrate
- Maintenance of site office, workshop, explosives storage buildings
- Employee and contractor transport

2.6.5 Decommissioning activities

Decommissioning activities would be progressively undertaken during the life of the project (e.g. closure and revegetation of disturbed areas which are no longer active) and at the end of mining and processing activities, and would be likely to include:

- Clean and make good all hazardous storage structures;
- Sealing and rehabilitation of mine portals, ore passes and ventilation shafts (if constructed) and access roads;
- Contouring, topsoiling and revegetating any waste rock storage areas not rehabilitated during the life of the operation;
- Shaping of surface of mine pit to stable and final profile
- Removing all infrastructure including process plant, workshops and offices, plus their footings and rehabilitating the site(s);
- Using closure processes agreed with government, implementing TSF closure activities, decommissioning ancillary infrastructure, rehabilitation of access tracks and any bore fields and continue the environmental monitoring programmes setup during the construction of these facilities for the agreed period following cessation of activities, and
- Ongoing revegetation and rehabilitation monitoring.

3. Existing Environment

This section draws on the following sources of information in order to describe the existing environment in the project investigation area:

- URS 2013, Report – Unicorn Project Water Supply Options Assessment, 2 July 2013.
- Biosis 2013, Report– Unicorn Project Preliminary Flora and Fauna Assessment, 1 August 2013.
- GHD 2013a, Report – Project Unicorn Cultural Heritage Desktop Assessment, August 2013.
- GHD 2013b, Report – Project Unicorn Planning Assessment, July 2013.

The project investigation areas were established based on the location of the ore body, and following an analysis of options associated with the mining method, ore processing site, tailings storage facility site and power supply (refer sections 2.4 and 2.5). The investigation areas cover the broad geographical locations where project activities may be undertaken. In some cases these were delineated by features such as catchment boundaries, existing roads or power line alignments.

3.1 Climate

The region has an average long term average yearly rainfall ranges from 820 – 1050 mm/year, although during the recent drought rainfall ranged from 640 – 860 mm/year. There is significant inter-year variation in rainfall (URS 2013).

3.2 Topography and landforms

The project is located in the high relief hills of the Great Dividing Range. The currently preferred ore processing facility site is at an elevation of approximately 540 m AHD. The open pit lies above this at up to approximately 890 m AHD. Within 20 km of the mine site, elevation ranges from approximately 250 m AHD on the alluvial plains to the north, to approximately 1500 m AHD to the south (URS 2013).

There are four main landform types in the project area (URS 2013):

- High relief montane in the upland hills, characterised by north trending branching ridges;
- Moderate relief hill tracts in more weathered zones;
- Low relief foothills and intermontane basins in the highly weathered basement hills and colluvial aprons; and
- Alluvial valleys, ranging from narrow to broad terraced valleys, including the Corryong, Thowgla and Biggara creek valleys.

3.3 Soils and geology

The project lies within the Omeo Structural Zone of the Lachlan Fold Belt and is split into the High Plains and Corryong Subzones. The project falls within the Corryong Subzone (URS 2013).

The project investigation area and surrounding region comprises the following:

- Pinnack Sandstone: The Early to Middle Ordovician Pinnak Sandstone forms the bedrock unit in the area. It consists predominantly of turbidic sandstone, interbedded with mudstone and minor siltstone.

- Granitoids: Several granitic bodies intruded the Pinnak Sandstone during major tectonic events from the Early Silurian to Early Devonian. These include the I-type granitoid to the south of the project and S-type granites to the north and west. There are also three small leucogranites and quartz-feldspar porphyrys, of which the Mount Unicorn porphyry is one.
- Omeo Metamorphic complex: The Pinnak Sandstone has been regionally metamorphosed to schist and hornfels to the north and south east of the project site.
- Alluvium: Two main types of alluvium exist in the currently action channels and floodplains and on older alluvial terraces. The age of these sediments is constrained to the late Cainozoic for the older terraces to Recent for the active channels and floodplains. The older terraces consist of variably cemented, very crudely stratified, rounded gravels m up to 15 cm. The gravels are closely packed and cemented by very coarse grained sand and minor clay. Road cuttings suggest that these terraces are 3 – 5 m above the active floodplain, and are buried by colluvium in most places. The alluvium in active channels and floodplains is believed to be similar to that in the older terraces, but not cemented.
- Colluvium: Significant colluvium aprons exist on the slopes of some Ordovician and Granite hills, including in the Corryong, Thowgla and Biggara Valleys. These deposits include hillwash, gully alluvium, scree and poorly sorted rubble and range from poorly consolidated to partially cemented. The colluvium in the project area is mapped as unnamed Quaternary deposits.

Site specific geotechnical and soil information will be obtained as the Project progresses.

An initial review of the Australian Soil Resources Information System (ASRIS) indicates that acid sulphate soils have a low to extremely low probability of occurrence in the project area.

3.4 Land use and planning

3.4.1 Planning Scheme

Victoria

The Towong Planning Scheme applies to the Victorian component of the works. Under clause 74 of the Towong Planning Scheme the project is defined as:

Earth and energy resources industry, which includes:

- *'Land used for the exploration, removal or processing of natural earth or energy resources. It includes any activity incidental to this purpose including the construction and use of temporary accommodation'.*

The power line route within NSW is located within the Tumbarumba local government area.

NSW

Under the *Tumbarumba Local Environmental Plan 2010*, the power line would be defined as a 'public utility undertaking':

> ***public utility undertaking*** *means any of the following undertakings carried on or permitted to be carried on by or by authority of any Government Department or under the authority of or in pursuance of any Commonwealth or State Act:*
>
> *(a) railway, road transport, water transport, air transport, wharf or river undertakings,*
>
> *(b) undertakings for the supply of water, hydraulic power, electricity or gas or the provision of sewerage or drainage services,*

and a reference to a person carrying on a public utility undertaking includes a reference to a council, electricity supply authority, Government Department, corporation, firm or authority carrying on the undertaking.

State planning policy

Victoria

The following clauses of the State Planning Policy Framework are considered relevant to the project:

- Clause 12.01 – Biodiversity
- Clause 13.04 – Noise and Air
- Clause 13.05 – Bushfire
- Clause 14.02 – Water
- Clause 14.03 – Resource Exploration and extraction
- Clause 15.03 – Heritage
- Clause 17.02 – Industry
- Clause 19.03 – Development Infrastructure

NSW

The *State Environmental Planning Policy (Infrastructure) 2007* (Infrastructure SEPP) is relevant to the project. The aim of the Infrastructure SEPP is to facilitate the effective delivery of infrastructure across the State by, among other things, improving regulatory certainty and efficiency through application of a consistent planning regime for infrastructure and the provision of services. Under the Infrastructure SEPP the power line would be permissible without the need for development consent given that work to install the power line would be carried out on behalf of an electricity supply authority.

Local planning policy

Victoria

The Local Planning Policy Framework consists of Councils municipal strategic statement and local planning policies.

Key sections of Council's Municipal Strategic Statement include:

- Clause 21.06 Environment
- Clause 21.09 Reference Documents

Relevant local planning policies are identified below:

- Clause 22.04 Steep Land
- Clause 22.08 Effluent Disposal and Water Quality

Zone and overlays

Victoria

The following zones are relevant to the investigation area.

- Public Conservation and Resource Zone (PCRZ)
- Farming Zone (FZ)

- Rural Activity Zone (RAZ)

The following planning overlays are considered relevant to the project:

- Wildfire Management Overlay (WMO)
- Land Subject to Inundation Overlay (LSIO)
- Environmental Significance Overlay Schedule 1 (ESO1) 'High Quality Agricultural Land'

Zones and Overlays are presented within Appendix D.

NSW

The indicative power line alignment predominantly travels through the RU1 Primary Production zone under the LEP. The route is also potentially affected by the RU5 Village and RE2 Private Recreation zones.

Public utility undertakings are permissible with development consent in the RU1 and RU5 zones, however are prohibited in the RE2 zone.

Particular provisions

Victoria

The following particular provisions are considered relevant:

Clause 52.08 – Earth Resource Exploration and Development

Clause 52.08 *'Earth and Energy Resources Industry' states that 'no permit is required to use or develop land for earth and energy resources industry if the following conditions are met':*

- Mineral extraction:
  - Complies with Section 42(7) or Section 42A *Mineral Resources (Sustainable Development) Act 1990*; or
  - Complies with Section 47A of the *Electricity Industry Act 1993*.

It is understood the project would be developed under the *Mineral Resources (Sustainable Development) Act 1990* (MRSD Act) and therefore the project is exempt from planning approval.

Clause 52.17 – Native Vegetation

This clause is relevant as much of the project investigation area is Crown Land – State Forest and contains significant native vegetation.

An exemption exists under Clause 52.17-6 which stating that *'No permit is required to remove, destroy or lop native vegetation to the minimum extent necessary if any of the following apply'*…

Mineral extraction: *'to enable the carry out of Mineral extraction in accordance with a work plan approved under the Mineral Resources (Sustainable Development) Act 1990 and authorised by a work authority granted under that Act'*.

If approval is obtained under the MRSD Act, no permit is required for native vegetation removal.

3.4.2 Land Tenure and other interests

Land Tenure

The majority of mine and TSF investigation area is Crown Land. Several small land parcels in the northern end of the proposed mine investigation area are currently in private ownership and are subject to the Rural Activity Zone.

Grazing licences are issued for two Crown Land parcels adjacent to the proposed mine and tailings dam investigation areas.

The majority of the indicative power line alignment is on private land.

Refer to Appendix E for an understanding of Crown Land and private land ownership within the project investigation area.

Forest Management Plan

A Regional Forest Agreement (RFA) was developed for North-East Victoria between the Federal and Victorian Governments in 1999.

Two key land classifications affect the project area (refer Appendix F), namely:

- State Forest – Special Protection Zone (SPZ); and
- State Forest – General Management Zone (GMZ).

Native Title

A search of the National Native Title Tribunal Showed that there were no Native Title Claimants or Determinations for the proposed investigation area, either in Victoria or NSW. As such there are also no Indigenous Land Use Agreements.

The nearest Native Title Determinations are more than 100 km away.

Victorian Environmental Assessment Council

A review of the Victorian Environmental Assessment Council (VEAC) website indicates that there are no current investigations applicable to the project area or power line investigation area (Victorian component).

3.5 Water environments

3.5.1 Surface water environments

The project investigation area is located within the headwaters of the Murray River, or the "Upper Murray" (Victorian River Basin 01) catchment, within the Murray Darling Basin. The main sub-catchments feeding the Murray River in this area are the Nariel Creek/Corryong Creek, Thowgla Creek and Biggara Creek systems.

The project investigation area is part of Management Unit 24 (NECMA 2006). Relevant Index of Stream Condition (ISC) reaches are the Thowgla Creek reaches 22 and 23, downstream of the investigation area.

The catchments in the vicinity of the project area / mine site are typically vegetated with native forest and are associated with relatively steep slopes with narrow valley floors. The main waterways within and downstream of the investigation area are not seasonal or intermittent, although some of the smaller tributaries withn the area will be ephemeral.

The project area straddles two main sub-catchments; Teapot Creek and Bull Paddock Creek. The mine site and ore processing facility would be located within the Teapot Creek catchment. Teapot Creek flows in a north easterly direction where it combines with a number of other waterways to form the Biggara Creek.

The preferred location for the TSF is to the south west of the mine site in the Bull Paddock Creek catchment. Bull Paddock Creek is formed by the confluence of the Jarvis, Hayes and Dinner Creeks and flows in a westerly direction until it meets Bullocky Creek and Reach 23 of Thowgla Creek.

Water Flows

There is currently no surface water flow gauging in the vicinity of the project. Dart Mining is in the process of installing three flow gauging stations on Teapot Creek and Bull Paddock Creek (at the site of the proposed TSF and at a downstream location).

By extrapolating instantaneous flow gauging data obtained from the nearby Upper Nariel Creek gauging station, URS (2013) has estimated that the median streamflow of Bull Paddock Creek at the proposed location of the TSF to be in the order of 9.5 GL/year.

Water Quality

No water quality data associated with project area appears to have been collected or be publicly available. Dart Mining has commenced a surface water quality monitoring program which involves sample collection from both the Teapot Creek and Thowgla Creek catchments in order to assist with the characterisation of water quality in these catchments. A detailed water quality monitoring plan will be established using the ANZECC 2000 guidelines.

Index of Stream Condition (ISC)

Assessments of stream condition were undertaken for the Thowgla Creek (both Reaches 23 and 24) in 2004. The upper reach of Thowgla Creek (Reach 23) including the area extending 6 km below its confluence with Bullocky Creek was classified by the ISC as being in 'good' condition based on a single sample site. The 'good' condition was associated with the absence of barriers to fish passage, limited erosion, the quality and extent of riparian vegetation present and the hydrological characteristics.

No sampling of water quality or aquatic life was undertaken as part of the 2004 assessment.

No equivalent information is available on the stream condition of the Biggara Creek.

Groundwater Dependent Ecosystems

A significant part of the project area has been mapped as potential groundwater dependant ecosystems (GDEs) in the GDE Atlas (Bureau of Meteorology). This mapping includes ecosystems that rely on the surface expression of groundwater discharge and ecosystems that rely on subsurface groundwater (URS 2013). Site specific assessment would be required to identify and delineate these areas at the project scale level.

3.5.2 Groundwater environments

The project investigation area is located within the Unincorporated Area - Goulburn-Murray Water groundwater management unit. There is no Groundwater Supply Protection Area (GWSPA) or Management Plan in place. Therefore there are no specific groundwater management protocols or conditions on groundwater use. Environmental water requirements for groundwater dependant ecosystems have not been developed.

The regional hydrogeology includes three hydrostratigraphic units: Sediments, Intrusives and Ordovician Basement (URS 2013). A preliminary assessment of groundwater in the region found that:

- Springs are common in the Upper Murray catchment;
- Groundwater discharge occurs on the alluvial plains of the Corryong and Thowgla valleys;
- Groundwater discharge is fresh (<400 µS/cm);
- Most springs remained wet during drought, or only dried up briefly;
- Alluvial sediments include layers of clay and gravel; and

- Gravel layers contain ‘good drinking water’.

There are no groundwater bores associated with the State Observation Bore Network in the vicinity of the project area. Private bores are generally associated with stock and domestic use and are located in the lower and flatter valley areas which have been developed for agriculture.

URS (2013) developed a series of conceptual models associated with a number of potential groundwater supply options for the project. These models are based on the available groundwater and registered bore information in the region.

At the project scale, it is envisaged that a network of bores will be installed in order to assist with the identification of potential groundwater supplies for the project and to monitor groundwater levels and quality over the longer term.

3.6 Cultural heritage

A desktop cultural heritage assessment has been undertaken by GHD in July 2013. Section 3.6 outlines the findings of this report.

3.6.1 Aboriginal

A search of the Victorian Aboriginal Heritage Register determined that the activity area is located within registered areas of cultural heritage sensitivity as shown on the Cultural Heritage Sensitivity and Registered Aboriginal Places Plan in Appendix G. The search revealed there were no Aboriginal cultural heritage places within the project area or indicative power line alignment. A basic search of the NSW Aboriginal Heritage Information Management System (AHIMS) database showed no sites as being previously recorded for the activity area.

Three previously recorded Aboriginal cultural heritage places are registered within a 20 km radius of the activity area centre point. The places are low density surface artefacts scatters. One place 8425-0001 is registered as a literature reference to a quarry site. One place 8425-006 is registered as a museum collection of lithic and wood artefacts including a breast plate. The third place 0525-0002 is a low density artefact scatter within the context of a vehicle/fire track. These are also shown on the Cultural Heritage Sensitivity and Registered Aboriginal Places Plan in Appendix G.

There are no appointed Registered Aboriginal Parties (RAPs) or registered RAP Applicants for the area, but there are three interested Aboriginal parties identified by AAV Hume Region: Duduroa Local Custodians, Dhudhuroa Waywurru, and Yaithmatang.

3.6.2 Historic

Local Planning Schemes

A search was undertaken of local heritage planning scheme overlays. In Victoria, no planning scheme overlays exist for the proposed activity area in relation to historic heritage. In relation to the NSW component of the works, there were four places of historic local significance identified within the local planning scheme overlays for Tumbarumba Shire Council within 20 km of the activity area. These are shown in the Victorian Heritage Inventory Sites and NSW Overlay Sites Plan in Appendix G. One site I17 (is within close proximity to the indicative power line alignment.

State Heritage Registers

A search of both the Victorian Heritage Register and Heritage Inventory was conducted. No Heritage Register sites were observed within the activity area. One Heritage Inventory (VHI) sites is located within the indicative power line alignment (see Appendix G).

- Heritage Inventory Site (Hermes 12200) (VHI No H8325-0007) – Conness Reef Mine Site (lat/long: 36.1945/148.0183); and

another is located in the vicinity of the Tailings Storage Facility Investigation Area:

- Heritage Inventory Site (Hermes 11077) (VHI No H8425-0001) – Thowgla Creek Alluvial Workings (lat/long: 36.3561/147.9325); and

a third VHI is located outside the activity area, west of Fishers Track:

- Heritage Inventory Site (Hermes 13997) (VHI No H8425-0003) - Mt Elliot Goldfield Corryong (lat/long: 36.1798/147.9659).

A search of the NSW Heritage Inventory and Register identified no previously recorded sites considered of State significance value. The nearest being relics and movable objects associated with Old Adaminaby and Lake Eucumbene (SHR 01794); some 50 kms to the north east of Khancoban.

Commonwealth Heritage Database

A search of Australian Heritage Database (incorporating the Register of the National Estate and the National Heritage List) and the Commonwealth Heritage List showed no previously recorded heritage values, either Aboriginal or historic, of national heritage significance located within the proposed activity area. The nearest values are:

- Australian Alps National Parks and Reserves (National), the nearest being approximately 2 kms to the south);
- Mount Strombo Observatory Precint (Commonwealth) in the ACT.

A search indicated that a Nationally Heritage Listed Place (Australian Alps National Parks and Reserves – Kosciuszko National Park is adjacent to the study area but it does not appear to overlap.

The PMST identified no National Heritage Places within the activity area. The nearest identified places are:

- Natural - Australian Alps National Parks and Reserves (Listed Place, NSW); and
- Historic – Snowy Mountains Scheme (Nominated Places, NSW)

3.7 Flora and fauna

A preliminary flora and fauna assessment has been undertaken (Biosis 2013). An assessment method was developed to focus on the detection of Spot-tailed Quoll and Smoky Mouse, as well as potential habitat for Austral Toad-flax, which were all predicted to occur within the investigation area by the Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC) Protected Matters Search Tool (PMST). During the course of targeted survey, general survey of species, habitats and vegetation types were undertaken in the project area. A desktop level assessment was undertaken for the indicative power line alignment. Field surveys were conducted between 3 and 7 June 2013.

3.7.1 Vegetation communities and habitats

Nine Ecological Vegetation Classes (EVCs) are present within the project area and indicative power line alignment

- Riparian Forest (EVC 18)
- Heathy Dry Forest (EVC 20)
- Shrubby Dry Forest (EVC (21)

- Grassy Dry Forest (EVC 22)
- Herb-rich Foothill Forest (EVC 23)
- Damp Forest (EVC 29)
- Valley Grassy Forest (EVC 47)
- Floodplain Riparian Woodland (EVC 56)
- Riparian Forest/Swampy Riparian Woodland/Riparian Shrubland/Riverine Escarpment Scrub Mosaic

The majority of EVCS within the Tailings Storage Facility footprint are Shrubby Dry Forest, Herb-rich Foothill Forest and Damp Forest, all of which are common and widespread in the local area and have a bioregional conservation status of 'Least Concern' in the Highlands – Northern Fall Bioregion.

There are smaller areas of Swampy Riparian Woodland near the proposed wall of the TSF. This EVC is part of a mosaic grouping of riparian and riverine EVCs which could not be mapped separately at the scale of this investigation. Swampy Riparian Woodland has a bioregional conservation status of 'Least Concern' in the Highlands – Northern Fall Bioregion. Dart Mining will aim to minimise impact on native vegetation.

3.7.2 Threatened species and communities

The preliminary flora and fauna assessment identified that there is potential habitat for the EPBC-listed Austral Toad-flax, Purple Eyebright, Growling Grass Frog and Koala (listed in NSW only). Further assessment and targeted survey will be undertaken to resolve the presence of these species. Even if present, it is likely that impacts to the Austral Toad-flax, Growling Grass Frog and Koala can be avoided.

The following FFG Act species have been recorded or have a medium or high likelihood of occurring within the Project area and/or indicative power line alignment:

- Austral Toad-flax
- Purple Eyebright (*Euphrasia collina subsp. muelleri)*
- Growling Grass Frog
- Common Bent-wing Bat
- White-footed Dunnart
- Grey Goshawk
- Intermediate Egret
- Eastern Great Egret
- Lewin's Rail
- Hooded Robin
- Diamond Firetail
- Barking Owl
- Powerful Owl
- Macquarie Perch

A number of additional species listed as rare or threatened under a DSE Advisory List (DSE 2005; DSE 2013) have been recorded or have a medium or high likelihood of occurring in the Project area.

The investigation of fauna incorporated a preliminary aquatic assessment with the aim of determining the need for aquatic fauna surveys. Biosis (2013) determined that there is a low likelihood of occurrence of significant aquatic species in the project area, with the exception of Macquarie Perch, which is listed under the FFG Act and EPBC Act. The Macquarie Perch has a medium likelihood of occurrence within the Project area. The potential for occurrence of significant aquatic species in the Power line Investigation Area will require further assessment. Biosis (2013) have recommended a general aquatic survey (targeting both fish and invertebrates) to validate the absence of any listed aquatic species both within and downstream of the investigation area.

3.8 Social environment

The project is located within the Towong Shire Council local government area. A 15.2 km section of one power line option would be located within the Tumbarumba Shire Council local government area near the township of Khancoban. The closest major town to the mine is Corryong, located approximately 17 km north west of the mine. The communities of Corryong and Khancoban, and the rural areas of the Bunroy Valley, Biggara Valley and Thowgla Valley are considered to be key community stakeholders for the Project.

The Towong Shire has an estimated population of 6,276 and includes the major township of Corryong with a population of approximately 1,200 people. The economy of the Shire is based primarily around primary production, particularly agriculture and forestry

4. Potential environmental impacts

4.1 Preliminary environmental aspect and impacts screening

Preliminary evaluation of potential environmental aspects and impacts associated with the project has been undertaken using a screening approach.

The preliminary screening aimed to:

- Highlight those issues that would require particular focus for investigation during the assessment and approvals process.
- Assist in determining the level and scope of investigations that would be undertaken.

This screening exercise forms the basis for further and ongoing comprehensive risk assessment and management throughout project development and delivery, consistent with the International Standards ISO 31000, Risk Management and ISO14001, Environmental Management Systems.

4.2 Methodology

An issues workshop was conducted on 5 April 2013 at the offices of Dart Mining in Corryong. The purpose of the workshop was to facilitate the identification of the key environmental issues which are likely to:

- Be material to obtaining timely project approvals; and
- Require detailed investigation during the assessment and approval process.

The scope of the workshop included the identification of the key environmental aspects associated with the following five activities:

1. Mining
2. Process plant;
3. Water management;
4. Power supply; and
5. Tailings management.

The project phases considered included the pre-construction, construction, operation and closure phases.

An environmental impact matrix was developed to inform the identification of environmental aspects (Table 9).

Table 9 Environmental impact matrix

Environmental impact category	Mining	Process Plant	Power supply	Water Management	Tailings Management
Biodiversity & habitat	X	X	X	X	X
Surface water	X	X		X	X

Environmental impact category	Mining	Process Plant	Power supply	Water Management	Tailings Management
Groundwater	X			X	X
Soils	X	X			X
Solid waste and contamination	X	X			X
Cultural heritage	X	X	X	X	X
Land use	X	X	X	X	X
Visual and landscape	X	X	X		X
Air and dust	X	X			
Noise and vibration	X	X			
Social impacts	X	X	X	X	X
Public safety	X	X			X
Greenhouse gas emissions and energy use	X	X	X	X	X
Rehabilitation	X	X	X	X	X

Aspects were identified by activity and impact category. Each aspect and impact was assigned an investigation category based on the consequence and capacity for management (Table 10).

Consequence - Level of sensitivity of assets and values and the scale, persistence and severity of potential impact.

Capacity for management of impacts – The anticipated complexity and the level of uncertainty in the mitigation measures required.

Table 10 Investigation category matrix

Category	Consequence	Capacity for management
A	High – Potential for extensive long term, significant assets or values under threat OR High levels of interest among agency stakeholders and community.	Time dependent investigations required for design, feasibility or approvals. Complex and detailed management measures required. High levels of uncertainty.
B	Medium – Potential for moderate impacts, significant assets or values may be affected over an extended timeframe with some resultant changes OR May be of interest to agency stakeholders and community.	Standard management measures are available that can be adopted with some tailoring during design and the issues require investigation in the approvals process.
C	Low – Potential for short term and localised impact. Asset or values may be temporarily affected but recovery expected.	Standard management measures are available. Routinely managed in the design phase. Impacts are predictable and able to be managed in the design or through environmental management planning.

4.3 Results

The outcomes of the preliminary environmental aspects and impacts screening exercise based on the methodology described above are presented in Table 11.

Table 11 Environmental aspects screen

	Aspect	Assets and values to be protected	Project phase			Investigation category	Comments
			C	O	D		
1	***Biodiversity and habitat***						
1.1	Permanent removal of large areas of native vegetation. Decline in quality of retained adjacent vegetation	Native vegetation	X			A	The majority of native vegetation within the investigation area belongs to EVCs of 'least concern' in the bioregion. Some smaller areas of EVCs are 'endangered' in the bioregion. Dart Mining will aim to minimise the impact on native vegetation in accordance with the Net Gain Policy.
1.2	Removal of known/potential habitat for nationally and state significant flora species	Significant flora species	X			A	Two flora species listed under the EPBC Act and FFG Act have the potential to occur in the project investigation area. Further investigations will be undertaken to determine the presence of these species. A number of flora species listed on the DSE Advisory list occur or have the potential to occur in the project investigation area.
1.3	Removal of known/potential habitat for significant fauna species.	Significant fauna species	X			A	A number of significant fauna species have been recorded or have a medium or high likelihood of occurring within the Project investigation area. Further investigations will be undertaken to determine the presence of significant species and identify mitigation measures.
1.4	Degradation of aquatic habitats	Aquatic habitats	X	X	X	A	Aquatic environments is likely to be affected by direct removal of in-stream or riparian habitat, notable hydrological changes,

	Aspect	Assets and values to be protected	Project phase			Investigation category	Comments
			C	O	D		
							deterioration in water quality (including pollution events) and sedimentation. Biosis (2013) completed a preliminary aquatic habitat assessment. Aquatic habitat within the investigation area, while suitable for numerous native and non-native species, was not considered capable of supporting populations of listed threatened species. This would be verified by conducting an aquatic fauna assessment within and downstream of the investigation area.
1.5	Impact on native fauna during construction and operation.	Fauna	X	X		B	The preliminary flora and fauna assessment (Biosis 2013) has identified a number of native fauna species that have been recorded or have a medium or high likelihood of occurring within the Project area. An Environmental Management Plan (EMP) would be developed that sets out the measures to reduce impacts to native fauna species that may utilise the project area.
1.6	Weed invasion, pests and disease	Biodiversity and habitat, threatened species	X	X	X	B	An EMP would be developed to minimise the impacts from weed invasion, pests and disease during the construction and operation of the project.
1.7	Habitat fragmentation and impact to wildlife corridors from linear infrastructure and easements	Fauna movement, habitat quality	X	X		B	Further assessment will investigate the habitat fragmentation and the impact to wildlife corridors from linear infrastructure and easements.
2	***Surface water environments***						
2.1	Changes to hydrological patterns and surface flow regimes associated with the TSF and other on-site storages	Catchment values Water resources	X	X	X	A	A surface water, flooding and drainage study would be completed to assess the impacts on surface water flows due to the construction and operation of the project.

	Aspect	Assets and values to be protected	Project phase			Investigation category	Comments
			C	O	D		
2.2	Mine water discharges to surface water environments	Surface water quality Catchment values	X	X	X	B	A site water management plan, including bunded runoff management structures, sediment traps and water diversion installations, would be implemented throughout each project phase.
2.3	Uncontrolled release of contaminated water from the TSF	Surface water quality Catchment values	X	X	X	B	A Project water balance with pre-defined triggers for discharge would be developed. The TSF would be constructed and operated in accordance with Australian National Committee on Large Dams (ANCOLD) guidelines. The TSF would incorporate embankment and spillway design to accommodate a design flood event without downstream discharge. The design flood event would be determined in accordance with ANCOLD Guidelines on Selection of Acceptable Flood Capacity for Dams (ANCOLD, 2000) and related guidelines. Divert catchment during high rainfall periods.
2.4	Site water use including water harvesting from the TSF and abstraction from local surface water environments.	Catchment values	X	X	X	A	A surface water, flooding and drainage study would be completed to assess the impacts on surface water flows due to the construction and operation of the project.
3	***Groundwater environments***						
3.1	Groundwater abstraction	Groundwater availability Groundwater dependent ecosystems Groundwater and surface water quality	X	X		A	A groundwater investigation would be completed to assess the impacts on hydrology, groundwater quality, resources and groundwater dependent ecosystems.
3.2	Management of extracted groundwater	Surface water quality	X	X		B	Extracted groundwater would be stored in the Teapot Creek Dam for use in the process plant. A site water management plan would be implemented for each project phase that

	Aspect	Assets and values to be protected	Project phase			Investigation category	Comments
			C	O	D		
							outlines the management actions to be implemented to protect environmental values.
3.3	Seepage to groundwater from the TSF	Groundwater availability Groundwater dependent ecosystems Groundwater and surface water quality		X	X	B	The TSF would incorporate design features, such as impervious zones and clay layers, to acceptably minimise the risk of impacts to groundwater.
3.4	Changes to groundwater movement patterns	Groundwater availability Groundwater dependent ecosystems		X		B	A groundwater investigation and impacts assessment would be completed to assess the impacts on hydrology.
4	***Soils, geochemistry and waste***						
4.1	Soil erosion and degradation	Soil quality Land use	X	X		B	There is limited topsoil at the location of the deposit. Where practical, topsoil would be stripped and stockpiled for reuse. A site water management plan, including erosion and sediment controls would be implemented throughout each project phase.
4.2	Destruction of landforms resulting in erosion, changed drainage patterns etc.	Topography and landforms	X	X	X	B	Potential effects of construction and operation activities on soil system including erosion and the changed drainage patterns would be investigated further. A site water management plan, including erosion and sediment controls would be implemented throughout each project phase.
5	***Waste and contamination***						
5.1	Waste rock generation	Resource use Final landforms	X	X	X	A	A waste rock characterisation study is currently being undertaken. Waste rock would be used in the construction of the TSF embankment. A rehabilitation plan would be developed that would identify suitable uses and rehabilitation requirements for waste rock.

	Aspect	Assets and values to be protected	Project phase			Investigation category	Comments
			C	O	D		
5.3	Acid mine drainage and contamination potential	Catchment values Soils and geology	X	X	X	A	Current information indicates that the waste rock is non-acid forming. A further waste rock characterisation study is currently being undertaken. A waste rock management plan would be developed to identify measures to reduce impacts to environmental values from the handling, storage and use of waste rock. A rehabilitation plan would identify suitable uses and rehabilitation requirements for waste rock.
5	***Cultural heritage***						
5.1	Disturbance to Aboriginal sites of significance	Cultural heritage	X			B	A search of the Victorian Aboriginal Heritage Register and NSW Aboriginal Heritage Information Management System undertaken as part of the desktop cultural heritage assessment (GHD 2013a) did not identify any Aboriginal cultural heritage sites within the project area of cultural heritage investigation area. The project investigation area (Victorian component) is located within registered areas of cultural heritage sensitivity. A mandatory Cultural Heritage Management Plan would be prepared for the Project. A due diligence would be prepared for the NSW component of the power line alignment.
5.2	Disturbance to non-indigenous historic and cultural heritage sites	Cultural heritage	X			C	One Victorian Heritage Inventory site is located within the indicative power line alignment. A number of other heritage sites are located within the vicinity of the project area and indicative power line alignment. A search of the NSW Heritage Inventory and

	Aspect	Assets and values to be protected	Project phase			Investigation category	Comments
			C	O	D		
							Register identified no previously recorded sites considered of State significance value. Project design would aim to avoid any impacts to listed heritage sites.
6	***Land use***						
6.1	Impact to land uses (forestry and agriculture)	Existing land uses Future potential land uses	X	X	X	B	Land used for forestry activities would be displaced during the life of the mine. Given the extent of the native forest estate in this region, impact to this land use activity is not expected to be significant, subject to further discussions with DEPI. A small percentage of the investigation area is agricultural land, used predominately for grazing. Project design would seek to minimise any disruption to agricultural activity. A rehabilitation and closure plan would be developed to ensure the viability of future land uses.
7	***Amenity***						
7.1	Visual impact of the open cut mine, ore processing facility and other site infrastructure including power lines.	Landscape and visual amenity	X	X	X	B	The Unicorn deposit is located within a saddle and mostly faces in a south – east direction, away from the Biggara and Bunroy valleys. The location of the deposit largely shields it from public view. Where possible, existing power line alignments would be utilised.
7.2	Air and dust emissions	Air quality	X	X	X	C	Given the remote location of the Project and that the closest sensitive receptor (farmhouse) is approximately 4 kilometres from the mine site, dust and air quality impacts are not expected to be significant.
7.3	Noise and vibration	Acoustic amenity	X	X	X	C	As above, noise and vibration impacts are not expected to be significant.

	Aspect	Assets and values to be protected	Project phase			Investigation category	Comments
			C	O	D		
8	***Social environment***						
8.1	Employment and business opportunities	Community wellbeing	X	X	X	B	The project is expected to generate direct and indirect employment opportunities. Around 85 Full Time Equivalent (FTE) jobs would be created by the Project when operational and personnel would be sourced primarily from Corryong and the surrounding region.
8.2	Community facilities	Community wellbeing		X		C	The project is not expected to negatively impact on any community facilities
9	***Public safety & hazards***						
9.1	Bushfire risk due to mining operations	Public health Public assets - forest Farmland Residences	X	X	X	B	A bushfire management plan would be implemented for each project phase.
9.2	Hazardous materials	Public health Catchment values Ecological values		X		B	A hazardous substances management plan would be implemented for each project phase. The transport, handling and storage of hazardous materials would be in accordance with AS1940 and the requirements of the *Environment Protection Act 1970*.
9.3	TSF failure	Public health and safety Catchment values Ecological values Hydrogeological values		X	X	A	The TSF would be constructed and operated in accordance with ANCOLD guidelines. There are a number of risks associated with the construction and operation of the TSF and it will require detailed planning and review. These hazards however, are dealt with routinely on other mine development projects and comprehensive guidelines and standards exist.
9.4	Accidents and emergencies	Public safety Workforce safety	X	X	X	C	An emergency response management plan would be implemented for each project phase.

	Aspect	Assets and values to be protected	Project phase			Investigation category	Comments
			C	O	D		
9.5	Changed traffic or road conditions	Public safety	X	X	X	B	The project would utilise the existing road network from Corryong. The Bunroy Road would require an upgrade. A traffic impact assessment would be conducted to inform any road treatments that may be required.
10	***Greenhouse gas emissions***						
10.1	Greenhouse gas emission contribution from the project	Global climate	X	X	X	C	The project would contribute to greenhouse gas emissions generated predominately from vegetation removal, fuel use and electricity use. The GHG emissions associated with this project are not expected to be significant at a State level.
11	***Rehabilitation***						
11.1	Rehabilitation failure due to loss of critical soil and/or vegetation resources	Soils and geology Catchment values Ecological values		X	X	B	A rehabilitation and closure plan would be developed as part of the work plan and agreed with DEPI.
11.2	Rehabilitation failure due to modification to flow regimes and drainage patterns	Catchment values Ecological values Hydrogeological values		X	X	B	As above
11.3	Rehabilitation failure due to inappropriate final land forms	Future potential land uses Final landforms		X	X	B	As above.

5. Applicable approvals

The Project will require a range of approvals under Victorian and Commonwealth legislation.

There may also be additional consents or permits, triggered under New South Wales legislation, in the event that ancillary works are undertaken within New South Wales (for example, native vegetation removal to accommodate power lines).

A summary of the likely primary approvals required for the project are listed in Table 12.

Table 12 Statutory approvals likely to be triggered for the Project

Approval/Consent /Referral	Trigger	Agencies	Comments
Commonwealth			
Referral to the Minister under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)	The Action is likely to have a significant impact on any Matter of National Environmental Significance	Commonwealth Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC)	The Project would need to be referred under the EPBC Act given the extent of the project footprint and the potential presence of listed threatened species.
Victorian			
Referral to the Minister under the *Environment Effects Act 1978*	A project with potential adverse environmental effects that, individually or in combination, could be significant in a regional or State context should be referred. The Minister for Planning will determine whether an EES is required.	Department of Transport, Planning and Local Infrastructure (DTPLI)	The Project meets the Referral criteria specified within the Ministerial Guidelines.
Mining Licence under the *Mineral Resources (Sustainable Development) Act 1990* (MRSD Act).	Extraction of minerals from the land for commercial production, including processing and treating ore and other activities ancillary to mining.	Department of State Development, Business and Innovation (DSDBI)	In order to obtain a Mining Licence, a Work plan and work authority must be submitted to DSDBI. The Work plan would include a rehabilitation plan and environmental management plan.
Planning permit under the *Planning and Environment Act 1987*	Removal of native vegetation associated with the power line (note that mining activities are exempt)	Towong Shire Council	Under the MRSD Act the project would be exempt from requiring a planning permit if an EES is prepared for the project and approved by the Minister for Planning.
Cultural Heritage Management Plan (CHMP) under the *Aboriginal Cultural Heritage Act 2006*	Works considered a "high impact activity" within an areas of Cultural Heritage Sensitivity	Aboriginal Affairs Victoria, relevant Registered Aboriginal Parties (RAPs)	A mandatory CHMP is required for the project.

Approval/Consent /Referral	Trigger	Agencies	Comments
Consent or Permit under the *Heritage Act 1995*	Works or activities in relation to a registered place or registered object. Potential for impact on archaeological relics	Heritage Victoria	Heritage Act consents or permits may be required in relation to any sites listed on the Victorian Heritage Register or Inventory, or to the extent that there is potential for impact on archaeological relics. It is likely that any impacts to listed Heritage places can be avoided.
Consents or Permit under the *Water Act 1989*	Groundwater or surface water extraction Carrying out any works on waterways/ Construction of a dam or water storage	North East Catchment Management Authority	Will be required given the water requirements for the Project.
Consents or permits under the *Land Act 1958* and *Crown Land Reserves Act 1978*	Use and development of Crown Land	Department of Environment and Primary Industries (DEPI)	May be required. Confirmation from DEPI would need to be sought.
Consents or permits under the *Road Management Act 2004*	Works on roads including any upgrades or changes to the local road network	VicRoads	May be required for upgrades to the transport network. This needs to be confirmed.
Consents or permits under the *Flora and Fauna Guarantee Act 1988* (FFG Act)	Removal of protected flora on public land	Department of Environment and Primary Industries (DEPI)	Likely to be required given native vegetation removal on public land and the likely presence of FFG Act listed species.
New South Wales			
Review of Environmental Factors under the *Environmental Planning and Assessment Act 1979* (EP&A Act)	Development of power line by electricity supply authority.	Electricity supply authority	Dart Mining may be required to prepare a Review of Environmental Factors on behalf of the electricity supply authority.
Permit under the *National Parks and Wildlife Act 1974*	If Aboriginal items are present or likely to be present and an activity would harm those items.	Office of Environment and Heritage	The project triggers the requirement for an archaeological Due Diligence assessment. The Due Diligence assessment would act as a planning approvals document or inform if any Aboriginal Heritage Impact Permit (AHIP) would be required.
Excavation permit under the *Heritage Act 1977*	Disturbance or excavation of land where it is known or there is reasonable cause to suspect that a relic may be	NSW Heritage Council	May be required. There are possible heritage values associated with the site identified within the local planning scheme overlays for Tumbarumba Shire

Approval/Consent /Referral	Trigger	Agencies	Comments
	discovered, exposed, moved, damaged or destroyed.		Council.
Consent under the *Roads Act 1993*	Carrying out certain activities in, or over a public road.	Tumbarumba Shire Council for local roads. NSW Roads and Maritime Services for regional and state roads.	Likely to be required.

6. Future studies

The indicative approvals study scopes identified in Table 13 build on the outcomes of the pre-feasibility specialist scoping studies completed to date and reflect the likely approval requirements (section 5) and the outcomes of the issues screening process (section 4). The level of investigation would be reflective of the investigation categories assigned in Table 11 (i.e. Category A issues would require a higher level of investigation than Category B and Category C issues).

The general objective of the studies would be to identify the potential effects of the Project over its life on the environmental and social values of the region and identify measures that avoid, minimise or mitigate adverse effects to those identified values.

Table 13 Indicative study scopes for the assessment and approvals process

Study	Key issues for investigation
Risk Assessment	• Used to guide impact assessments, setting of proposed key performance indicators and development of management options in specialist studies.
Soils, Geochemistry and Mine Materials	• Potential effects of construction and operation activities on soil system including: – Stockpiling topsoil and subsoil; – Surface soil stability; – Erosion; – The exposure, management and disposal of any potentially problematic soils (both natural and anthropogenic); and – Potential implication for future site rehabilitation • Geology and geochemistry of the project area and the geochemistry of ore, tailings, waste rock material to be generated including estimated volumes and any acid generating potential and chemical composition; • Potential short and long term risks associated with the treatment, transport and disposal of waste rock and tailings. • Measures to avoid, minimise or manage any potential effects on identified environmental aspects or future land use activities.
Surface water, flooding and drainage	• Characterise surface water environments in the project area in terms of water quality, hydrology and ecology and protected beneficial uses. • Potential short and long term effects of construction and operation activities may have on surface water, flooding and drainage including effects on water supply to users and effects on relevant waters in the Upper Murray catchment. • Measures to avoid, minimise or manage any potential effects on identified environmental aspects. • Residual short and long term effects of the project on surface waterways downstream and in the project area.
Biodiversity and Habitat	• Potential direct or indirect effects the project may have on ecological communities or species of conservation significance (including any species or communities listed under the FFG Act and EPBC Act (if relevant)) and biodiversity values of affected areas. • Potential effects of the project on other ecological and conservation values, including areas of scientific or other conservation significance. • Measures to avoid, mitigate and manage biodiversity impacts in particular, with respect to native vegetation, habitat, listed

Study	Key issues for investigation
	threatened species and communities as well as ecological values of the State Forest. • Relevance to the project of Potentially Threatening Processes, as listed under the FFG Act or EPBC Act (if relevant), and outline mitigation approaches. • Obligations arising from Victorian Biodiversity Strategy and the NVMF. In particular, how vegetation removal has been avoided and minimised in accordance with the NVMF, as well as identifying suitable offsets options for unavoidable clearing of native vegetation. • Effect of linear infrastructure development and easements on terrestrial and aquatic habitats and wildlife corridors, including the risk of increasing the presence of weeds and pests. • Residual effects of the project on ecological and conservation values.
Groundwater	• Characterise the groundwater in the project area in terms of aquifer resources, quality and beneficial uses. • Potential effects of mining construction and operation activities (including seepage from water storages and mine dewatering) on groundwater and its beneficial uses in and around the project area. • Measures to avoid, mitigate and manage any potential effects. • Residual effects of project construction and operation activities on groundwater and current and potential beneficial uses in and around the project area in the short and long term.
Water Use	• Water supply requirements of mining and processing operations and available sources of water supply, and assess the potential impacts of usage on beneficial uses. • A water balance assessment for all water managed by the project including volumes and quality to meet project needs, water inputs and outputs, direct rainfall/runoff, potential harvesting from tailings storage facility (if any), processing requirements and additional water supply requirements. • Site design and management measures to maximise water reuse, manage site discharges (including treatment if required), transport water to and from project components, control site run-off (including seasonal variations, storm events and under different operating conditions). • Measures to manage risks of uncontrolled water discharge from project facilities.
Greenhouse Gases (GHG) and Energy Consumption	• The energy use and greenhouse gas emissions resulting from the construction and operation of the mine, including from direct sources (e.g. transport and land clearance, in-situ power generation) and indirect sources produced elsewhere during generation of consumables (e.g. electricity purchased from the grid). • Potential energy minimisation and GHG minimisation, for both direct (at site) and indirect (transportation) sources, including renewable power provision options and an estimate of resulting emission reductions. • Residual effects of the mine's GHG emissions and energy consumption.
Rehabilitation and Closure	• Proposed end use objectives and post closure landforms for the project area and how objectives would be achieved. • Rehabilitation methods to be investigated including a discussion of the suitability of these methods, and a program for implementing the methods. • Proposed rehabilitation performance standards and monitoring provisions including required species and diversity.

Study	Key issues for investigation
	• Post closure monitoring and management arrangements for the project area, including for water and vegetation. • Proposed means of resourcing and financing post-closure activities.
Land Use	• Current land use (including public land use), as well as planning scheme provisions and public infrastructure that supports current land uses in the project area. • Potential short- and long-term effects of the project on existing and potential future land uses and public infrastructure. • Proposed measures to avoid, mitigate and manage any potential adverse effects. • Residual effects of project on existing and potential future land uses. • Implications of likely effects on land use in the context of relevant planning scheme provisions.
Aboriginal Cultural Heritage	• Background on pre-contact and contemporary activities by Aboriginal people in the project area. • Consultation to gain the knowledge, values and views of local Aboriginal communities (including traditional owners and relevant Registered Aboriginal Parties). • Identification of cultural heritage sites located in the project area. • Potential for unknown sites in the area, highlighting any areas of cultural heritage sensitivity. • Potential effects of the proposed development on known significant sites and potential unknown sites. • Proposed measures to avoid, mitigate or manage potential effects on known and unknown sites of scientific or cultural significance. • Residual effects of the project on Aboriginal cultural heritage and values in the project area.
Non-Aboriginal Cultural Heritage	• Historic background of non-Aboriginal activities in the project area. • Identification of any non-Aboriginal heritage places of significance in the project area. • Potential effects of the proposed development on known significant sites and potential unknown sites. • Proposed measures to avoid, mitigate or manage potential effects on known and unknown sites of significance. • Residual effects of the project on non-Aboriginal heritage and values in the project area.
Air Quality	• Characterise the existing air quality environment and beneficial uses in the project area including potentially affected residences and recreational park/forest users. • Potential effects of project construction and operational activities on beneficial uses, with respect to related dust and air emissions. • Proposed measures to avoid, mitigate and manage any potential adverse effects including any relevant techniques or design measures to be employed during construction or operation. • Residual effects associated with the project on air quality and beneficial uses.
Noise and Vibration	• Characterise the existing noise environment and beneficial uses in the project area including potentially affected residences and recreational forest users. • Potential effects of project construction and operation activities including blasting on beneficial uses through an increase in noise and/or vibrations. • Measures to avoid, mitigate and manage any potential noise or vibration effects on beneficial uses and to ensure the project

Study	Key issues for investigation
	would comply with applicable noise policy. • Residual effects of the project from noise and blasting for beneficial uses.
Visual	• Characterise the existing viewshed and sensitive receptors in the project area. • Potential effects of the project on the visual amenity of identified sensitive receptors. • Measures to minimise and mitigate visual amenity effects. • Residual effects on the visual amenity of beneficial uses.
Social	• Characterise the existing community (including landholders, recreational users, nearby residents, nearby towns and associated communities and interest groups) within the project area. • Likely additions to the populations of nearby townships due to the project and the likely demographic characteristics of the additional population • Proposed recruitment policy and accommodation arrangements; • Potential positive and negative effects on residents and communities near the project area including those related to amenity, employment opportunities, community cohesion housing availability and affordability. • Proposed avoidance, mitigation and management measures to reduce potential adverse effects, address community concerns and optimise social benefits. • Residual effects on local communities
Economic	• Characterise the existing local and regional economy in terms of key income and employment generating activities and outputs. • Magnitude and distribution of likely effects of the project on relevant sectors of the state and regional economies, including tourism and industry and the employment implications of those effects. • Direct and indirect jobs created by construction and operation of the project and the extent to which supplies and services would be sourced locally. • Proposed funding arrangements and economic impacts of any upgrades of public infrastructure or services necessary for the project to proceed. • Potential short- and long-term effects on the local and regional economies including effects associated with potential changes in income, demographics, changes to supply and demand for products and services, including land and housing, and potential for localised price increases. • Proposed measures to maximise the realisation of economic benefits and reduce adverse economic effects of the project. • Residual significant economic costs and benefits of the project
Road, Traffic and Transport	• Proposed transport routes and infrastructure. • Characterise the current traffic conditions (including site access) and infrastructure (including forest roads) and road users in terms of capacity, travel times, safety and accessibility. • Project vehicle types, numbers and routes. • Potential effects of construction and operations on traffic movements, in particular the impact of heavy vehicle movements and the ability of existing roads to accommodate these potential effects. • Potential effects of installing mine infrastructure along or across roads. • Traffic management and safety principles for the construction and operation phase, covering (where appropriate) road safety, temporary or permanent road diversions, different traffic routes,

Study	Key issues for investigation
	hours of use, traffic speeds, types of vehicles and emergency services provisions. • Residual effects of project construction and operations on existing traffic conditions and infrastructure and road users.

7. Environmental Management Framework

Dart Mining currently has a system in place for the management of health, safety and environmental risks associated with the exploration phase of the Project. This system would be expanded to identify and manage environmental effects and hazards associated with construction, operation and closure of the Project.

Dart Mining would develop a defined and transparent environmental management system including a management framework and environmental management plan to define roles and responsibilities for environmental management throughout all project phases (construction through to post-closure), identify legal and other obligations including specific requirements of statutory approvals and consents obtained, identify environmental objectives and targets to facilitate environmental monitoring and management and provide a proposed program for evaluating outcomes, reviewing and revising management plans as well as auditing and reporting of performance.

The management system would be developed in accordance with the requirements of ISO 14001

8. Consultation Strategy

Dart Mining has established a Community Engagement Strategy that identifies key community stakeholders and documents the types of consultation undertaken to engage with the community. Dart Mining has hosted annual community meetings since 2011 in the Corryong and Biggara / Bunroy Valley communities, undertaken letter drops and engaged directly with local landholders. Dart Mining has engaged directly with the Towong Shire Council, has attended council meetings and regularly informs the council of its activities.

A Consultation Strategy would be developed for the Project that would expand the current engagement strategy to identify opportunities for community involvement as the Project progresses through the environmental and planning approvals process. The objective of community consultation would be to identify community issues of concern and the potential effects of the Project on community values and would assist in providing an outlet for community feedback on project options and potential mitigation measures.

Consultation with interested indigenous parties has occurred during the development of the Cultural Heritage Management Plan (CHMP) for the exploration program. Consultation with these indigenous parties would continue through the development of a CHMP for the Project.

9. References

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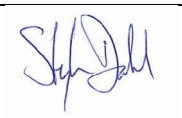
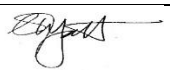
0	C Evans K Dortmans	Steve Dahl		Christine Wyatt		2/8/13

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