

15. Heritage

This Chapter documents the cultural heritage values of the site and assess the potential risks to those values from the Project. The potential impacts and associated mitigation measures identified in this chapter form the basis of the heritage component of the project risk assessment undertaken in Chapter 5. The project risk assessment includes consequence, likelihood and residual risk ratings for heritage impact after management measures are implemented.

This chapter is based on an Archaeological and Heritage Assessment for the Mt Todd Gold Project (Appendix Q) and a report on Jawoyn Ecological Knowledge (Appendix S).

The term “cultural heritage” includes, very broadly, all places and values of archaeological, traditional, historical or contemporary significance. Cultural heritage assessments investigate the value or significance of particular items, sites and places to the whole or particular sections of society and are one of the steps in the process of management and conservation of cultural heritage values. The cultural heritage assessment process operates on the basis that indigenous and non-indigenous cultural heritage should be conserved and protected and that project proponents have a statutory responsibility to protect such values.

15.1 Background

15.1.1 Indigenous Cultural Heritage Values

The project area comprises Mineral Leases MLN 1070, MLN 1071 and MLN 1127, held by Vista Gold Australia Pty Ltd. The Northern Territory Land Information System records the property as Northern Territory Parcel Numbers 4366 and 4389, vested in Barnjarn Aboriginal Corporation as Aboriginal freehold land granted under the Northern Territory *Aboriginal Land Act 1979*.

The project area sits within a broader region that has been occupied by Indigenous people for at least 35,000 years (Geneste *et al.* 2010).

The colonial period severely disrupted traditional Aboriginal culture and economy. An early report claims that Aboriginal people of the Pine Creek / Katherine region were almost entirely exterminated from a small pox epidemic of Macassan origins in the 1920s (Pearce 1982). Pearce (1982) writes that further declines were experienced with European contact and this partly resulted in clans amalgamating as their memberships diminished. Merlan (1998) found that of the 43 clans known to be Jawoyn, more than 25 were by that time extinct.

Evidence suggests that displacement from traditional homes was an early impact of the newcomer presence and as major centres grew along transport and communication routes and smaller settlements flourished, disturbance to important religious sites was inevitable (Resource Assessment Commission 1990). Aboriginal people at the time were highly mobile and making a living from a combination of traditional economy and partial integration into the mining and pastoral industries.

The difficulty of withstanding the pressures of contact was reflected in the traditional life of Aboriginal people. Both Pearce (1982) and the Resource Assessment Commission (1990) comment on loss and change. According to the Resource Assessment Commission, the growth of a settler community and the destruction of important religious sites rapidly altered clan affiliation to place. Aboriginal people began to

identify more with the greater expanse of territory encompassed by language. A change of emphasis on birth place emerged. Aboriginal connectedness to land has withstood the impacts of colonisation but emphasis on associations to place has changed. By the end of World War II, traditional living arrangements had been radically altered from clan-based practices to multiple-group congregations.

Jawoyn People

Jawoyn is an all-encompassing expression used in reference to language, culture, people and territory. Jawoyn heritage and traditional ownership of country is passed down from a Jawoyn father and in some cases, through a Jawoyn mother. It is the affiliation of one or both parents to Jawoyn country, connectedness to, and knowledge of, ancestral lands that makes one Jawoyn. Prior to contact with European settlers there were 43 clans making up the Jawoyn tribe, however many of these clans are now extinct or subsumed into other clan groups. Today, there are 17 clans making up the Jawoyn Nation and each of these clans lay claim to specific territory on Jawoyn country. There are about 600 adult Jawoyn people living today. Most Jawoyn live on or close to Jawoyn traditional lands, with the majority living close in, or around, Katherine and the communities of Werenbun, Barunga, Wagalarr (Beswick), Barunga and Mataranka (Pine Creek). Werenbun is the closest community to the project site.

Governance

Jawoyn governance structures have changed and evolved significantly since the Jawoyn land claim was recognised under the *Aboriginal Land Rights Act 1976*. The relationships and more formal partnerships that are involved in the management of Jawoyn Country are complex, multi-layered and have evolved for different purposes.

The key entities of relevance to the Project are the Jawoyn Association and the NLC.

15.2 Archaeological and Cultural Heritage Scope and Methodology

The scope of the Heritage study included Aboriginal archaeological sites and cultural heritage values outside of areas that are designated as Sacred Sites within the meaning of the Northern Territory Aboriginal Land Rights Act and the Aboriginal *Sacred Sites Act 1989*. The scope also included heritage and archaeological sites of Chinese and European origin known to exist within the project area. Sites of Chinese and European origin may also have significance to Aboriginal people.

The following scope of works was undertaken:

- ▶ review archaeological studies undertaken for the 1992 Zapopan NL Mt Todd Gold Project Draft EIS;
- ▶ examine the footprint of the proposed mine expansion and determine likely overlap with recorded archaeological and heritage objects or places as defined under the *Heritage Act 2011* (Heritage Act);
- ▶ assess the nature and distribution of any further archaeological / heritage places or materials located;
- ▶ assess the significance of any archaeological / heritage places or materials according to the heritage significance criteria established under the Heritage Act; and
- ▶ make recommendations on the mitigation of potential impacts on archaeological places or objects.

This study used a heritage assessment strategy to assess the likelihood of finding archaeological and or heritage sites. The strategy identifies selected parts of a project area to ground truth site distribution predictions made during the desktop study. Each land unit within a project area is sampled by a heritage team who record all features in that sample. Data is then used to build recommendations on the

likelihood of finding additional sites in other areas. Recommendations on future heritage management are then made based on the likelihood of sites occurring. Following this approach:

- ▶ a desktop assessment of information sources, such as previous reports for the area, the site database and the maps of Restricted Works Areas provided by the AAPA;
- ▶ selected footprint areas were sampled for sites that are protected under the Heritage Act; but have not been previously mapped;
- ▶ an audit of the 'known sites' was conducted using information from the Department of Lands, Planning and Environment (DLPE) site database and the background site reports. Where sites were re-located, they were re-recorded and added to project mapping. A list of the sites no longer in place was also compiled, which was the majority of sites recorded in the 1990s on the DLPE database; and
- ▶ some areas outside of the current footprint were sampled so to assess the likelihood of locating previously unrecorded sites across each land phase / unit.

Heritage Register Searches

Searches of the following heritage registers were undertaken to identify any places that are nominated, under assessment or declared as having cultural heritage value:

- ▶ Northern Territory Archaeological Database (maintained by DLPE);
- ▶ Northern Territory Heritage Register (statutory register maintained by DLPE);
- ▶ Commonwealth Heritage Database (formerly the Register of the National Estate (maintained by the SEWPaC);
- ▶ National Heritage List (maintained by SEWPaC); and
- ▶ Commonwealth Heritage List (maintained by SEWPaC).

There are a number of registered archaeological places and objects within the Katherine / Pine Creek region. A search of the registers for the project area located the following:

- ▶ the Northern Territory Archaeological Database and the Northern Territory Heritage Register hold information on 58 archaeological places and objects in the vicinity of Mt Todd (Table 1, Appendix Q). Many of these sites are now salvaged or destroyed;
- ▶ Permits under Section 39 of the *Heritage Conservation Act 1991* (previous to the Heritage Act) were obtained during former mine operations, however the text and mapping associated with these permits has not been relocated; and
- ▶ the Commonwealth Heritage Places Inventory lists the Mt Todd Battery and Settlement Site, Edith Falls Road, Katherine, as an "Indicative Place" on the Register of the National Estate (Place ID 16326, Place File Number 7/04/009/0013). An Indicative Place is a place listed on the former Register of the National Estate, but not yet considered for National or Commonwealth heritage listing.

Prior Archaeological Investigations

Archaeological and historical investigations specific to the Mt Todd Mineral Leases have been conducted in association with proposed mining developments on the site (Kinhill Engineers 1989; Lance 1990; NSR Environmental Consultants 1992; Paton 1993). Kinhill Engineers (1989) conducted research into the mining history of the Mt Todd Gold Project, in an unpublished report to Billiton. This report has not been

located in the current investigations, but was relied upon by both Lance and Paton in their archaeological investigations of the area.

Lance (1990) carried out fieldwork over six days in February 1990, with traditional custodian Peter Jatbula. This survey was significantly hampered by poor ground visibility, however they managed to locate three Aboriginal archaeological sites and four historical features. The archaeological sites were stone artefacts scatters, which also showed evidence of quarrying or knapping raw material. Lance recorded the Chinese oven, Jones Brothers Mine, Overland Telegraph Line and Mt Todd Battery historical features.

Paton undertook further fieldwork in November 1990 and 1992, for inclusion in the Environmental Impact Statement by NSR Environmental Consultants (1992). These surveys located 31 Aboriginal archaeological sites including ten quarry sites (Paton 1992). Many of these sites were going to be partially or completely destroyed by the expansion proposed at the time. Paton did not locate any historical sites in addition to those recorded by Lance (1990).

Paton (1993) was then engaged to undertake more detailed recording of the sites that would be destroyed or affected by the Zapopan mining program. Paton conducted further consultation with Traditional Owners and undertook an ethnographic study. He made detailed recording and analysis of the large quarry site (Mt Todd 26) and conducted a long range survey to ascertain the spatial distribution of raw material from the quarry. Paton also recorded 15 campsites in detail and excavated a small sample of sites along creek lines in an attempt to determine the time depth of occupation in the area.

15.2.1 Jawoyn Resource Knowledge

Background information on the Jawoyn people, their history, ecological knowledge and society was reviewed from available sources in the public domain.

The Jawoyn Association was consulted to identify the appropriate people who hold traditional ecological knowledge of the project area. The Association identified the following people as the appropriate Traditional Owners for the country on which the project area is situated:

- ▶ Bessie Coleman;
- ▶ Bianca Balmana;
- ▶ Roy Anderson; and
- ▶ Wesley Wilika.

With the assistance of a cultural heritage specialist these traditional owners were contacted and agreed to accompany two GHD ecologists on a visit to the project area with the intention of discussing plants and animals that occur in the area.

Fieldwork consisted of a combination of on-country walk overs and discussion sessions on the mine site over a two day period (21 and 22 February 2012). Consultations on site were conducted in culturally appropriate, separate male and female groups.

Plants and animals were discussed in the field as they were encountered. Information was recorded and photos taken where appropriate. Discussions about plants and animals contained in the Jawoyn Plants and Animals Book (Wiyinjorrotj *et al.* 2005) were also conducted.

Plant and animal knowledge was categorised. The categories used were:

- ▶ Ecology: Knowledge of the animal or plant's ecology i.e. behaviour, habitat, predator / prey or other relationship to other taxa (relationships between animals and plants could possibly be spiritual);
- ▶ Food: The plant or animal provided sustenance to people;
- ▶ Medicine: The plant or animal was used as a medicine for people;
- ▶ Spiritual: The plant or animal was used in ceremonies or in other spiritual ways; and
- ▶ Tool: The plant or animal was used to make tools, equipment (canoes, mattresses, etc.), dyes etc.

15.3 Results

15.3.1 2011 / 2012 Site Surveys

Site surveys located or re-recorded 20 Aboriginal archaeological sites in the project area (Table 15-1, Figure 15-1). The most significant site recorded was Mt Todd 26 – an extensive greywacke quarry, extraction and reduction site, one of the largest recorded in the Northern Territory (Plate 15-1 and Plate 15-2). The quarried greywacke was used in the manufacture of axes and blades. The scale of the site may indicate that it was a source for trade objects. Paton (1993) undertook an extensive investigation of the site during fieldwork in 1992. Estimates of the number of artefacts in this site range up to 45 million. This site is disturbed on its peripheries by the existing Batman Pit and WRD.

A total of 119 isolated artefacts were found in the 2011 surveys on the Mineral Leases. The majority of these were stone artefacts, manufactured from locally sourced greywacke. A number of the isolated artefacts were partially manufactured axes, indicating a multi-stage manufacturing process at a distance from the material source. A scarred tree was recorded, evidence of access to “sugar bag” honey.

Based on the survey coverage of 130ha, the density of this background scatter of artefacts equates to approximately one artefact per hectare. This is likely to be an underestimate of true artefact density across the landscape, as the survey was affected by variation in visibility. The landscape sampling strategy, particularly in the diversion drain survey, was non-random and may also skew this result.



Plate 15-1 Cores and Reduced Axe and Blades, Mt Todd 26



Plate 15-2 Core measuring approximately 60cm x 40cm, Mt Todd 26

Table 15-1 Aboriginal Archaeological Sites

Site ID	Site Features	Significance	Description	Relationship to proposed works	Artefact types
Mt Todd 06	Minor Lithic scatter	Low	Low density artefact scatter	Located within WRD expansion area	Axe blanks, flakes, flake pieces, unifacial point
Mt Todd Powerline 15	Minor Lithic scatter	Low	Re-recorded site (see Mulvaney 1995)	West side of existing power line track, outside of planned impact area	See Mulvaney (1995) report
Mt Todd 26	Quarry and reduction site complex	High	Quarry, extraction and reduction site extending across large area	Partially within the boundary of the WRD and Batman Pit expansions. Part of the site has been permitted for salvage while a larger part has been included in a Sacred Site Restricted Works Area	Cores, flakes, broken flake, blade blanks with some retouch and platform prep, unifacial points, bifacial points and debitage
Mt Todd 28	Lithic scatter	Medium	Re-recorded site	Outside of planned impact area	Flakes, broken flakes, cores, blades
Mt Todd 29	Minor Lithic scatter	Low	Re-recorded site	Outside of planned impact area	Flakes, broken flakes, cores
Mt Todd 31	Minor Lithic scatter	Low	Background artefact scatter, four artefacts	Within proposed TSF2 area	Axe, blade, two retouched flakes
Mt Todd 32	Lithic scatter	Medium	Open site lithic scatter	Outside proposed footprint	Flake, retouched flake, broken flake, flaked piece, blade, unifacial point, bifacial point
Mt Todd 33	Minor Lithic scatter	Low	Artefact scatter low density	Within proposed TSF2 area	Flakes, broken flakes, flake pieces, bifacial and unifacial points

Mt Todd Gold Project
DRAFT ENVIRONMENTAL IMPACT STATEMENT

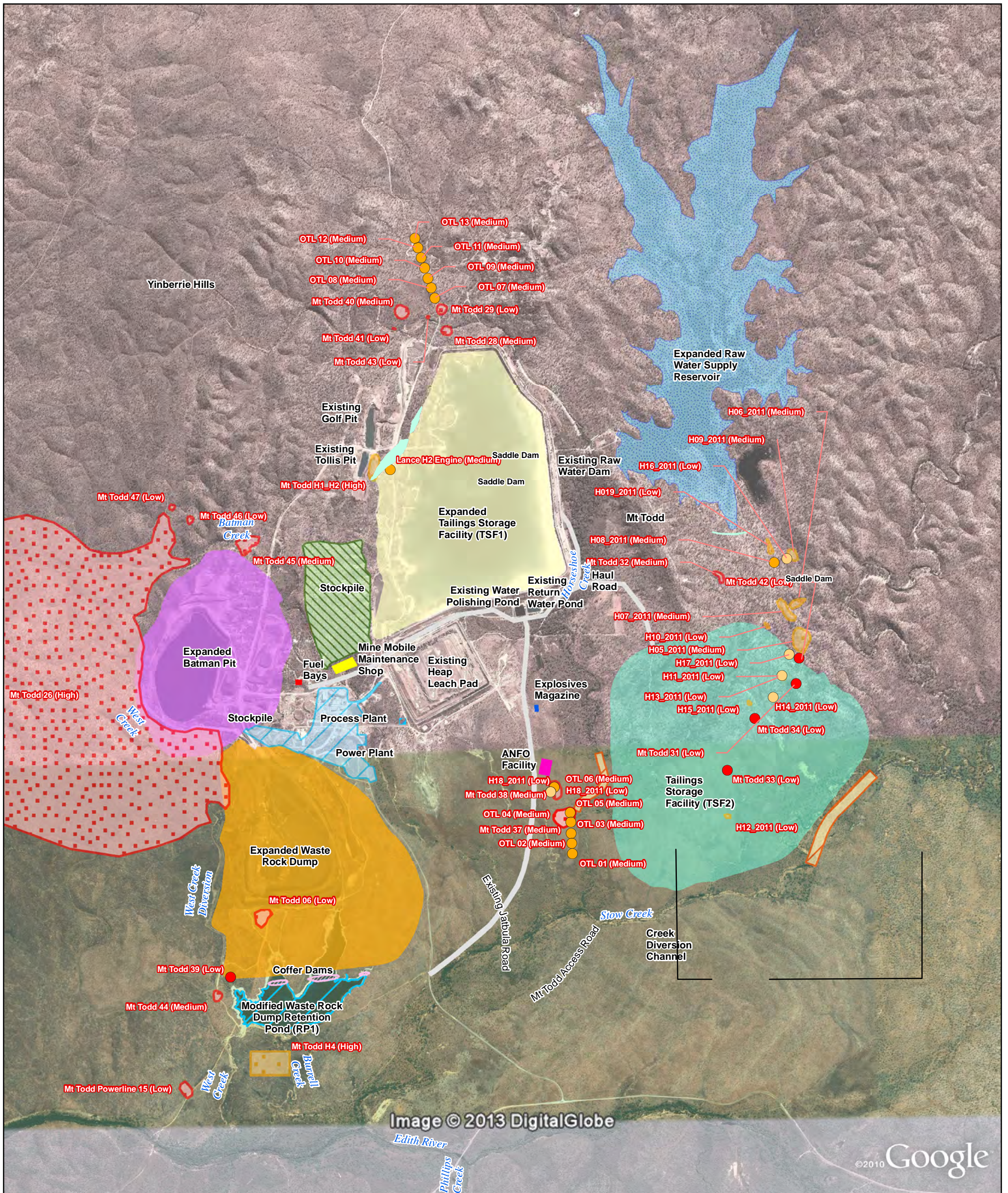


Site ID	Site Features	Significance	Description	Relationship to proposed works	Artefact types
Mt Todd 34	Minor Lithic scatter	Low	Small artefact scatter on small Burrell Creek Formation sandstone outcrop	Within proposed TSF2 area	Broken flakes, flake, broken blade
Mt Todd 37	Quarry, reduction site, Overland Telegraph (OT) Line	Medium	Large artefact scatter and quarry,	Potentially within the area to be used for access tracks, and Horseshoe Creek Diversion, south of ANFO, west of TSF2	Flakes, broken flakes, blades, OT wire and tools, unifacial and bifacial points, stone axe hornfels quarry, several discrete reduction areas, grinding surface
Mt Todd 38	Quarry and reduction site	Medium	High density greywacke quarry and initial reduction site	Outside proposed footprint, potentially impacted by Horseshoe Creek Diversion and access tracks	Core, blades, axe blanks
Mt Todd 39	Minor Lithic scatter	Low	Low density artefact scatter	Located within WRD expansion area	Flakes, flaked piece, broken flakes, axe blanks, blanks, retouched blades, core
Mt Todd 40	Lithic scatter	Medium	Low density artefact scatter with high density concentrations	Outside of planned impact area	Flakes, flaked pieces, broken flakes, axe blanks, blade with retouched margins, blade, core
Mt Todd 41	Minor Lithic scatter	Low	Knapping floor and artefact scatter	Cut by margins of water diversion drains	Core, blade, flaked piece, broken flakes, unifacial point
Mt Todd 42	Minor Lithic scatter	Low	Small background scatter	Located on north eastern margin of proposed TSF2. Likely to be impacted	Flake, broken flake

Mt Todd Gold Project
DRAFT ENVIRONMENTAL IMPACT STATEMENT

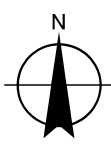
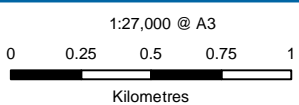


Site ID	Site Features	Significance	Description	Relationship to proposed works	Artefact types
Mt Todd 43	Lithic scatter	Low	Knapping floor and artefact scatter	Cut by margins of water diversion drains	Blade, retouched unifacial point, flakes, flaked piece, broken flakes, core
Mt Todd 44	Lithic scatter	Medium	High density artefact scatter, large site	Near impact zone for planned diversion drains	Axe, anvil, retouched blade, unifacial points, flakes, flaked pieces, broken flakes, core
Mt Todd 45	Lithic scatter	Medium	Low density artefact scatter with high density clusters	Outside of planned impact area	Flake, broken flakes, cores, quarry blades with retouched margin
Mt Todd 46	Minor Lithic Scatter	Low	Low density artefact scatter	Outside of planned impact area	Flake, broken flakes, cores
Mt Todd 47	Lithic scatter	Low	Low density artefact scatter	Outside of planned impact area	Flake, broken flakes, cores, blade with retouched margin



LEGEND

Aboriginal and Heritage Sites	Diversion Channel	ANFO Facility	Mt Todd Access Road
Aboriginal and Heritage Sites	Fuel Bays	Explosives Magazine	Water Treatment Plant
Coffers Dams	Maintenance Shop	Expanded Waste Rock Dump	Saddle Dam
Modified Waste Rock Dump Retention Pond (RP1)	Stockpile	Expanded Batman Pit	Expanded Raw Water Supply Reservoir
Mine Facilities	Tailings Storage Facility (TSF2)	Modified Tailings Storage Facility 1	



Vista Gold Australia Pty Ltd
Mt Todd Gold Project

Job Number | 43-21801
Revision | 1
Date | 30 May 2013

Distribution of Sites

Figure 15-1

15.3.2 Non-indigenous Cultural Heritage Values

Following John McDougall Stuart's journey through the area in 1862, and the establishment of Port Darwin in 1869, the project area was included in the route of the Overland Telegraph Line (OTL). During construction of the OTL in 1872, gold was discovered in the area. Gold, tin, copper and wolfram have been mined in the project area intermittently ever since.

While mining has been the principal industry of the Pine Creek District, mining ventures, regardless of the mineral being mined, have a history of being short-lived and recurrent, and concomitantly mining populations have swollen and shrunk (Bell 1983, Resource Assessment Commission 1990). Early mining ventures struggled with geographic isolation, severe climatic and environmental conditions, and mismanagement.

The success of mining in the Pine Creek District, especially in its pioneering period, very much depended on a substantial Chinese population which became the backbone of the industry. By the 1880s, thousands of Chinese miners were working in the Pine Creek District and until 1911 were the dominant presence (sometimes outnumbering Europeans 16:1) (Donovan 1979). Some of this influx came from the employment of Chinese labourers for the construction of a railway to the district. Following the completion of the railway many stayed on in mining capacities (National Trust, Northern Territory).

The 2011 survey identified 31 historical features, including mining shafts (Plate 15-3) and associated artefacts, and OTL features (Table 15 2, Figure 15 1). Some of the mining sites exhibited evidence of Chinese origin in their mining methods and also in the associated artefacts. Some mining sites also showed indications of multiple periods of occupation. The OTL poles are very good examples of Oppenheimer poles, which were introduced to combat termite problems encountered with timber poles (Plate 15-4). One of the sections of OTL also retains a rare example of line repair.



Plate 15-3 Multiple Shafts and Pits, Site H05_2011



Plate 15-4 Oppenheimer Pole in Good Condition

Table 15-2 Historical Features

Name	Site type	Significance	Description
H05_2011	Mining	Medium	Pits, shafts, artefacts associated with early Chinese mining
H06_2011	Mining	Medium	Shaft approx. 7m deep, artefacts associated with early Chinese mining
H07_2011	Mining	Medium	Probable Chinese origin. Artefacts of Chinese and other origin. Isolated stone artefacts
H08_2011	Mining	Medium	Pits, metals, enamel bowl, green bottle glass, probable Chinese origin
H09_2011	Mining	Medium	Chinese mining and domestic camp
H10_2011	Mining	Low	Small pits, probable Chinese origin
H11_2011	Mining	Low	Small pits, probable Chinese origin
H12_2011	Mining	Low	Six shallow pits, hand dug, Tuff flake collocated with fragments of green bottle glass
H13_2011	Mining	Low	Two small pits, fragments of green bottle glass
H14_2011	Mining	Low	Small pits, probable Chinese origin
H15_2011	Mining	Low	Trench and pits, probable Chinese origin
H16_2011	Mining	Low	Small pits, shafts, green bottle glass, ceramic shards probable Chinese origin
H17_2011	Mining	Low	Small stone arrangement, probable Chinese origin, purpose unknown
H18_2011	Mining	Low	Small pit, 2m long, 1.25m deep, spoil to NW probable Chinese origin
H019_2011	Mining	Low	Pits, mining artefacts, probable Chinese origin

Name	Site type	Significance	Description
Lance H2 Engine	Mining	Medium	Early diesel engine for Jones Bros Mine crusher
Mt Todd H1_H2	Mining	High	Chinese pig ovens, includes Jones Bros Mine. Large shafts and pits, three ovens, metal buckets plus other artefacts
Mt Todd H4	Mining	High	Mt Todd Battery Site. Recorded on Commonwealth Database as significant
OTL 01	OTL Oppenheimer	Medium	Oppenheimer pole and wire
OTL 02	OTL Oppenheimer	Medium	Oppenheimer pole and wire
OTL 03	OTL Oppenheimer	Medium	Oppenheimer pole and wire
OTL 04	OTL Oppenheimer	Medium	Oppenheimer pole and wire
OTL 05	OTL Oppenheimer	Medium	Oppenheimer pole and wire
OTL 06	OTL Oppenheimer	Medium	OTL Oppenheimer pole
OTL 07	OTL Oppenheimer	Medium	Oppenheimer pole, Bent to ground level
OTL 08	OTL Oppenheimer	Medium	Oppenheimer pole, upright wire remains
OTL 09	OTL Oppenheimer	Medium	Upright Oppenheimer pole with wire
OTL 10	OTL Oppenheimer	Medium	Oppenheimer pole, Partially bent pole, wire remains
OTL 11	OTL Oppenheimer	Medium	Oppenheimer pole, Partially bent pole
OTL 12	OTL Oppenheimer	Medium	Oppenheimer pole, Pole bent approx. 45 degrees, wire on ground
OTL 13	OTL Oppenheimer	Medium	Upright Oppenheimer pole, Heavier pole girth 36cm

15.3.3 Jawoyn Resource Knowledge

A total of 62 animal, 63 plant and one fungal species were identified and discussed, and the associated Jawoyn knowledge recorded. Table 15-3 provides a breakdown of knowledge type by category. Some species occur in more than one category. Appendix S provides a detailed discussion on each species.

Table 15-3 Animal and Plant Knowledge by Category

Knowledge Type	Animal Knowledge Type by Category (number)	Plant Knowledge Type by Category (number)
Ecology	31	16
Food	34	40
Medicine	1	4
Spiritual	1	2
Tool	4	29

Three broad landscape units were identified in the mine site area during consultation: woodlands, hills and riparian (including aquatic) environments. Their characteristics and the Jawoyn knowledge about the environments are described below. Additional environments of Jawoyn country are mentioned but as they are not represented in the Mineral Leases, these are not discussed in detail.

Woodlands

These environments are widespread across the Mineral Leases and cover the majority of the area. They are mostly low, open eucalypt forests with a sparse shrub layer and a ground layer dominated by annual grasses and herbs during the Wet Season. During the Pangkarrang, Malapparr and Jungalk (Dry Season) the ground layer of the woodland becomes dry and the plants senescent. Widespread fires burn across the woodlands, reducing the ground layer to bare ground.

Animal food resources of importance in the woodland environments include the frill-necked lizard (Plate 15-5). Some foods are eaten by the elders or are considered food for the 'old people'. It is unclear if this means they were foods of a past era and young people don't eat them or are foods that are reserved for the elders. This includes the black-headed python.

Plant food resources of importance in the woodland environments include wild grape (*Ampelocissus acetosa* (Plate 15-6) and *A. frutescens*), black currant (*Antidesma ghesaembilla*), *Gardenia megasperma*, bush banana (*Marsdenia australis*), pandanus (*Pandanus spiralis*), tacca (*Tacca leontopetaloides*) and nut tree (*Terminalia grandiflora*).

Useful plants of importance in the woodland environments include *Acacia spp.*, tree orchid (*Cymbidium canaliculatum*), bats wing coral tree (*Erythrina vespertilio*) and pandanus (*Pandanus spiralis*).



Plate 15-5 Frill-necked Lizard *Chlamydosaurus kingii*



Plate 15-6 Wild Grape *Ampelocissus acetosa*

Hills

These environments occur on Mt Todd and the hills in the eastern and western parts of the Mineral Leases. Like the woodlands they are characterised by eucalyptus forests with a sparse shrub layer and a ground layer dominated by annual grasses and herbs during the Wet Season. During the Pangkarrang, Malapparr and Jungalk (Dry Season) the ground layer of the hills becomes dry and the plants senescent. Widespread fires burn across the hills, reducing the ground layer to bare ground. The ground surface is notably rocky, separating this landscape type from the woodlands.

The hilly environments were used by people during the Wet Season as they were environments free from flooding. People also knew that several animal resources moved to the hilly country in the Wet Season to escape the flooding. It was recognised that hunting was easier on the hills in the Wet Season due to the greater visibility afforded by shorter speargrasses compared to the woodlands of the lower country where the speargrasses often grew well above head height.

Animal food resources of significance include the echidna, northern brown bandicoot and the northern brushtail possum. Plants with utility value from these environments include *Ficus aculeata*.

Riparian

These environments occur across the mineral leases as taller eucalypt woodlands in drainage lines and riparian forests of paperbarks and pandanus. Included in this landscape group are the resources that may be available in the waters of the streams, creeks and pools. Across the Mineral leases, they exist along and in the Edith River and its tributaries (Stow Creek, Horseshoe Creek, Batman Creek, Burrell Creek and West Creek) and ephemeral drainage lines. Some of these aquatic environments are ephemeral, occurring only during the Wet Season as a response to the surface water runoff from monsoonal rain before receding to chains of pools and drying out late in the Wet Season. Others have sufficient base flow to remain as flowing watercourses throughout the Dry Season.

Based on the Jawoyn ecological information recorded during this study, they contain the most resources of all the landscape groups in the Mineral Leases. These environments are particularly significant as fishing is still practiced by a large number of people.

Animal food resources of importance include the sand frog, bush turkey (associated with riparian environments as it is found in the open floodplains), ibis, pelican, barramundi, big black catfish, black bream, blue catfish, jewfish, file snake, turtles (long neck, saw shell and short neck) and water monitor.

Food resources eaten in a former time and no longer eaten by people include the jabiru, freshwater crabs, freshwater mussels, black flying-fox, little red flying-fox and freshwater crocodile. Some foods are eaten by the elders or are considered food for the 'old people' (it is unclear if this means they were foods of a past era and young people don't eat them or are foods that are reserved for the elders). This includes the olive python.

Plant food resources of these environments include bush potato (*Brachystelma glabriflorum*), bush cucumber (*Cucumis melo*) (Plate 15-7), *Cyclophyllum schultzei*, *Dioscorea* sp., long yam (*Dioscorea transversa*), cluster fig (*Ficus racemosa*), paperbarks (*Melaleuca* spp.), Leichhardt Tree (*Nauclea orientalis*), water lily (*Nymphaeoides crenata*), pandanus (*Pandanus aquaticus*), gooseberry (*Physalis minima*), bush tomato (*Solanum echinatum*), bush apple (*Syzygium* sp.), red bush apple (*Syzygium suborbiculare*) and black plum (*Vitex glabrata*).

Plant medicine resources of importance include the river fig (*Ficus coronulata*).

Useful plants of importance include bamboo (*Bambusa arnhemica*), sedges (*Cyperus* sp.) (Plate 15-8), kerosene wood (*Erythroxylum ellipticum*), Paperbarks (*Melaleuca* spp.) and Leichhardt Tree (*Nauclea orientalis*).



Plate 15-7 Bush Cucumber *Cucumis melo*

Plate 15-8 Sedges *Cyperus* sp.

Widespread

Many plants and animals do not specifically occur in any one vegetation type.

Animal food resources of importance and of widespread occurrence include the emu, green ant, native bees, macropods and sand goanna.

Animal medicine resources of importance include the green ant nest.

Plant food resources of importance include kurrajong (*Brachychiton diversifolius* (Plate 15-9) and *B. megaphyllus*), green plum (*Buchanania obovata*), *Cartonema spicatum*, kapok bush (*Cochlospermum fraseri*), *Cymbopogon* sp., ironwood (*Erythrophleum chlorostachys*), *Grewia retusifolia*, giant speargrass

(*Heteropogon triticeus*) (Plate 15-10), billy goat plum (*Terminalia ferdinandiana*), *Terminalia* sp. and *Vigna vexillata*.



Plate 15-9 Kurrajong *Brachychiton diversifolius*



Plate 15-10 Giant Speargrass *Heteropogon triticeus*

Useful plants of importance include cockatoo grass (*Alloteropsis semialata*), kurrajong (*Brachychiton diversifolius* and *B. megaphyllus*), green plum (*Buchanania obovata*), Cypress pine (*Callitris intratropica*), *Cayratia trifolia*, *Eriachne ciliata*, ironwood (*Erythrophleum chlorostachys*), stringybark (*Eucalyptus tetrodonta*), bloodwood (*Eucalyptus / Corymbia* spp.), purple pea (*Galactia muelleri*), red root (*Haemodorum coccineum*), cocky apple (*Planchonia careya*), *Pterocaulon serrulatum* and spinifex (*Triodia bitextura*).

Two widespread trees have spiritual importance for ceremonial uses: large, hollow gums (such as the salmon gums) and the ironwood (*Erythrophleum chlorostachys*).

Escarpment and Outcrop

These environments occur in Jawoyn country along the Arnhem Escarpment and its outliers but not within the Mineral Leases. The knowledge shared of animals inhabiting these environments was ecological in nature and not regarding resources of utility.

Plant food resources of importance include *Cynanchum pedunculatum* and *Flueggea virosa*.

Monsoon Vine Forest

These environments are within Jawoyn country but not within the Mineral Leases. The only plant knowledge shared relating to these environments was that of one edible plant: bush pumpkin (*Amorphophallus paeoniifolius*).

15.4 Potential Impacts

15.4.1 Construction

Construction activities associated with the Project have the potential to impact indigenous and non-indigenous cultural heritage values, primarily through the disturbance or destruction of sites. Several sites are likely to be impacted through the construction of access tracks (e.g. Mt Todd 37) and diversion drains (e.g. Mt Todd 41 and 43).

15.4.2 Development of the Extraction, Processing and Disposal Facilities

Expansion of the Batman Pit and WRD has the potential to encroach on a number of Aboriginal heritage sites. The existing footprint of the Batman Pit has previously encroached on the margin of the site described as Mt Todd 26. The proposed footprint of the enlarged Batman Pit will result in a marginal expansion of this encroachment. The expanded WRD will encroach on Mt Todd 26 and result in the destruction of Mt Todd 06 and Mt Todd 39. The new TSF2 will potentially disturb Mt Todd 42, and destroy Mt Todd 31, Mt Todd 33 and Mt Todd 34.

15.4.3 Significance Assessment

Heritage Assessment Processes

Archaeological and historic sites can be significant in a number of ways:

- ▶ significant to a group or many groups of people due to their connection to the past;
- ▶ sites that are significant to a specific group of people because they have religious or spiritual significance to those people (dreaming sites or story places for example, Anzac Cove to Australians);
- ▶ sites that are significant because of their research potential: the importance of the site in answering questions about past human behaviours (i.e. archaeological sites); and
- ▶ sites that are significant due to their representativeness or uniqueness: sites or places that are rare or unique and are therefore conserved as a representative sample.

It follows from this that the significance of sites is assessed using methodologies appropriate to the type of significance concerned. For example:

- ▶ the significance of Aboriginal sacred sites, and other important sites, should be assessed by the relevant Aboriginal custodians or owners. This principle is enshrined in the Commonwealth *Native Title Act 1993* and the Northern Territory Aboriginal Land Rights Act;
- ▶ the significance of historic sites is decided by the wider community through a Heritage Council or other community represented group. These Councils often set up significance criteria and significance benchmarking to answer the question 'is it significant enough to conserve?'; and
- ▶ sites that may be of scientific significance are assessed by the same process, however often after considering specialist recommendations (i.e. archaeologists, environmental scientists, geologists).

When applied in the Northern Territory, the heritage assessment process occurs under the auspices of the Heritage Act Heritage Assessment Criteria, Regulations to the Heritage Act). Decisions on what can be considered significant to the heritage of the Northern Territory are made in consideration of these criteria. Once a place is shown to satisfy any of the criteria, it must also be shown to reach a threshold of being 'significant enough' to warrant permanent protection under Chapter 2 of the Heritage Act (Northern Territory Heritage Register).

15.4.4 Northern Territory Heritage Act 2011, Heritage Assessment Criteria

The Heritage Assessment Criteria for a place or object under the Heritage Act are as follows:

- (a) whether it is important to the course, or pattern, of the Territory's cultural or natural history;
- (b) whether it possesses uncommon, rare or endangered aspects of the Territory's cultural or natural history;

- (c) whether it has potential to yield information that will contribute to an understanding of the Territory's cultural or natural history;
- (d) whether it is important in demonstrating the principal characteristics of a class of cultural or natural places or environments;
- (e) whether it is important in exhibiting particular aesthetic characteristics;
- (f) whether it is important in demonstrating a high degree of creative or technical achievement during a particular period;
- (g) whether it has a strong or special association with a particular community or cultural group for social, cultural or spiritual reasons, including the significance of a place to Aboriginal people as part of their continuing and developing cultural traditions;
- (h) whether it has a special association with the life or works of a person, or group of persons, of importance in the Territory's history.

Following assessment of significance, the future conservation of a heritage place is considered by weighing up the level of assigned significance against the practicality of conserving the place. These issues may include the level of disturbance already experienced at the site. For example, an archaeological site may end up placed on an 'island' surrounded by a large quarry or waste rock dump, therefore destroying the natural context of the site.

In the Northern Territory, the significance of a place or object is considered by the Heritage Council. The Council then advises the Minister for Lands, Planning and Environment if they recommend the place or object be declared as a heritage place. The Minister must weigh up the views of the Council against the broader social and economic implications of conserving a place. For example, conservation of a place may be of considerable value socially and to the tourist industry, but may prevent a mining development. Therefore, the Minister must consider all views when making a decision.

The above process applies to places nominated for listing under Chapter 2 of the Heritage Act. In practice, few archaeological places are assessed to be added to the register; rather they either receive a work approval or are avoided in the course of works. However, they are considered under the same criteria as all other heritage places in the Northern Territory.

Significance of Aboriginal and Historic Places in the Project Area

Following the above methodology, all sites and isolated artifacts identified during the survey were assessed considering the following:

- ▶ do they satisfy any of the Heritage Assessment Criteria?;
- ▶ what are the disturbance factors impacting on the site?;
- ▶ if sites are left *in situ*, will the environmental context surrounding the site be left as is, and if disturbed, will this impact on the significance of the site?; and
- ▶ if a site satisfies criteria (h), (j) and or (k), will more information be provided by salvaging the site and assessing the archaeological record?

The sections below outline the assessment of sites recorded during the survey.

15.4.5 Sites of High Significance

Mt Todd 26 (Paton 1991 - 1993)

Mt Todd 26 is assessed as having high Aboriginal cultural and archaeological significance. It is important for cultural and scientific reasons as it demonstrates past technology manufacture and resource management and has the potential to inform our understanding of past settlement patterns, trading routes and population mobility. This site is potentially the largest quarry site located thus far in the Top End, and may be the source of raw material for the hundreds of greywacke artifact scatters that occur between Mt Todd and Frances Creek to the north. The distribution of this material may indicate a previously unreported trade route linking the Mt Todd area with other Jawoyn groups and possibly as far as Western Arnhem Land and to what is now the Daly River area.

The Aboriginal cultural heritage significance of this site was tested in September 2011 and May 2012. Ryan Barawei and Bessie Coleman attended the site following a meeting at the Jawoyn Association offices in Katherine. Ryan and Bessie, speaking for the senior Traditional Owners of the place rather than for Jawoyn Association, said that they would like to see the site avoided in the course of works, creating an exclusion zone around the site. The informants also stated that they would like to see the mine go ahead, however they thought that the major sites should be avoided. They also stated that it was okay if the isolated artifacts and small Aboriginal sites were permitted for disturbance. Bessie also stated that the Chinese mining sites should be protected as well, however, there wasn't the time to visit these sites on the day.

In March 2012, the site was visited by Gareth Lewis from AAPA and a number of senior site custodians. At a meeting on-site, the significance and condition of Mt Todd 26 was discussed. The resulting AAPA Certificate was sent to Vista Gold during July 2012, containing part of site Mt Todd 26 in a Restricted Works Area (RWA).

As noted previously, disturbance of any Aboriginal archaeological place or artifact is illegal under the Heritage Act, unless a works approval is issued by either the Heritage Council or the Minister for Lands, Planning and Environment (major works). It is recommended to conserve this site *in situ*, fence off to avoid unplanned impacts, close tracks that pass through the site and nominate the site to the Northern Territory Heritage Register. Vista Gold has applied for a works approval over the south east corner of Mt Todd 26, which is in the proposed impact areas of the new mine, but outside the RWA. This permit was granted under Section 29/39 of the former *Heritage Conservation Act 1991*, but remains current under the transition provisions of the new Act.

Mt Todd H1_H2 (DLPE Database Site)

Mt Todd H1_H2 is an extensive mining site, with numerous large shafts and adits. The site includes three ovens of stone construction, one of which is almost 3m x 3m in size. It is possible this site is the former Jones Brothers Mine Site, however due to inaccuracy in the Northern Territory DLPE Archaeological Database; further investigations will be required to more fully understand the history of the site. The site was recorded in conditions of poor visibility. Large metal artifacts such as buckets and other mining equipment were located.

Mt Todd H1_H2 has previously been fenced and signposted alerting visitors to the danger posed by the deep shafts. This fencing and signage needs upgrading, as it has deteriorated in places.

15.4.6 Sites of Medium Significance

Seven sites have been assessed as having medium archaeological and Aboriginal cultural significance. Mt Todd 37 and Mt Todd 38 are quarry sites and open artifact scatters. The outcropping stone is different to that found in Mt Todd 26 and across the Mineral Leases, though it has also been used for axe and blade manufacture. These sites have the capacity to inform our understanding of resource management, technology manufacture and trade.

It is recommended to avoid these sites during the course of works. If it is necessary to disturb them, it is recommended that a work approval be obtained, and the sites be fully recorded and salvaged according to accepted archaeological methodology.

The remnants of the OTL and seven mining sites of probable Chinese origin are assessed as having medium historical significance. While no work approval is required to disturb historical sites, it is recommended that the sites of medium historical significance are conserved in situ where possible.

15.4.7 Sites of Low Significance

The remaining small mining sites, stone artifact scatters and isolated artifacts were assessed as having low significance. The management recommendation for Aboriginal sites within the proposed TSF2 footprint is to apply for a work approval, and then salvage using an acceptable archaeological methodology. No application for work approval is required for the historical sites.

15.4.8 Jawoyn Resource Knowledge

In contemporary times, hunting and foraging methods have changed somewhat such that nowadays people hunt with guns and fishing lines rather than spears, throwing sticks and hand-woven line. Similarly there are many bush foods and medicines that are no longer eaten or administered.

Despite this the knowledge of how to gather and prepare these foods and medicines is still disseminated by those who hold this information.

Amongst the Jawoyn traditional owners, the mine site is not considered a notably productive environment. It was expressed by these people that the plants and animals encountered and discussed during the ecological knowledge consultation are widespread and not unique to the mine site.

15.5 Management

The following management measures are recommended:

- ▶ ensure all AAPA certificates are current for the project area;
- ▶ clearly demarcate (including additional buffer / standoff) in field areas of heritage significance and create no go areas where necessary;
- ▶ avoid where possible the major sites identified including the undisturbed sections of Mt Todd 26, Mt Todd H1_H2, Mt Todd 37 and Mt Todd 38, the larger stone artefact sites, the Overland Telegraph Line sites and the larger early mining sites. If this proves not possible, seek appropriate work approvals under the Heritage Act for the archaeological recording and salvage of these sites. Salvage works will be completed with Traditional Owner support, consultation and field assistance;

- ▶ identify sacred sites within close proximity of open pit crest and develop and implement a suitably robust and appropriate Ground Control Management Plant including comprehensive slope design verification, protection measures and monitoring routines.
- ▶ to gain approval to disturb an Aboriginal cultural site a detailed plan for artefacts recovered from site will be required including how a site will be salvaged, what will become of the artefacts and how the artefacts and other materials will be analysed;
- ▶ complete and implement a Cultural Heritage Management Plan (CHMP) prior to commencement of invasive exploration and mining works (Appendix R). This plan should include:
 - the implementation of an in-house ground disturbance approval process;
 - measures to protect heritage sites;
 - completion of 100% heritage surveys prior to ground disturbance;
 - engagement of the Traditional Owners and Site Custodians in heritage management decision making; and
 - implementation of a cultural heritage induction for all staff and contractors as part of the general site induction.
- ▶ for the low significance Aboriginal archaeological sites located in proposed work areas, which cannot be avoided in the course of works, commence applications for work approval under the Heritage Act. Decisions regarding the future curation of any artefacts collected should be made in consultation with the Traditional Owners of the land; and
- ▶ complete an archaeological survey of any new areas outside those included in this assessment prior to any ground disturbing works, in accordance with a Scope of Works provided by the Heritage Branch, DLPE.