

FRANCES CREEK PROJECT,
NORTHERN TERRITORY:
PUBLIC ENVIRONMENTAL REPORT
EXECUTIVE SUMMARY

AUGUST 2006

PREPARED FOR
TERRITORY IRON LIMITED

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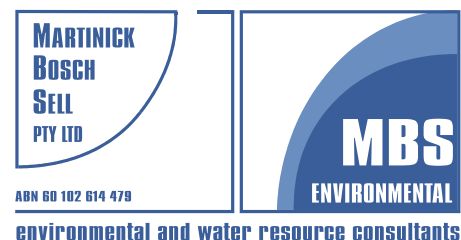


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1. INTRODUCTION

Territory Iron Limited proposes to develop an open cut iron ore mining operation at Frances Creek, 180 kilometres south-east of Darwin (Figures 1 and 2). The proposed operation will be on the site of the previous Frances Creek Iron Ore mine, which operated from 1967 to 1974. It will use remaining infrastructure from the previous operation. Three of five pits will be extensions of existing pits.

1.1 PROPONENT DETAILS

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1.2 PROJECT LOCATION

The project area regional location is shown in Figure 1. Figure 2 shows more detail of the area from Pine Creek to Frances Creek. The project area is:

- 180 kilometres south-east of Darwin.
- 25 kilometres north of Pine Creek.
- About 30 kilometres south of Mary River National Park and 19 kilometres west of the Kakadu National Park boundary.
- Within the Mary River catchment.

By road the project area is about 30 kilometres north of Pine Creek, which is situated on the Stuart Highway approximately 180 kilometres south-east of Darwin.

1.3 TENEMENT STATUS AND LAND TENURE

The project area is on Pastoral Lease PPL1111, portion no. 00695 (Ban Ban Springs Station) held by Britz Rentals Australia and Pastoral Lease PL815, portion no. 01630 (Mary River West Station) held by Equest Pty Ltd. NT Land Corporation owns the former rail spur line corridor which might be used for the haul road.

Except for the haul route, the proposed project area is within Mineral Lease Applications (MLAs) 24727, 25087, 25088, 25152, 25396 and 25529 which are held by Territory Iron Limited (Figure 2). They cover a portion of Exploration Licences 9999, 10137, 22270 and 22856, for which Territory Iron holds iron ore rights. Figures 1 to 4 show location of the MLAs at regional and local scales.

1.4 EXISTING LAND USE

Mining has been an important land use in the Pine Creek region since the 1870s. The project area was an iron ore mine between 1967 and 1974. The project area forms part of pastoral leases used for cattle breeding and grazing and tourism. The project area itself is not currently used for pastoral reasons. The water dam remaining from previous iron ore mining on the site is occasionally used for recreation including water skiing.

1.5 HISTORY OF MINING

Iron ore mining began at Frances Creek in 1967 and ended after Cyclone Tracy struck in 1974. Annual production was about 800,000 tonnes, most of which was lump product. A total of 7.98 million tonnes of ore grading at 59% iron was produced up to 1974.

Problems with the rail line, increasing freight costs and poor market conditions led to the mine becoming unprofitable, and a provisional liquidator was appointed in July 1974. Hopes of continuing the mine operations were wiped out when Cyclone Tracy destroyed iron ore port facilities in Darwin. The plant and the houses and buildings of Frances Creek town site were sold off by public auction in 1977.

An estimated at least two million tonnes of iron ore remained at Frances Creek when the mine closed, but economics didn't allow it to be mined at the time. The Alice Springs-Darwin Railway, improved technology, stronger iron ore markets and additional exploration have made it an attractive prospect for mining again.

2. PER OBJECTIVES, STRUCTURE AND LEGISLATIVE REQUIREMENTS

2.1 PER OBJECTIVES

Objectives of the PER are to:

- Provide all interested stakeholders, including government, with concise and comprehensive information about design, construction and operation of the proposed mining operation.
- Provide information to enable understanding and assessment of the proposal's scope and environmental implication.
- Assess the environment of the project area and surrounding region.
- Identify all potential environmental and social impacts of the project.
- Incorporate stakeholder concerns and suggestions into project design and management.
- Outline management strategies to avoid or minimise potentially adverse impacts.
- Secure Northern Territory and Commonwealth Government environmental approvals for the project in accordance with the Northern Territory *Environmental Assessment Act 1982* and Federal *Environment Protection and Biodiversity Conservation Act 1999*.

2.2 PER SCOPE AND STRUCTURE

Information outlined in the PER document applies to the design, construction and operation of the Frances Creek Iron Ore Mine including haul roads and rail loading facility.

The geographical extent of the PER is limited to areas potentially influenced by the project.

The PER is structured into a stand-alone Executive Summary (this document) and 2 main volumes with Volume 1 containing the main text of the PER and Volume 2 containing supporting appendices. The PER has been prepared to conform with the Guidelines for the Preparation of a Public Environmental Report, Frances Creek Iron Ore Mine (EPA Northern Territory 2006).

2.3 LEGISLATIVE CONSENT AND LICENSING REQUIREMENTS

Commonwealth

The proposed Frances Creek Project has been deemed a Controlled Action under Part 9 of the (Federal Government) *EPBC Act 1999* and requires approval under the Act.

Bilateral Agreement

Approval for the proposed Frances Creek project will be assessed under the Bilateral Agreement signed by the Australian and Northern Territory Governments under Section 45 of the *EPBC Act 1999*. This provides for accreditation of certain state environmental assessment

processes, including assessment at PER level under the Northern Territory *Environmental Assessment Act 1994*.

Under terms of the Bilateral Agreement, the Federal Government has had input into specifying the guidelines for the preparation of this PER and a separate section (Section 9) of the PER addresses issues subject to the *EPBC Act 1999*. The Northern Territory Government will provide copies of assessment documentation to the Federal Government at each stage of the approval process. The Federal Government will decide on approval of the project when the Northern Territory approval process is complete.

Northern Territory

The Environmental Assessment Act 1982 and *Environmental Assessment Administrative Procedures 1984*, which accompanies the Act, form the basis for the Northern Territory's environmental impact assessment process. Under this Act the Minister for Environment and Heritage has determined that the Frances Creek Project is to be assessed at the level of Public Environmental Report (PER). The PER will be exhibited for public review and comments for four weeks. During this period, the PER will be circulated to advisory bodies for comment in relation to their areas of expertise and responsibility.

Following the public review period, Territory Iron will receive a copy of submissions and be allowed to prepare and submit an addendum to the PER addressing the submissions. The Environmental Protection Agency of the Department of Natural Resources, Environment and the Arts (NRETA) will then prepare an assessment report and make recommendations to the Minister for Environment and Heritage about project approval. The report takes into account issues raised by advisory bodies, the public and the Territory Iron's response to the issues. The Minister for Environment and Heritage considers this report and makes recommendations about approval of the Frances Creek project. These recommendations may be incorporated in the environmental assessment process, in lease or license conditions, or relevant management procedures.

The Frances Creek Project will also be subject to other relevant Northern Territory legislation. In particular Northern Territory mining operations are regulated by the *Mining Management Act 2001*, administered by the Department of Primary Industries, Fisheries and Mines (DPIFM). Under this Act, Territory Iron must submit a Mining Management Plan (MMP) and apply for authorisation to carry out mining before mining can start. The MMP is the principal administrative document for the mine and can incorporate environmental conditions generated by the environmental approval process. It will also incorporate an Environmental Management Plan (EMP).

3. DESCRIPTION OF THE PROPOSED DEVELOPMENT

3.1 OVERALL MINING DESCRIPTION

The proposed mine will require

- Cutbacks of three existing open pits and development of two new open mining pits in the Frances Creek mineral lease tenements.
- Construction of waste rock stockpiles next to the pits.
- Installation of a small crushing and screening plant, workshops and offices.
- Upgrading of existing roads and tracks for ore haulage.
- Construction of a new rail siding and stockpile area next to the Alice Springs to Darwin Railway.
- Ore will be extracted by drilling and blasting, then transported by haul truck or road train to the plant area to be crushed, screened and stockpiled. Dewatering of one pit will be required.
- Road trains will transport product from the product stockpiles to a stockpile area next to the Alice Springs-Darwin Railway, then loading onto rail carriages and transport by rail to Darwin Port for export.

A more detailed explanation of the sequential mining process is described below:

1. **Remove Vegetation:** Vegetation cleared for mining at the site will, where practicable, be stockpiled for use in later rehabilitation.
2. **Remove and Stockpile Topsoil:** The top 100 millimetres of topsoil will be removed using scrapers or other efficient earth moving machinery and placed in low stockpiles for later re-use.
3. **Remove and Place Overburden:** Typically the overburden depth varies between one and 40 metres at a stripping ratio of about four cubic metres of overburden for every cubic metre of ore removed. Overburden will be stockpiled next to the pits.
4. **Dewatering:** The Helene 6/7 Pit will be dewatered by pumping to allow mining below the water table. Water removed will be used for dust suppression. During the wet season, excess water may overflow after dilution and settling to Frances Creek.
5. **Mining and Haulage:** A hydraulic excavator and a fleet of dump trucks will be used for extraction. Blasting will fracture the ore and waste rock sufficiently to allow excavation. Ore bearing material will be loaded onto haulage trucks and taken to a run of mine (ROM) stockpile close to the processing plant. Several ore bodies will be mined simultaneously to facilitate blending of the material. The mine is expected to produce up to 1,500,000 tonnes of product a year.
6. **Processing:** The iron ore will be transported to a small plant next to the Helene 6/7 Pit where it will be crushed and screened. No chemicals will be used in the process.
7. **Transport:** Road trains will transport the ore from the plant product stockpiles to a rail loading stockpile area at Roney Siding. Front-end loaders will load the ore onto trains for rail transport to Darwin Port.

8. **Disposal of Waste:** Waste rock will be deposited in purpose-built stockpiles next to each pit. Waste rock stockpiles will be shaped to blend with the topography and will be topsoiled and revegetated. Waste rock stockpiles will be low in height with gentle slopes to facilitate controlled water shedding. Where practicable, stockpiles locations will be selected so that they do not cross drainage lines. Opportunities to backfill pits with waste rock rather than increasing size of out of pit stockpiles will be explored and will occur where practicable.
9. **Rehabilitation:** Progressive rehabilitation occurs. Overburden and topsoil will be progressively replaced over completed waste rock stockpiles and seeded or planted with local native species. Areas such as the plant and stockpile area, which cannot be rehabilitated during operations, will be rehabilitated at closure.

3.2 PROJECT RESOURCES

The initial mineral leases are estimated to contain approximately 3.5 million tonnes of ore at a grade of 61.1% iron. This should support production of an average 1,000,000 tonnes of ore per year for three years. Production is anticipated to increase to a maximum rate of 1,500,000 tonnes a year.

3.3 EXISTING SITE LAYOUT

The project area is located along the Frances Creek valley. Infrastructure present and the condition of the site is shown in 1999 aerial photographs (Figures 3 and 4). The full extent of former mining operations is shown in Figure 5, a photograph dating from 1975, immediately after the previous mine closed.

Two large water storage dams, a tailings storage facility, the plant site and remnant stockpiles from previous iron ore mining at Frances Creek are at the south western end of the project area. Ochre Hill is located five kilometres to the north of the existing haul road, and is currently accessed by seven kilometres of narrow track and a ford across Frances Creek (Figure 4). Frances Creek Road, a well constructed dirt road, links the project area with the public Mt Wells Road, 12 kilometres to the south (Figure 2), and forms the haul road between the existing pits and the stockpile area.

3.4 MINING SCHEDULE

Mining will be in a staged process from five pits, starting in late 2006 with extensions of the historic Helene 6/7, Helene 5 and Thelma Rosemary open pits in the south. In April 2007, work will begin on a new pit at Ochre Hill in the north of MLA 24727 and a new pit at Jasmine East, at the eastern extremity of MLA 24727.

3.5 PIT AND WASTE ROCK STOCKPILE CHARACTERISTICS

Proposed pit locations are shown in Figures 3 and 4. Plan and cross-sectional views of the proposed pits are given in Appendix 3 of Volume 1 of the PER. Dimensions of the pits are summarised in Table 1. All pits are located at or near the top of hills.

Table 1: Proposed Pit Dimensions

	Helene 5	Helene 6/7	Jasmine E	Ochre Hill	Thelma Rosemary
Length (m)	770	280	230	560	650
Width (m)	170	300	180	120	220
Area (ha)	10.6	8.7	2.6	6.4	10.3
Maximum Pit Depth (m)	70	100	52	55	72
Pit Base RL (m AHD)	160	130	200	152.5	185

Waste rock and overburden will be deposited in purpose built waste rock stockpiles next to the pits (Figure 4). Limited potential exists to backfill pits with waste rock. This will occur where it is economically feasible i.e. without double handling.

An estimated 3,000,000 tonnes of overburden and waste rock will need to be moved annually. It is unlikely that more than 10% of this will be backfilled into pits.

Dimensions of the proposed waste rock stockpiles are shown in Table 2.

Table 2: Proposed Waste Rock Stockpile Dimensions

	Helene 5	Helene 6/7	Jasmine East 1 & 2	Ochre Hill	Thelma Rosemary
Length (m)	620	760	290 & 320	620	970
Width (m)	400	480	130 & 210	310	340
Area (ha)	20.1	22.9	2.5 & 3.8	13.6	19.39
Height (m)	20 (max)	32 (max)	28 & 75 (max)	45 (max)	40 (max)
Volume (m ³)	2,992,629	1,512,298	661,771	1,242,388	2,487,527

Except than the Helene 5 waste rock stockpile, all waste rock stockpiles will be within 200 metres of associated pits. Locations have been chosen to minimise haulage distances and avoid the need to divert water courses.

The Thelma Rosemary waste rock stockpile has been positioned to bury the existing Thelma 2 waste rock stockpile which still has little or no vegetation 30 years after closure. This will rehabilitate this historic disturbance. A small upstream surface water catchment will need to be diverted around this stockpile.

The Helene 5 waste rock stockpile will be constructed over the former stockpile area and tailings storage facility. This site has been chosen to minimise clearing of native vegetation and permit

improved rehabilitation of a previously disturbed area. The stockpile has been located to retain the existing surface water flow path over the tailings surface to the south of the stockpile.

3.6 ORE PROCESSING

Ore processing will initially involve only mechanical crushing and dry screening. The processing plant will comprise a mobile self-powered crushing and screening plant designed to achieve an average throughput of 450 tonnes an hour. It will consist of three main units and will require an area of about 60 by 40 metres to operate within. Two-wheel loaders will load raw material into the plant and take processed products away.

The plant will produce two products, Fine (less than 6.3 millimetres) ore, and Lump (greater than 6.3 millimetre ore). No chemicals will be used in the processing. The plant will have diesel engines to power itself and will not require any external power sources.

Wet screening will not occur in at least the first year of mine operation.

3.7 WATER MANAGEMENT

3.7.1 Water Requirements

Water requirements for the proposed operations are limited to dust control, equipment wash down and personal use. Dust control will use most water. It includes spraying of roads, stockpiles, loading operations and crushing and screening plant.

3.7.2 Water Sources and Dewatering

The Helene 6/7 Pit has a groundwater inflow of about 15 litres per second and will need dewatering to allow mining. Water pumped from Helene 6/7 Pit will be directed to the existing Helene 11 Dam. The Helene 11 Dam will supply most water for project needs. Helene 11 Dam also receives runoff from a natural catchment and overflow from the larger Helene 9 Dam. During the wet season, in normal rainfall conditions, it will overflow to Frances Creek Main Dam, causing release of diluted and settled water from Helene 6/7 to the Main Dam and ultimately Frances Creek. Discharge would only occur only during natural occasions of high stream flow. Helene 11 Dam is expected to meet all project water requirements, but if supplementary water is required for any reason, it can be sourced from the adjacent Helene 9 Dam. Potable water supplies will be trucked in from Pine Creek.

Other than Helene 6/7 Pit, the other pits will require dewatering only to manage accumulation of rainfall in the pits. Excess rainwater accumulated in:

- Helene 5 will be pumped into Helene 11 Dam, as necessary, along with Helene 6/7 dewatering.
- Thelma Rosemary Pit will be pumped to Thelma 2 Pit.
- Jasmine East Pit will be pumped to Jasmine Central Pit.

Ochre Hill Pit will be discharged via a settling pond to the adjacent tributary of Maude Creek. Discharges to the Maude Creek tributary will only occur during natural stream flow to ensure adequate dilution.

3.7.3 Water Diversion

All proposed pits and the Ochre Hill waste rock stockpile are on hilltops and will not require any diversion of surface water. The Helene 6/7 and Thelma Rosemary waste rock stockpiles (Appendix 3) partially fill minor valleys with ephemeral water courses. These water courses will be diverted around the stockpiles. The Jasmine East waste rock stockpiles fill small steep valleys and will not require any diversion of water courses.

3.8 TRANSPORT

3.8.1 General Access to Site

Existing roads from Pine Creek provide general access to the mine site, as shown in Figure 2. Road access to the site from Pine Creek will be about 23 kilometres via the public roads Kakadu Highway (three kilometres) and Mt Wells Road (eight kilometres) followed by 10.5 kilometres of the private Frances Creek Road.

Estimated maximum daily volumes of traffic which the mine is likely to generate on the site access route:

- Three return trips by a small to medium sized bus to transport workers.
- 10 return trips by 4WD vehicles.
- Two return trips by semi-trailer or road train.

3.8.2 Iron Ore Road Haulage

Triple or quadruple road trains will transport ore to a stockpile and rail loading facility to be built at a new railway siding (Roney Siding) on the Alice Springs-Darwin Railway (Figure 2). From there it will be loaded onto rail wagons which will travel to Darwin for unloading at the Port of Darwin. A minimum of 20 daily road train movements at first will rise to at least 40 daily road train movements along the haul road, in each direction, once full production is achieved.

Territory Iron will use one of two alternative routes for haulage. The two routes are described below. A final choice of route option will be made before construction and only the chosen route utilised.

Route 1 will follow a dedicated iron ore haul road to be built along alignment of the old railway spur line from the previous iron ore mining operations. Roney Siding will be 14.2 kilometres from the mine site by this route. NT Land Corporation owns the rail corridor which crosses Mary River West Pastoral Lease. An agreement will be negotiated with the tenure holders to allow construction of the haul road before road construction begins. The 12.6 kilometres of haul road in the former railway corridor will be established by modifying

the remnant spur line formation. The cuttings will be widened slightly and a running surface re-established using gravel from the formation or local sources.

On raised sections, across streams and low lying areas between hills, the top of the formation will be lowered to increase its width to a minimum of five metres. Several passing loops will be built to permit the empty returning vehicle to move off the haul road and park or travel along the passing loop when a loaded truck approaches. Territory Iron expects that no more than two road trains will operate at any one time so the frequency of passing will be low.

A cross roads intersection is needed to allow haul trucks to cross from the north to the south side of Mt Wells Road. This will be about 1.2 kilometres from the railway crossing.

A 0.6 kilometre section of new haul road will link the old railway alignment to the Mt Wells Road intersection, and a further 1.6 kilometres of new haul road will link the Mt Wells Road intersection to Roney Siding. The new road will be typically seven metres wide (wider on curves) with an open table drain on one side.

Route 2 would use the existing Frances Creek Road for 9.7 kilometres to Mt Wells Road, then the existing Mt Wells public road west for seven kilometres to where Route 1 crosses Mt Wells Road. A new T-intersection at this site will allow trucks to turn off onto a new 1.6-kilometre section of haul road to link Mt Wells Road to Roney Siding as for Route 1.

If Route 2 is adopted, Territory Iron will complete construction work on Mt Wells Road to improve intersections and watercourse crossings and improve sight lines. Signs erected on the Mt Wells Road will warn about road trains entering, leaving and travelling along the haul road.

3.9 PRODUCT LOADING AND EXPORT

Stockpiles at Roney Siding will store Fine and Lump ore product separately before loading on trains for transport to Darwin for export. A 2.4 hectare area will be cleared for the stockpile area at Roney Siding.

Ore will be unloaded by side tipping from road trains. A front-end loader will load material from stockpiles directly into rail wagons.

FreightLink will own and operate rail haulage from Roney Siding to the Port of Darwin. Each train will have up to 60 rail wagons capable of carrying about 70 tonnes per wagon, giving a total train load of 4,200 tonnes. Fewer carriages will be used before full production.

Trains are expected to run daily (365 return trips per year). Trains will be unloaded at the bottom dump bulk unloading facility at Darwin Port and the ore transferred to stockpiles and later loaded onto ships using port facilities.

3.10 INFRASTRUCTURE

The main office and workshop will be located next to Frances Creek Road at the mine site entrance. They will be on ground previously used for similar facilities during the previous mining operations at Frances Creek. Office and workshop infrastructure will include:

- Three transportable office buildings and a crib block, plus a male/female transportable ablution block, plumbed to an approved wastewater system.
- A first aid room including induction/safety training area.
- A potable water storage tank.
- A single bay workshop and vehicle wash down bay connected to an oil water separator.
- A diesel generator unit of around 75 kilowatt rated output.
- Hydrocarbon storage in self-bunded tanks complying with Australian Standard AS 1940:2004.

Other infrastructure away from the main office workshop area will comprise:

- Explosives magazine located at Jasmine Central Pit.
- A trench-type landfill waste disposal site for non-hazardous waste established on the Helene 6/7 waste rock stockpile.
- A mobile crib room and ablution unit to be moved between Ochre Hill, Thelma Rosemary and Jasmine East as required.
- Pumps and pipelines for water supply.

3.11 HAZARDOUS MATERIAL USE AND STORAGE

Hazardous substances to be used within the mining operation will be diesel, lubricants and explosives. No reagents will be used for ore processing. Diesel and lubricants will be stored in self-bunded tanks complying with Australian Standard AS 1940:2004. The storage, use and disposal of explosives will be in accordance with the *Explosives Act 1999*, the *Explosives Regulations 2003* and manufacturer's guidelines.

3.12 SITE PREPARATION AND CONSTRUCTION

Construction will begin with developing and upgrading the existing access road to the site, upgrading the haul route to the rail facility and installing the workshop, offices, power generation and fuel storage facilities. A level pad will be constructed to contain the mobile processing plant and stockpiles, and a stockpile area will be built at Roney Siding.

3.13 WORKFORCE

Construction will begin with a workforce of about 23 people, increasing to a permanent workforce of 73 people once start-up is complete. This will comprise 45 Territory Iron staff and 25 contractor staff.

3.14 PROJECT SCHEDULE

Territory Iron aims to begin mining as soon as all approvals have been granted. Construction is planned to start at Frances Creek in October 2006 assuming all approvals have been obtained. This will allow the planned first shipment of ore product to occur in March/April 2007.

4. PROJECT OBJECTIVES, ALTERNATIVES AND JUSTIFICATION

4.1 OBJECTIVES

Project objectives are to:

- Produce an iron ore product for export.
- Produce an iron ore product at a low cost while maintaining high levels of quality, safety and environmental protection.
- Ensure project flow-on benefits are shared with local communities and the Northern Territory as a whole.
- Conduct mining and processing operations in accordance with Territory Iron environmental and safety policies.

A copy of the Territory Iron Environmental Policy is in Appendix 2.

4.2 ALTERNATIVES CONSIDERED

The project described in this document is a result of careful consideration of the financial, environmental, safety, social and operations aspects associated with each component of the project.

Not proceeding with the project was rejected as an alternative as it would not satisfy Territory Iron's objective to produce iron ore products. This option would result in a loss of employment opportunities and economic benefit, particularly within local and regional communities.

Territory Iron's objective is to fully mine the economic resource. In the long term this will minimise the duration of impact and allow rehabilitation to begin as soon as possible. For this reason, partially mining the resource was rejected as an alternative.

There are few available options for mining methods and processing technology. Industry best-practice methods of year-round mining with conventional earth moving equipment and techniques will be adopted. Underground mining is not economically feasible for this sort of high volume resource, and campaign mining during the dry season would result in increased infrastructure costs, greater land requirement for stockpiling, and reduced social benefits through less secure employment. Processing ore by crushing and screening is extremely simple and there are no real alternative techniques available.

Locations for the open pits, process plant, waste rock stockpiles, site access road and other infrastructure shown in this document were selected after careful consideration of the environmental factors relevant to location of each component. The chosen location and project design has considered the existing disturbances from historical mining. Most infrastructure and site access roads will be located over areas previously disturbed by mining in order to minimise new disturbance.

Rail transport to Darwin for overseas shipping is the only economically-feasible option for ore transport. Several options are possible for transport from processing plant to the rail siding. The two proposed road routes maximise use of existing transport infrastructure and minimise impact on vegetation through clearing. The alternative option of constructing a spur line is attractive environmentally, but its high capital cost means it is not economically viable with the proved resources available for mining.

4.3 JUSTIFICATION AND BENEFITS

The project described in this document is a result of careful consideration of financial, environmental, safety, social and operations aspects associated with each component of the project.

Benefits anticipated from the project include:

- Providing direct employment for about 73 people during construction and operation, of which 28 will be contractors. Additional indirect employment is anticipated from supplying goods and services to the project.
- Spending more than 10 million dollars on construction and more than 65 million dollars per year operating the mine, including wages. Almost all this money will be spent in the Northern Territory.
- Contributing directly to Federal and territory economies through payment of company tax, payroll tax and royalties.
- Upgraded accommodation built in Pine Creek, which will have potential future use for tourism or other mining operations after mining finishes.
- Much fuller use of housing in Pine Creek (there are currently several houses unoccupied), and substantial increases in local purchasing (wet goods, groceries, food).
- Giving preference to engaging local businesses to provide goods and services to the project.
- Offering local industry opportunities to participate in construction of some facilities including: road access, site office and workshop facilities and clearing and grubbing of site.
- In the operations, locals (including the indigenous work force) may be offered positions as unskilled labourers or operators, if they are suitably trained. In addition, skilled electricians, plumbers, or carpenters based in Pine Creek will be called on an ad hoc basis for their services.
- Engaging the jobs and careers unit of the Northern Land Council to provide an indigenous employment and training service to the mine.
- Funding business mentoring to help establish indigenous business entities to provide contract services to the mine.

5. EXISTING BIO-PHYSICAL ENVIRONMENT

5.1 CLIMATE

Frances Creek has a tropical monsoonal climate with a pronounced wet season consisting of a hot, high rainfall and humid summer from November to March. Conditions are typically cooler and dry from May to September. Average rainfall in the region is 1,100 to 1,300 millimetres which falls mainly during the period between October and April. Evaporation at Pine Creek is estimated at 2,775 millimetres per year (Bureau of Meteorology, 2003), more than double the average rainfall.

Air temperatures are relatively high and consistent from year to year. The mean monthly temperature for Pine Creek ranges from a minimum of 10 to 27 degrees Celsius to a maximum 20 to 41 degrees Celsius. The lowest recorded overnight temperatures are below five degrees Celsius. Humidity measured at Pine Creek averaged 49% in September 2004 and 79% in February 2005 (Bureau of Meteorology, 2006).

5.2 GEOLOGY

The Frances Creek project area is located on the Pine Creek Orogen, a Lower Proterozoic sequence of sediments. Iron deposits in the project area occur as semi-continuous lenses. They are haematitic ironstones with isoclinal folds in the lower member of the Wildman Siltstone. The deposits crop out as prominent, discontinuous ironstone ridges up to 50 metres high over a strike length of 15 kilometres (Australian Groundwater Technologies, 2006). The largest bodies of ore occur from south to north being Helene, Thelma 2, Ochre Hill and Saddle deposits (BMR, 1987). The ironstone ridges thicken within fold hinges at the Helene pits and are continued within carbonaceous phyllite and siltstone (Australian Groundwater Technologies, 2006).

5.3 WASTE ROCK GEOCHEMICAL CHARACTERISATION

Territory Iron commissioned MBS Environmental in January 2006 to complete geochemical analysis of waste rock likely to be produced by mining operations. The complete report is contained in Appendix 4 and findings are summarised below.

Ten waste rock samples were taken for geochemical characterisation. Sampling covered the Ochre Hill, Helene 5, Helen 6/7, Jasmine East, Thelma Pit 2 and Thelma Rosemary deposits. No samples contained more than 0.2% total sulphur. All samples have a net acid producing potential of zero or less than zero and all are Non Acid Forming (NAF).

A Thelma 2 Pit waste rock sample had the highest sulphur value (0.103% S) with all sulphur already oxidised to sulphuric acid and a pH leachate value of 4.9. Adjacent pit water has a pH value of 3.5. At the Thelma 2 pit, previous mining has exposed a large amount of highly carbonaceous footwall material which is now below water level in the pit. This has resulted in chalcophile metals being leached and retained in solution in pit water. All sulphur in footwall waste rock has totally oxidised and current acidity in pit waters is dominated by organic acids

from plant decomposition. The current values should be stable after 32 years and no further acidification is considered likely.

Final open pit voids may develop low pH water within the aluminium hydroxy-sulphate buffer zone of pH 3.2 to 4.9 over a long time frame, but most acidity will be sourced from decomposing vegetation, not sulphides.

As part of geochemical characterisation studies, analysis determined, based on waste rock geochemical characteristics, the potential for trace element pollution of local ground waters as a result of long-term waste rock disposal and interaction of groundwater with final pits. Waste rock samples were subject to water and acid leach tests. Review of results indicates that:

- Helene and Ochre Hill areas will produce alkaline waste rock with negligible toxicants.
- Traces of arsenic, cadmium, nickel and molybdenum may leach from Ochre Hill waste rock, but only very slight dilution plus oxygenation will be needed to reduce concentrations for all of these elements to below fresh water trigger values.
- In the Jasmine–Thelma–Rosemary area, small amounts of cobalt, copper, lead, nickel, thallium and zinc will leach from waste rock over time, but similar to the Ochre Hill area, only slight dilution plus oxygenation will be required to reduce all leachate results to below fresh water trigger values.

The proposed mining areas are immediately adjacent to and in places coincident with a regional stratiform zone of uranium enhancement in the Wildman Siltstone. Uranium and thorium are present in the ore and waste rock, but soluble levels are extremely low.

5.4 LANDFORM AND SOILS

Land systems for the Katherine–Darwin Region have been described and mapped by Christian and Stewart (1953). The Frances Creek project area is located within the Brocks Creek Ridge Land System of the Katherine–Darwin Region (Christian and Stewart, 1953). A small section in the south-eastern area of the mineral lease is the Cullen Land System (Christian and Stewart 1953), however no mining activity is proposed in this granitic area. The two land systems form part of the broader geomorphological unit referred to as the Elevated Backbone Country.

Landforms consist of rocky north–south ridges and hills with slopes between 40 and 60 degrees moderating to gentle crests. Smaller convex hills, small alluvial flats and channels incised through sandy or loamy materials are also associated with this land system. The country is dissected by many watercourses and erosion is active (Reilly *et al*, 2006).

Due to the active erosional process at work in the Brocks Creek Ridge Land System there is little to no accumulation of soil on the steep slopes. Soils present are typically very gravelly sandy loams and skeletal soils (Christian and Stewart, 1953).

Soils of the steeper topography of the Cullen Land System are typically very gritty, sandy skeletal soils while the gently undulating hills have soils comprised of granitic sandy yellow podsollic soils (Reilly *et al*. 2006).

Reilly *et al.* (2005; 2006) describe six land unit groups that occur across the lease area. These are:

- Brocks Creek Ridge Land System:
 - Ridge Crests and Slopes land unit.
 - Low Hills land unit.
 - Riparian land unit.
 - Small Alluvial Flats land unit.
- Cullen Land System
 - Low Undulating Plains land unit.
 - Granite Hills land unit.

5.5 GROUNDWATER

Australian Groundwater Technologies completed a groundwater study of the project area in February 2006. A full copy of the report is provided in Appendix 5.

5.5.1 Regional

The complex stratigraphic and structural geology of the Pine Creek region results in a rather complex hydrogeological environment. Aquifer characteristics show extreme variation according to lithology, tectonic hiatus, and geomorphological history. In terms of groundwater flow systems, the Frances Creek area is believed to contain many “local scale” flow systems driven by topography and recharge/discharge processes.

AGT could not determine regional groundwater flow directions owing to the paucity of standing water level information as bores in the region are clustered in terrain whose elevation is highly variable. Groundwater velocities also cannot be determined with any credibility.

Regionally, groundwater is typically of low salinity with high levels of bicarbonate and a pH that is slightly acid to slightly alkaline.

5.5.2 Project Area

Formations of interest in the Frances Creek area constitute fractured rock aquifers. They are the Wildman Siltstone, said by Dames and Moore (1989) to be low yielding (< 0.5 litres per second), and possibly the Mundogie Sandstone (< five litres per second) and Masson Formation (< 0.5 litres per second).

Around the Frances Creek mine site, brittle rocks are highly fractured and weathered producing much greater bore yields than suggested above. Virtually all of the higher yielding bores are in the previous mineral processing/stockpile/tailings area approximately 200 to 500 metres west of the ore body trend formerly exploited in open pits at Helene 4, 5, and 6/7.

Depth to water (SWL) historical data is available for five bores in the township area and seven bores in the mine site. Review of monitoring data from the 1960's and 1970's, data collected during recent exploration activities and a site visit made by AGT in January 2006 suggests that average depth to water in the township area is about 24.66 metres and 28.95 metres for the mine area. Large differences in standing water level results between records from the 1960s and 1970s to current results was observed. It seems likely that groundwater levels could have recovered to within 10 to 15 metres of the surface since the site was vacated in 1976.

5.5.3 Water Quality

Groundwater quality data from historic bores at the town and mine sites were extracted from the NT database. The data showed that the water is of good quality with a maximum TDS of 310 milligrams per litre, high bicarbonate content and generally slightly alkaline pH (AGT, 2006). Groundwater beneath the town and mine sites may be broadly characterised as a calcium-bicarbonate type with relatively high hardness, but suitable for most purposes including drinking water for both humans and livestock.

Pit water quality is considered to reflect groundwater plus varying amounts of rainwater accumulated in deeper pits that result in a low salinity signature. Samples were taken during site visit in January 2006. Review of analytical results showed that:

- All samples have low TDS.
- All but one has pH values greater than six.
- All but one has generally low abundances of arsenic, cadmium, copper, lead and zinc.
- The one exception is a sample collected from Thelma 2 Pit in November 2005 which recorded a pH of 3.5. Copper and zinc exceed the ANZECC (2000) guideline values in this sample, but the other heavy metals are within acceptable limits.

The low salinity of pit waters suggests that the pits act as collectors and groundwater recharge points (groundwater sources) during the wet season and evaporative discharges (groundwater sinks) during the dry with very little through flow.

The native groundwater has low TDS, only three to four times that of the average pit water.

5.5.4 Beneficial Uses

The sole town water supply in the region is Pine Creek, 25 kilometres south of Frances Creek.

Agriculture in the vicinity consists of rangeland grazing of cattle on the Mary River West and Ban Ban Springs pastoral leases and as such is low intensity with scattered watering points; dams, soaks and bores.

All other recorded users are historical (abandoned mines). There are plans to reopen the Union Reef gold operation, 15 kilometres south south-west of Frances Creek, in 2006; the 'Burnside Project'; and to open the Mount Porter Mine four kilometres south-west of Frances Creek.

5.6 SURFACE WATER

MBS Environmental completed a surface water study of the project area in July 2006 (MBS July 2006). This report is attached in full in Appendix 6.

5.6.1 Regional Catchment Description

The Frances Creek project area is located in the headwaters of the upper Mary River catchment (Figure 1). The upper Mary River catchment is characterised by channel flow, while the lower catchment (downstream of the McKinlay River) is dominated by sheet flow, with large areas of floodplain seasonally inundated, during the wet season, receding to a series of large pools of permanent water “Billabongs” in the dry season.

Frances Creek is located about 20 kilometres north of the southern boundary of the Mary River catchment. The discharge point of Mary River to the ocean is 150 kilometres north of Frances Creek. The major drainage divide within the project area is between the Frances Creek and Maude Creek catchments. Frances Creek has a catchment area of 158 square kilometres. Maude Creek is another tributary of the Mary River, located about 20 kilometres north of and parallel to Frances Creek, with a catchment area of 223 square kilometres (Figure 1).

5.6.2 Project Area Catchments

Most of the Frances Creek project area lies in the catchment of Frances Creek. The northern portion drains east into the Mary River via Maude Creek. Part of the haul route drains into the Mary River via Nelly Creek and some drains west into the McKinlay River either directly or via Watts Creek.

Three large dams exist on the upper part of Frances Creek. These were constructed for the previous Frances Creek mining operation and were completed in about 1971 (Barrie, 1999). The dam walls consist of an upper dam wall, which creates the Helene 9 Dam and an upstream embankment for the TSF, a lower TSF dam wall, creating the Helene 11 Dam which would have been a water recovery dam for the TSF and the lower dam wall which creates Frances Creek Main Dam (Figure 6). The maximum depth of all dams is about six to eight metres, and they have catchment areas of 1.95 square kilometres (Helene 9), 2.55 square kilometres (Helene 11) and 2.40 square kilometres (Frances Creek Main). Approximate volumetric capacity is 1,300 megalitres for the main Frances Creek dam, 250 megalitres for the Helene 11 Dam and 450 megalitres for the Helene 9 Dam.

There are also two much smaller dams. Helene 6 Dam is created by the TSF blocking a small tributary, and Helene 4 Dam created by the main haul road damming a catchment to the east. These dams have catchment areas less than one square kilometre and are likely to dry out during most dry seasons.

5.6.3 Average and Flood Flows

Watercourses in the project area are ephemeral and dry up during the dry season, but have regular flows during the wet season. Several seasonal and some semi-permanent natural waterholes exist in the Frances Creek project area. This is due to shallow groundwater levels in topographically low areas and the locally permeable nature of the bedrock (AGT, 2006).

Average flows for catchments in the project area were estimated based on flow data collected from government flow gauging stations at Frances Creek (Station G8180167), Harriet Creek (Station G8180252) and McKinlay River (Station G8180069) (MBS, July 2006). The estimated flows indicate that the average annual stream flow into the dams on site is over half the storage capacity, and dams are likely to overflow most years.

5.6.4 Regional Water Quality

The report “*Water Quality of the Rivers and Streams of the Mary River Catchment (N.T.)* (Schultz *et al*, 2002) provides a summary of regional water quality in Mary River catchment. The catchment in general has slightly low pH compared with the relevant ANZECC (2000) default trigger values for protection of aquatic ecosystems (referred to as ANZECC trigger values in this report). The electrical conductivity is towards the upper end of the ANZECC trigger value range. The higher conductivity is likely to be due to different geology (Schultz *et al*, 2002). Nutrients (nitrogen and phosphorous) are low, generally below ANZECC (2000) trigger values. Turbidity is within the range of ANZECC (2000) trigger values.

Median aluminium concentration in the Mary River catchment as analysed in (Schultz *et al*, 2002) is above the ANZECC trigger value. The median concentrations of all other metals analysed are below trigger values, but at least one sample exceeded the ANZECC trigger values for each of cadmium, copper, nickel and zinc. Analysis focusing on upper tributaries in the Pine Creek Geosyncline indicates significant concentrations of metals in runoff from these areas, which include the Frances Creek catchment.

The widespread high concentrations of aluminium suggest that biota in the area has had an extended period to adapt to the high aluminium concentrations in the area (Schultz *et al* 2002). The ANZECC trigger values are therefore likely to be too conservative to apply to protection of ecosystems in the Mary River catchment.

5.6.5 Project Area Water Quality

Surface water samples were taken in the project area during April, November, and December 2005. The Frances Creek Waste Characterisation Study (MBS, 2006) includes a detailed analysis of all surface water samples in the project area.

Analysis of samples indicates that water quality in the project area is generally good, but with significantly enhanced metal content in some areas. All water is fresh, with some higher electrical conductivity observed in areas subject to evaporation over the dry season. All samples were taken early in the wet season (November to December 2005) with the exception of Helene 9 Dam (April - early dry season) and the Frances Creek Dam (July - dry season). It is expected that water during the wet season will more closely resemble rainwater, with lower electrical conductivity. The highest concentrations of metals generally occurred in upper catchments without mining disturbances, and concentrations are lower in samples

downstream. Aluminium is elevated in all samples, as it is in the upper Mary River catchment generally (Schultz *et al*, 2002). The highest recorded levels of metals were in a sample taken from an undisturbed mineralised catchment in a Territory Iron exploration area 7.5 kilometres north of the proposed project area.

The high levels of some metals in natural runoff in the area means it will be important to monitor flows upstream of operations to distinguish natural levels of metals from any influence of mining.

5.6.6 Downstream Water Users

Three main beneficial uses of surface water in the Mary River catchment have been declared under Beneficial Uses legislation under the *NT Water Act 1992*. These are:

- Cultural use (including aesthetic and recreational).
- Environmental use (the maintenance of healthy aquatic ecosystems).
- Riparian use (public rights to extract water for domestic/stock purposes).

These uses are the basis for waste discharge licences and water quality planning – potential waste discharge or water extraction which detrimentally impacts on these Beneficial Uses will not be permitted under the *Water Act*.

There are no townships within the Mary River catchment. Some recreational use has been made of water on the main Frances Creek Dam in the project area, primarily in the form of water skiing and swimming. The main uses in the project area would be environmental. The area is not currently used for grazing, but as it is part of Ban Ban Springs pastoral lease there is potential for riparian use for stock purposes.

The Mary River forms a portion of the boundary of Kakadu National Park where Frances Creek joins it, about 20 kilometres downstream of the project area (Figure 2). The Kakadu National Park diverges from the Mary River about 40 kilometres downstream. Mary River does not flow into the park, so there is minimal use of water in Kakadu. Mary River National Park covers most of the Mary River downstream of Kakadu. Recreation and environmental uses are significant in Mary River National Park.

5.7 VEGETATION AND FLORA

The Frances Creek project area lies in the Pine Creek Bioregion of the Northern Territory. This bioregion is dominated by tall open eucalypt forests of *Eucalyptus miniata* and *E. tetradonta* and mixed *Eucalyptus* woodlands. Vegetation mapping of the Northern Territory that was undertaken by Wilson *et al.* (1990) identifies the vegetation of the Frances Creek project area as being *Eucalyptus tintinana* woodland with *Corymbia dicromophloia* and *Eucalyptus miniata* over a tall *Sorghum* grassland.

An environmental survey of the project area undertaken in November 2005 with a follow up survey undertaken in May 2006 identified the following six land units:

- Ridge Crests and Slopes.

- Low Hills.
- Riparian.
- Small Alluvial Flats.
- Granite Hills.
- Low Undulating Hills.

Vegetation of these land units was typically open eucalypt woodland over grassland with dominant or co-dominant tree species including *Eucalyptus tetradonta*, *E. minata*, *E. tinnitans* and *Corymbia dichromophloia* and dominant grasses including *Sorghum* species.

One population of *Cycas armstrongii* was located about 50 metres from the Ochre Hill haul road alignment. This species is listed as Vulnerable under the Northern Territory *Territory Parks and Wildlife Conservation Act 2000*. No other flora species listed under Federal or Territory Acts were recorded during the survey.

No threatened ecological communities (TECs) were recorded from the project area during the November 2005 and May 2006 surveys. No TECs are known to occur in the region.

Vegetation and flora of the Frances Creek project area is generally common and widespread throughout the region. The project area does not represent an area of significant endemism.

Due to the previous mining activities at the Frances Creek project area and current mining operations taking place at nearby locations vegetation of the project areas southern portion is in a degraded condition. Approximately 40% of the project area has been previously disturbed.

The November 2005 and May 2006 surveys recorded a number of weeds in the project area. None of these are a Class A declared weed under the Northern Territory *Weeds Management Act 2001*, although several are Class B weeds.

5.8 FAUNA

An environmental survey of the project area was conducted during November 2005 with a follow up survey in May 2006 recorded a total of 149 fauna species including 30 mammals, 83 birds, 22 reptiles, six amphibians, eight fish and one crustacean. Due to the short duration of the surveys, this is not considered to represent the full suite of species expected to be present. Supplementing the information from the November 2005 and May 2006 surveys with records from surveys completed in nearby areas presents a more comprehensive set of fauna species for the area.

A number of fauna species of conservation significance were recorded during the November 2005 and May 2006 surveys. Surveys in nearby areas have recorded additional fauna species of conservation significance. These species together with details of their threat status are shown in Table 3.

Table 3: Fauna Species of Conservation Significance Recorded and Potentially Occurring Within Frances Creek Area

Fauna Species	Recorded in Site Specific or Nearby Surveys	NT Status	Federal Status	IUCN Status
Mammals				
Bare-rumped Sheath-tail Bat (<i>Saccolaimus saccolaimus nudicuniatius</i>)		Data Deficient	Critically Endangered	Least Concern
Northern Quoll (<i>Dasyurus hallucatus</i>)	K, N	Vulnerable	Endangered	Near Threatened
Calaby's Pebble-mound Mouse (<i>Pseudomys calabyi</i>)	S, K, N	Near Threatened		Rare
Nabarlek, Little Rock Wallaby (<i>Petrogale concinna</i>)	K	Near Threatened		Near Threatened
Brush-tailed Phascogale (<i>Phascogale tapoatafa</i>)	K	Vulnerable		Near Threatened
White-striped Sheath-tail Bat Arnhem Sheath-tail Bat (<i>Taphozous kapalgensis</i>)	S, N	Near Threatened		Vulnerable
Ghost Bat (<i>Macroderma gigas</i>)	S, K, N	Near Threatened		Vulnerable
Lesser Wart-nosed Horseshoe Bat (<i>Hipposideros stenotis</i>)	K	Near Threatened		Near Threatened
Western Chestnut Mouse (<i>Pseudomys nanus</i>)	S, N	Near Threatened		Near Threatened
Pale Field-rat (<i>Rattus tunneyi</i>)	S, N	Near Threatened		Near Threatened
Northern Nail-tail Wallaby (<i>Onychogalea unguifera</i>)	K	Near Threatened		Least Concern
Orange Horseshoe-bat Orange Leaf-nosed Bat (<i>Rhinonicterus aurantius</i>)	S, K, N	Near Threatened		
Reptiles				
Freshwater Crocodile (<i>Crocodylus johnstoni</i>)	S		Listed Marine Species	Least Concern
Saltwater Crocodile (<i>Crocodylus porosus</i>)			Migratory Listed Marine Species	Least Concern
Oenpelli Python (<i>Morelia oenpelliensis</i>)	K	Vulnerable		
Chameleon Dragon (<i>Chelosania brunnea</i>)	K, N	Near Threatened		
Northern Death Adder (<i>Acanthopis praelongus</i>)	K, N	Near Threatened		

Fauna Species	Recorded in Site Specific or Nearby Surveys	NT Status	Federal Status	IUCN Status
Yellow Spotted Monitor (<i>Varanus panoptes</i>)	K, N	Near Threatened		
Fish				
Freshwater Sawfish (<i>Pristis microdon</i>)			Vulnerable	Critically Endangered
Birds				
Gouldian Finch (<i>Erythrura gouldiae</i>)	K, N	Endangered	Endangered	Endangered
Red Goshawk (<i>Erythrotriorchis radiatus</i>)	K	Vulnerable	Vulnerable	Vulnerable
Partridge Pigeon (<i>Geophaps smithii</i>)	S, K, N	Near Threatened	Vulnerable	Near Threatened
Masked Owl (<i>Tyto novaehollandiae</i>)		Near Threatened	Vulnerable	Least Concern
White-browed Robin (<i>Eopsaltria cucullata</i>)	K	Near Threatened	Migratory	
Cattle Egret (<i>Ardea ibis</i>)	K		Migratory	Least Concern
Fork-tailed Swift (<i>Apus pacificus</i>)	K, N		Migratory	Least Concern
Little Curlew (<i>Numenius minutus</i>)	N		Migratory	Least Concern
Melville Cicadabird (<i>Coracina tenuirostris melvillensis</i>)	K		Migratory	Least Concern
Oriental Plover (<i>Charadrius veredus</i>)	N		Migratory	Least Concern
Oriental Pratincole (<i>Glareola maldivarum</i>)			Migratory	Least Concern
Rainbow Bee-eater (<i>Merops ornatus</i>)	S, K, N		Migratory	Least Concern
Rufous Fantail (<i>Rhipidura rufifrons</i>)	K, N		Migratory	Least Concern
White Egret (<i>Ardea alba</i>)	S, K, N		Migratory	Least Concern
White-bellied Sea-Eagle (<i>Haliaetus leucogaster</i>)	K, N		Migratory	
Magpie Goose (<i>Anseranas semipalmata</i>)	S		Listed Marine Species	Least Concern
Australian Bustard (<i>Ardeotis australis</i>)	K, N	Vulnerable		Near Threatened
Emu (<i>Dromaius novaehollandiae</i>)	K, N	Vulnerable		Least Concern

Fauna Species	Recorded in Site Specific or Nearby Surveys	NT Status	Federal Status	IUCN Status
Bush Thick-knee (<i>Burhinus magnirostris</i>).	S, K, N	Near Threatened		
Hooded Parrot (<i>Psephotus dissimilis</i>)	K, N	Near Threatened		Least Concern
Red-tailed Black Cockatoo (<i>Calyptrorhynchus banksii</i>)	S, K, N	Near Threatened		Least Concern
Square-tailed Kite (<i>Lophoictinia isura</i>)	K	Near Threatened		Least Concern
Star Finch (<i>Neochmia ruficauda</i>)	S, K	Near Threatened		
Yellow-rumped Mannikin (<i>Lonchura flaviprymna</i>)	K, N	Near Threatened		Least Concern

S = Site Specific Surveys; K = Kakadu Stage III Survey (Woinarski *et al.*, 1989); N = Other Nearby Surveys

The May 2006 survey also included a targeted search for the Gouldian Finch (*Erythrura gouldiae*). Areas of known preferred habitat for Gouldian Finches were surveyed during the early morning and late evening. Searches were also made of locations where other finch species were observed. No Gouldian Finches were observed during either the November 2005 or May 2006 survey.

Several introduced fauna species were observed during the November 2005 and May 2006 surveys. The species observed included feral cats, donkeys, horses, pigs and the cane toad. The water buffalo and feral cattle are known to be present in the region and were recorded from Kakadu National Park by Woinarski *et al.* (1989).

5.9 AIR QUALITY

Existing air quality in the project area is expected to be generally good given the lack of urban population or industry, and low emissions from the nearest industry and population centres. Suspended particulate levels are, however, expected to be elevated seasonally due to windblown dust, pastoral activities and bushfires.

The only facilities in the region reporting emissions to the National Pollutant Inventory (NPI) are the Union Reef Gold facility 13 kilometres away and two power stations in Pine Creek 30 kilometres away. Emissions for these facilities are characteristic of combustion engines and common to most populated areas, emissions of all substances are characterised as low by the NPI (NPI, 2006).

5.10 NOISE AND VIBRATION

There is no quantitative baseline noise or vibration data available for the project area. Subjective assessment from visits to site confirms that the current pastoral and mineral

exploration land uses result in the project area having a relatively low background level of noise. Noise levels would increase slightly on the haul route and railway siding close to the railway and Stuart Highway. Occasional noise generated by recreational use of the dams for water skiing would also be present.

The nearest residence to the mine is more than ten kilometres away. The nearest settlement is Pine Creek, about 23 kilometres away.

5.11 RADIOACTIVITY

The proposed mining areas are immediately adjacent to and sometimes coincident with a regional zone of above average uranium concentrations. A batch of 131 samples of ore and waste rock were analysed for uranium and thorium by Territory Iron. The results are fully described in Appendix 4. Median values of uranium in ore from the proposed pits are in the range of 10 to 44 parts per million. These levels are well below the recognised uranium ore grade of 200 parts per million.

Western Radiation Services provided advice on potential radiation levels (Appendix 8). The recorded values of uranium and thorium would result in an estimated exposure effective dose rate of 0.057 millisievert per annum (WRS, May 2006). Median concentration of uranium ore is more than an order of magnitude below the level where workers might receive the maximum recommended exposure to gamma radiation for members of the public.

Western Radiation Services completed a background gamma radiation and radon survey of the project area between 18 and 23 May 2006 (Appendix 9). The survey included a gamma radiation survey using a calibrated meter, targeted sampling using the meter results and electret monitoring for radon gas.

The survey area covered Ochre Hill, Helene 5, Helene 6/7, Thelma Rosemary, Thelma Rosemary (east) and Jasmine. Gamma radiation was also monitored in Pine Creek.

The gamma radiation measurements across the surveyed area are consistent with the normal background measurements for the world and above the natural background for Australia. The calculated background level for Pine Creek township is also above the natural background level for Australia. Based on the highest mean gamma reading for the site of 0.41 microsieverts per hour at Ochre Hill, the occupational gamma exposure of the mine workers was estimated to be 0.22 millisieverts per annum, which is below the one millisieverts per annum recommended exposure limit for members of the public (ARPANSA, 2005).

The highest radon activity level found in the mine site survey was 300 ± 18 Becquerels per metre at Ochre Hill, well below the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA, 2002) recommended limit of 1000 Becquerels per metre in the work place.

Two water samples from the project area analysed for radium were found to have normal levels of radium (WRS, May 2006).

6. EXISTING SOCIAL ENVIRONMENT

6.1 EUROPEAN HERITAGE

Pine Creek, about 30 kilometres south of the Frances Creek project area, is the largest settlement in the region. The town was first established during Gold rushes of the late 1800s. Mining first occurred at Frances Creek in the late 1960s as part of a second boom for the Pine Creek region based on uranium and iron ore mining. Damage from Cyclone Tracy in 1974 eventually led to closure of the Darwin–Pine Creek Railway and abandonment of the Frances Creek mine.

Searches of the Australian Heritage Database and the Northern Territory Office of Environment and Heritage Archaeological Resource Database were conducted. No registered historical sites were recorded from the Frances Creek area.

Mr Tim Hill completed an archaeological survey of the project area. The only site deemed to have heritage potential was the Frances Creek Railway embankment.

6.2 ABORIGINAL HERITAGE

The Frances Creek project area is in Jawoyn country. The traditional owners identify themselves as Munggay people.

A search of the Northern Territory Office of Environment and Heritage Archaeological Resource Database was conducted for the Pine Creek 1:250K map sheet. No Aboriginal archaeological or registered historical sites were recorded in the Frances Creek area. The Aboriginal Area Protection Authority (AAPA) has a record of an Aboriginal site within AN 389. This is outside the proposed mining areas.

Mr Tim Hill, assisted by Bessie Coleman conducted an Aboriginal sites survey. The survey recorded eight sites all with a moderate to low level of significance.

Territory Iron is in the process of obtaining an AAPA Authority Certificate for the Frances Creek Project.

6.3 NATIVE TITLE

The project area is subject to Native Title Claim NTD6021/01 by the Northern Land Council which is yet to be resolved. Territory Iron has entered into discussions with the traditional owners via the Northern Land Council and reached an agreement in regards to Aboriginal site and heritage protection, employment opportunities, mine site rehabilitation, and financial compensation when mining begins.

6.4 SOCIAL ENVIRONMENT

The Frances Creek project area is about 30 kilometres north of Pine Creek, which is the nearest population centre. The Pine Creek district has a population of about 500 people, of which 10% identified as being Aboriginal or Torres Strait Islander.

Major industries in the district are agriculture (beef and cattle), mining and tourism. Approximately 42% of the Pine Creek population is employed in the mining industry and 14% employed in the tourism industry.

6.5 VISUAL AMENITY

The project is in a sparsely populated area used primarily for pastoral activities. The mining operations will only be visible from private roads in the project area and possibly from inaccessible hilltops of adjacent pastoral leases. The nearest public road, Mt Wells Road, is eight kilometres away.

The haul road, rail siding and rail stockpile area will be visible to the public. The proposed haul road that follows rail embankment of the old spur line will be visible from some sections of the Mt Wells Road, though it will be unobtrusive and unlikely to be noticed by drivers. Roney Siding will be visible from the Alice Springs-Darwin Railway. The area currently consists of an unremarkable flat area of open woodland in front of some small hills and the Union Reef gold operation.

6.6 BITING INSECTS

The Medical Entomology Branch (MEB) of the Northern Territory Department of Health and Community Services completed a biting insect (mosquitoes and biting midges) assessment site visit and initial adult trapping program between 8 and 14 June 2006. Actual and potential mosquito breeding site recorded were:

- Small dam next to the Helene 3 Pit.
- Tailings swamp and associated dams.
- Typha species reed habitat of the Helene 11 Pit.
- Upper reaches of the Frances Creek Main Dam.
- Frances Creek Upper Dam.
- Small dam between Helene 4 and Helene 5 pits.
- Broad floodways near Ochre Hill (wet season only).

The maximum density of larval populations in the Frances Creek Project area was four larvae per 270 millimetres of water with the most common larval species being *Culex palpalis*, *Anopheles annulipes s.l.* and *Anopheles bancroftii*. The most commonly recorded adult species were *Culex annulirostris* and *Anopheles annulipes s.l.*

7. POTENTIAL IMPACTS AND MANAGEMENT

7.1 LANDFORM AND SOILS

Potential issues and impacts on landform and soils are re-establishment of a root zone suitable for plant growth after rehabilitation of disturbed areas, preventing erosion of rehabilitated surfaces, and preventing contamination by hydrocarbons.

Territory Iron's commitment to management and mitigation measures to address these issues are summarised in Table 4, Section 13.

Potential adverse impacts are expected to be minimal after implementing the management and mitigation measures. Long term change to the landscape will be minimal. Careful management of topsoil and its contained seed resource soil profiles will allow revegetation with local species. Rehabilitation will occur progressively through the mining operation and monitoring will allow supplemental seeding and remedial work to be carried out if necessary to ensure timely establishment of vegetation.

7.2 WASTE ROCK MANAGEMENT

Potential impacts and issues arising from waste rock management are:

- Acid development of soils, lack of acid neutralising capacity.
- Contamination of surface water or groundwater leading to toxic environmental effects.
- Erosion of external surfaces over time. This may lead to loss of sediments to surface water drainages or in extreme cases instability of structures.

Territory Iron's commitments to management and mitigation measures to address these issues are summarised in Table 4, Section 13. All waste rock stockpiles will be progressively rehabilitated. Waste characterisation indicates no potentially acid forming rock is present in the proposed ore or waste rock. No rock types will require special handling. Waste rock stockpiles will be shaped so that they form stable landforms.

Implementing the management and mitigation measures will result in minimal impacts from waste rock stockpiles. Leachate testing of waste rock samples indicated that slight dilution and oxygenation will reduce concentration of leachates from waste rock to below ANZECC 2000 trigger values for protection of freshwater ecosystems.

The waste rock stockpiles once rehabilitated will be stable vegetated landforms which have minimal impact on the environment and will allow resumption of pre-mining land use of low level grazing. Construction and rehabilitation of the Helene 5 and Thelma Rosemary waste rock stockpiles will result in substantially improved rehabilitation of 8.1 hectares of Thelma 2 waste rock stockpile and 19.0 hectares of the former TSF and stockpile area.

7.3 GROUNDWATER

The proposed mining and processing operations pose the following potential groundwater related issues:

- Lowering localised groundwater levels as a result of mine dewatering.
- Lowering localised groundwater levels as a result of abstraction of water for use in crushing and screening operations and other ancillary uses.
- Discharging water from mine dewatering causing localised recharge of groundwater.
- Deteriorating local groundwater quality as a result of seepage of contamination from mining activities into local aquifers after mining has ceased.

Pits will be located in elevated parts of the landscape. Based on exploratory drilling and the hydrogeology report (AGT, February 2006) it is anticipated that dewatering will not be required at any other pits. AGT indicated that drawdown from dewatering would be highly localised, limited in extent and reversible, with full recovery of water levels one wet season after pumping ceases. Maximum drawdown at 3000 metres distance from the pit after six months dewatering was estimated to be about three metres. The likely range of impact was estimated to be four kilometres. The nearest other uses of groundwater are pastoral bores, which are beyond this distance, so their yields will not be affected.

Based on measured water quality in existing pits, AGT concluded that:

- The low salinity of existing pits indicates that they are acting as collectors and groundwater recharge points during the wet season and evaporative discharges (groundwater sinks) during the dry season.
- Very little through flow is occurring.
- Contaminants in pit lakes are likely to remain there or move only very short distances into surrounding fractured rock aquifers when driven by a recharge event. Subsequent evaporative discharge is likely to reverse this movement back towards the pit.

Management and mitigation measures to prevent or minimise adverse impacts on groundwater are summarised in Table 4, Section 13 and focus on monitoring of groundwater.

Potential impacts of dewatering drawdown will be highly local. No other users of groundwater will be affected. Water levels will recover quickly on cessation of dewatering.

Little through flow will occur of groundwater through abandoned pits, meaning any potential contamination of pit water will be contained locally to the pits.

7.4 SURFACE WATER

The proposed mining and processing operations pose the following potential surface water issues:

- Temporary reduction of surface water volume to water courses from diverting of runoff from operational areas.

- Contamination of surface water from release of contaminants associated with earthmoving, excavation, stockpiling and ore processing. Potential contaminants include sediment, turbidity and hydrocarbons.
- Increased water flow to existing dams and to Frances Creek as a result of release of water from mine dewatering operations.
- Contamination of surface water runoff and soils from flow over stockpiles and areas where ore is spilt during loading of ore product from the siding stockpile into rail containers.
- Contamination of surface waters due to release of treated sewage effluent.
- Flooding of operational areas including the ore product haul road.

Management and mitigation measures to prevent or minimise adverse impacts on groundwater are summarised in Table 4, Section 13.

All infrastructure except some small sections of roads is designed to be on high ground above projected 100-year Average Recurrence Interval (ARI) flood levels. Road crossings will be designed to survive extreme rainfall events while allowing natural flows to pass, but may become temporarily unusable for traffic while water levels are high.

Extreme rainfall events are likely to cause overtopping of all the water storage dams on Frances Creek. The water to be stored in these facilities is of suitable quality for release to the environment, and a discharge licence will be acquired to allow these facilities to discharge via their spillways during high rainfall events.

Management commitments to prevent or minimise adverse of extreme rainfall events are summarised in Table 4, Section 13.

A surface water monitoring program will be implemented under the Environmental Management Plan. The water monitoring program will comprise regular sampling of water upstream and downstream of all mining activities. Monitoring results will be reviewed regularly and reported to NRETA in annual environmental reporting.

Waste rock and ore characterisation and sampling of pit inflows indicates that all runoff and dewatering discharge will be of suitable quality for discharge to the environment.

Implementing management measures including sedimentation ponds, water re-use, dilution and timing of discharge will result in minimal adverse impacts on water quality within or downstream of the project area.

7.5 VEGETATION AND FLORA

Potential impacts on vegetation and flora are:

- Clearing of approximately 172 hectares of native vegetation, of which 78 hectares has been previously disturbed.
- Potential to introduce and/or spread of weed species.
- Changes to creek line vegetation due to dewatering discharges.

Territory Iron's commitments to management and mitigation measures are summarised in Table 4, Section 13. Implementing these commitments will ensure impacts on vegetation and flora are minimised.

7.6 FAUNA

Development and operation of the Frances Creek Project raises the following issues:

- Removal of about 172 hectares of habitat during the life of the mine, of which 78 hectares (45%) has been previously disturbed.
- Disturbance of the Freshwater Crocodiles residing within the pit waters of Helene 4.
- Removal of part of the Tailings Swamp habitat for waterbirds due to construction of the Helene 5 waste rock stockpile.
- Placement of waste rock stockpiles across minor creeks and over the Tailings Swamp will remove habitat available for aquatic animals.
- Removal of Ghost Bat roost through destruction of the historical conveyor tunnel.
- Adverse impacts on species of conservation significance such as the Orange Horseshoe Bat, Arnhem Sheathail Bat, Partridge Pigeon, Pale field-rat, Western Chestnut mouse and Calaby's Pebble-mound mouse.
- Death of animals on mine roads and the haul road to the Alice Springs–Darwin Railway.
- Control of feral animals such as donkeys, horses, cats and pigs.
- Development of breeding habitat for biting insects.

Commitments to manage these impacts are outlined in Table 4, Section 13. Implementing these measures will ensure these impacts are minimised.

7.7 AIR RESOURCES MANAGEMENT

Air emissions will be limited to emissions from internal combustion engines and dust. Greenhouse gas emissions are estimated to total 34,833 tonnes CO₂ equivalent over the life of the project. More than 99% of emissions will result from fuel combustion. Clearing of vegetation will result in an initial release of an estimated 30,000 tonnes CO₂ equivalent which will be offset by revegetation once the project is completed.

Territory Iron will apply industry best-practice standards to minimise and control dust emissions and combustion engine emission and greenhouse gases. Territory Iron's commitments to management and mitigation measures are summarised in Table 4, Section 13.

The remote location of the project (over eight kilometres from the nearest residence) limits potential adverse impacts of air emissions on the local or regional environment and/or human health. Dust emissions that are generated will be localised. Territory Iron aims to limit as far as practicable the production of greenhouse gases and other products of combustion.

7.8 NOISE AND VIBRATION MANAGEMENT

Noise generated will be due primarily to mobile equipment, ore transport, blasting, and the processing plant.

Territory Iron is committed to management and mitigation measures to minimise noise and vibration impacts as summarised in Table 4, Section 13. All mining and processing operations at Frances Creek will comply with the National Standard for Occupational Noise [NOHSC: 1007(2000)].

As with air quality, impacts of noise and vibration emissions from the project are not anticipated to be significant due to the remote location and distance from the nearest residence (over eight kilometres away). Controls and barriers implemented to meet DPIFM requirements to protect the occupational safety of employees will ensure impact on the nearest residence will not be significant.

7.9 RADIOACTIVITY

Ore and rock characterisation and background radiation studies of the project area indicate that radiation levels in the area will result in workers being exposed to radiation levels within recommended limits, but above the general natural background level in Australia.

Territory Iron aims to achieve radiation exposure as low as reasonably possible. To achieve this Territory Iron has committed to a number of management and mitigation measures summarised in Table 4, Section 13.

Implementing management and mitigation measures will result in levels of radiation exposure to workers well within industry standards for members of the public and probably within the range of normal world background levels. Exposure of members of the public will be far lower due to increased distance from ore and much lower exposure times.

7.10 WASTE AND HAZARDOUS MATERIALS

Potential issues associated with waste and hazardous materials are limited to spillage and incorrect storage of hydrocarbons and explosives, spillage of ore, and disposal of non hazardous waste in an onsite landfill.

Territory Iron is committed to implementing the management and mitigation measures summarised in Table 4, Section 13, including compliance with all relevant regulations regarding waste disposal and storage.

By implementing appropriate storage and handling measures in accordance with industry standards and practices, dangerous goods and hazardous substances used in the operations will not present a hazard or cause environmental harm.

7.11 TRANSPORT

Potential impacts and issues relating to transport include dust and noise, road safety issues, and increased traffic and maintenance demands on roads, rail and port infrastructure.

To minimise impacts of transport associated with the mine, management commitments summarised in Table 4, Section 13 will be implemented.

Impacts of traffic between the mine and Pine Creek will be low due to low traffic numbers.

Impacts of haulage traffic using Route 1 will also be minimised due to the only contact with non-mine traffic being a single well designed intersection.

If Route 2 is adopted, a seven kilometre section of Mt Wells Road will carry significantly increased traffic. Road improvements and maintenance, signage and the low level of existing traffic will keep impacts to a manageable level.

7.12 CULTURAL ENVIRONMENT

A cultural heritage survey undertaken in October 2005 indicated that the Frances Creek railway was the only European heritage object of value. The survey concluded that the heritage value of the railway would not be affected, as the proposed use is consistent with historical use of the area.

Potential Aboriginal cultural impacts include:

- Un-authorised destruction or damage to identified sites.
- Identification of additional Aboriginal sites or artefacts during the mining process.
- Increased levels of employment among the local indigenous population

Table 4, Section 13 outlines management commitments proposed to minimise the negative impacts of the project. Through appropriate management of cultural issues there is not expected to be a negative impact from the Frances Creek Project on cultural values of the area. The project has potential to provide positive impacts on the cultural environment of the area, particularly through increased awareness of indigenous issues and culture.

7.13 SOCIO-ECONOMIC ENVIRONMENT

Potential socio-economic impacts are largely positive, increasing population and expenditure and work opportunities in Pine Creek. There is a possible negative impact on tourist use of the immediate mine area.

To ensure the socio-economic impacts of the project are as beneficial as possible, the management commitments summarised in Table 4, Section 13 will be implemented.

Implementing the management and mitigation measures will result in a low risk of the project negatively impacting the socio-economic environment. The project is expected to have a positive affect on the socio-economic environment particularly through local employment and expenditure.

7.14 VISUAL AMENITY

The project area is not visible from any public roads. The visual impact of the project will be negligible other than increased traffic crossing or using Mt Wells Road. Proposed management and rehabilitation measures will result in minimal visual impact even within the project area once rehabilitation is complete.

7.15 BITING INSECTS

Potential issues and impacts relating to biting insects are:

- Local transmission of mosquito carried diseases such as malaria.
- Increase in adult mosquito populations to pest proportions.
- Reduction of potential mosquito and biting midge habitat through covering of the old tailings swamp by constructing the Helene 5 waste rock stockpile.

Commitments to minimise and mitigate potential negative impacts are outlined in Table 4, Section 13. Through implementation of these measures and education of employees, adverse impacts will be managed effectively.

8. ENVIRONMENTAL PROTECTION AND BIODIVERSITY ACT TRIGGERS

The Frances Creek Project has been deemed a controlled action under the Federal *Environment Protection and Biodiversity Conservation Act 1999*. The controlling actions are:

- World Heritage (Sections 12 and 15A).
- Listed threatened species and communities (Sections 18 and 18A).
- Listed migratory species (Sections 20 and 20A).

8.1 WORLD HERITAGE

The Frances Creek project area lies about 18 kilometres from the boundary of the Kakadu National Park World Heritage Area. This is sufficiently far enough away that the project will have no visual, dust or noise impacts upon the World Heritage values of the park. There is potential for surface water runoff to impact upon the water quality of the Mary River and subsequently Kakadu National Park.

Groundwater intercepted during mining activities will be directed to the Helene 11 Dam. During the wet season the Helene 11 Dam overflows into the Frances Creek Main Dam which also overflows, spilling into the Frances Creek and ultimately flowing into the Mary River. Dewatering discharges from the Frances Creek Mine will be diluted by water in both dams and surface water flowing into the Frances Creek before reaching the Mary River. Groundwater inflows to Helene 6/7 Pit have been analysed and found to meet ANZECC trigger values for protection of freshwater ecosystem, other than for aluminium, which was well within the range observed in natural watercourses in the project area and not likely to be harmful to local species.

A water monitoring program will be established to ensure there are no adverse impacts on the water quality of the Mary River.

8.2 LISTED THREATENED SPECIES

Seven fauna species listed as threatened under the *EPBC Act 1999* have been identified as potentially occurring in the project area. No threatened flora species or TECs have been identified in the project area or nearby areas. The fauna species identified were:

- Bare-rumped Sheath-tail Bat (*Saccolaimus saccolaimus nudicunius*).
- Northern Quoll (*Dasyurus hallucatus*).
- Freshwater Sawfish (*Pristis microdon*).
- Gouldian Finch (*Erythrura gouldiae*).
- Red Goshawk (*Erythrotriorchis radiatus*).
- Partridge Pigeon (Eastern) (*Geophaps smithii smithii*).
- Masked Owl (northern) (*Tyto novaehollandiae kimberli*).

Of these species, only the Partridge Pigeon was observed during the November 2005 and May 2006 surveys. With the exception of the Masked Owl and Bare-rumped Sheath-tail Bat, the remaining species have been recorded during surveys of nearby areas. Additionally, all species (excepting the Masked Owl and Bare-rumped Sheath-tail Bat), have been recorded by Woinarski *et al.* (1989) from Kakadu National Park Stage III.

Most of the habitats disturbed by the Frances Creek Project do not represent preferred habitat for the above listed species. Implementing management commitments detailed in Table 4, Section 13 will ensure that any potential impacts on threatened species are minimised and/or mitigated.

8.3 LISTED MIGRATORY SPECIES

A number of species listed as migratory under the *EPBC Act 1999* have been identified as potentially occurring in the Frances Creek project area. This includes five migratory wetland bird species, seven migratory terrestrial bird species and one migratory reptile species. Of these species, only the White Egret (*Ardea alba*) and Rainbow Bee-eater (*Merops ornatus*) were recorded during the November 2005 and May 2006 surveys.

As for the listed threatened species, most of habitats disturbed do not represent preferred habitat for these species. Additionally, these species are highly mobile and will be able to relocate to nearby areas of similar habitat.

Management commitments to minimise and mitigate any potential impact upon migratory species are detailed in Table 4, Section 13.

9. REHABILITATION AND CLOSURE

The primary objectives of Territory Iron rehabilitation strategies are to:

- Ensure the physical and geochemical stabilisation of all project components in the short and long-term.
- Progressively rehabilitate disturbed areas and habitat using local, native species.
- Protect the public, domestic animals and wildlife from injuries.
- Allow a return to pre-mining land use (pastoral) once full decommissioning of operations is complete.

To ensure the objectives are met, Territory Iron will prepare and implement a Rehabilitation Plan as part of the Mining Management Plan.

Progressive rehabilitation will occur wherever practicable. Only indigenous species will be used for rehabilitation of disturbed areas. Ideally revegetation will occur through careful management of topsoil and its contained seed resource. Annual monitoring will be conducted to establish the effectiveness of rehabilitation. Supplementary seeding or planting may occur if rehabilitation monitoring demonstrates that revegetation is not proceeding in line with expected results.

As part of obtaining all permissions necessary to commence mining, Territory Iron will submit to DPIFM a security bond in case of any unplanned failure of the project. The size of this security bond will be regularly reviewed in conjunction with DPIFM to ensure it remains consistent with the level of disturbance caused by the project at any specific time

Territory Iron Limited will prepare a Closure Plan within the first year of operations. The Closure Plan will be reviewed every three years. Implementation of the Closure Plan will be based on results derived from progressive rehabilitation activities and discussions with post-mining land users.

On final decommissioning, plant and infrastructure will be dismantled, made safe and removed from the site. Infrastructure such as bores and roads will not be decommissioned if post-mining land users request their retention.

10. RISK MANAGEMENT

As part of the design, construct and operate contracts let by Territory Iron for the ore processing and mining, HAZOP style risk assessments will be conducted for operational aspects. The results of these assessments will be used to minimise risk for the project.

All personnel will be required to participate in a site specific induction addressing hazards, environmental requirements and social issues at the start of their employment.

Territory Iron will develop and maintain a suitably qualified and trained Emergency Response Team for the duration of the project. Training will be provided to all personnel identified within the Emergency Response Plan to ensure they understand their individual responsibilities with regard to implementing the plan.

To minimise the risks associated with bushfire, firebreaks will be installed and maintained around key pieces of infrastructure. Fire extinguishes will be maintained in operational areas and in all vehicles and mobile equipment.

In common with all mining and processing operations, the mine will present hazards and risks. A Safety Management System will be developed for the project. Details of the system will be included in the Mining Management Plan provided to DPIFM.

All contractors will be required to have their own documented safe work practices and procedures. Territory Iron will require these to be compliant with the project Safety Management System.

11. ENVIRONMENTAL MANAGEMENT DOCUMENTS

11.1 ENVIRONMENTAL MANAGEMENT SYSTEM

Territory Iron will develop and implement an Environmental Management System (EMS). The EMS will support an Environmental Management Plan (EMP) and provide a formal description of the methodical framework for managing environmental issues. The EMS will ensure the operation maintains high levels of environmental performance and does not cause environmental harm. The EMS aims to describe procedures, practices and review processes to implement environmental considerations into all aspects of operations. The EMS will be a dynamic document that will change to meet the needs of stakeholders, evolving performance requirements and customer and community expectations. An important component of the EMS is a platform for ongoing review and reporting of environmental performance of operations in a quantifiable and consistent manner.

11.2 ENVIRONMENTAL MANAGEMENT PLAN

An Environmental Management Plan (EMP) will be developed in consultation with DPIFM and NRETA before construction starts. Development of an EMP is an integral component of the Mining Management Plan under Section 40 of the *Mining Management Act*.

The objective of an EMP is to clearly describe key environmental strategies to be adopted by Territory Iron to manage the project in accordance with the company's Environmental Policy and statutory environmental requirements. The management plans and strategies outlined within the EMP document will apply to all components of the project during construction, operation and closure phases. The EMP will be binding on all Territory Iron employees and contractors.

The EMP will be reviewed in the first year of operations to incorporate the environmental plans developed during construction. During operations, the EMP will be reviewed and periodically updated, if necessary, to reflect knowledge gained during the course of construction and operations. The review will ensure key environmental strategies to be adopted by Territory Iron are still adequate to achieve objectives of the company's Environmental Policy and statutory environmental requirements.

A draft EMP is contained in Volume 2 of the PER Report as Appendix 12.

12. PUBLIC INVOLVEMENT AND CONSULTATION

Territory Iron initiated a stakeholder consultation process for the project before it submitted the Notice of Intent in November 2005. Territory Iron prepared a consultation strategy to facilitate effective communication with regulators, local and wider community and other stakeholders. This allowed issues raised during the consultation process to be taken into consideration in the project's design, development, operation and closure.

Significant stakeholders were identified through discussions with DPIFM, NRETA and the Northern Land Council. Territory Iron has continued to consult stakeholders on a regular basis. Consultation has included public presentations, government presentations and one-on-one discussions with pastoral leaseholders, environmental groups, community groups, local members of parliament, government departments, members of local Aboriginal communities and Native Title claimants. The consultation strategy includes, but is not limited to, community updates, mail-outs, newsletters, website information, display materials, letters, personal visits, newspaper articles, radio advertising, site tours, presentations and community meetings. The consultation strategy has been included in the project scheduling and will continue throughout the life of the project.

13. SUMMARY OF COMMITMENTS

Commitments made throughout Volume 1 of the PER are summarised in Table 4 with the commitment number referencing the section of the document in which they were made.

Table 4: Summary of Territory Iron Commitments for the Frances Creek Project

Commitment Number	Commitment
Landform and Soils (PER Section 8.1)	
8.1.2.1a	Stripping topsoil to a depth of about 100 millimetres where practicable and placing directly onto rehabilitation areas or stockpiles. Completing direct replacement wherever practicable.
8.1.2.1b	Placing stockpiled topsoil in windrows less than two metres high to minimise loss of seed viability and soil biota.
8.1.2.1c	Progressive rehabilitation will be undertaken wherever practicable. All rehabilitation will be performed in accordance with contemporary accepted industry best practice and conducted in accordance with an approved MMP.
8.1.2.1d	Stripping and stockpiling of topsoil (where required) in dry and preferably still wind conditions, to minimise dust generation and assist rapid revegetation.
8.1.2.2a	Controlling slope gradients to minimise erosion and soil loss.
8.1.2.2b	Installing diversion bunds and drains as necessary to control local surface water runoff to minimise overland flow and consequential erosion.
8.1.2.2c	Ripping rehabilitation areas on the contour to remove compaction, improve soil structure and improve infiltration capacity.
8.1.2.2d	Routinely inspecting rehabilitated and disturbed surfaces for erosion, particularly after significant rainfall. Implementing appropriate remediation measures if soil erosion is observed during routine inspections.
Waste Rock Management (PER Section 8.2)	
8.2.2a	Designing waste rock stockpiles to a maximum height of 45 metres with gentle slopes (between 1 and 18 degrees) to facilitate controlled water shedding.
8.2.2b	Contouring waste rock stockpiles so that they tie in with surrounding topography. The maximum height will not exceed 45 metres and will be less than or equal to the height of existing nearby ridges so that the final design is aesthetically pleasing.
8.2.2c	Building diversion drains wherever stockpile construction obstructs significant water courses.
8.2.2d	Deep ripping waste rock stockpiles on the contour to assist water absorption and minimise erosion.
8.2.2e	Spreading waste rock stockpiles with local topsoil once shaping is complete to facilitate revegetation.
8.2.2f	Waste rock will be used to backfill pits where total sulphur values in exposed siltstone waste rock in open pits exceed 0.1%S to minimise contact between in-pit water and siltstone in final pit voids.

Commitment Number	Commitment
Groundwater (PER Section 8.3)	
8.3.2a	Regularly monitoring abstraction volumes and depth to water in production bores and monitoring bores during the life of the operation to enable Territory Iron to gain a better understanding of behaviour of underlying aquifer systems and the impacts of abstraction.
8.3.2b	Installing groundwater monitoring bores in areas close to the Helene 11 Dam and Helene 5 and 6/7 pits to evaluate changing groundwater levels and allow early detection of any contaminated seepage from mining-related activities.
8.3.2c	Monitoring quality of water collected in pit sumps before re-use for ancillary uses. Water will not be re-used if analytical results indicate it is of low pH.
8.3.2d	Quarterly water quality monitoring of production bores and monitoring bores during the life of the operation to enable Territory Iron to determine effects of mining.
8.3.2e	Conduct a formal aquifer review every two years using all monitoring data. Results will be provided to regulatory authorities and other interested stakeholders.
Surface Water (PER Section 8.4)	
8.4.2a	Designing waste rock stockpiles to a maximum height of 45 metres with gentle slopes to facilitate controlled water shedding
8.4.2b	Constructing protection bunds and diversion channels to prevent flooding of pits, process areas, or other mine infrastructure.
8.4.2c	Directing runoff from the stockpile and plant area to the Helene 11 Dam which will act as a settling pond and allow reuse of water.
8.4.2d	Building out of pit waste rock stockpiles to prevent interference with natural surface water drainage or where this is not practicable to minimise impacts.
8.4.2e	Directing surface water runoff from ore product stockpile areas at the rail siding through purpose-built drains to a sedimentation pond before discharge into existing railway drains.
8.4.2f	Preventing sediment release to watercourses by installing sediment-control structures at discharge points where release of sediment is identified as a potential risk.
8.4.2g	Installing culverts and/or floodways where mining haul roads and the ore product haul road cross watercourses.
8.4.2h	Wastewater in the form of sewage and grey water from workshop and office areas will be treated in approved waste water systems on or off site. No waste water will be discharged to any surface water for any purpose.
8.4.2i	A sewage treatment system will be installed to service the office and workshop area in accordance with the requirements of the <i>Northern Territory Public Health Act</i> and Regulations including the Code of Practice for small onsite sewage and sullage treatment systems and the disposal or reuse of sewage effluent.
8.4.2j	Hydrocarbons and other hazardous materials will be stored in appropriately designed self bunded tanks or bunded storage areas.
8.4.3a	A water release management plan will be developed for the disposal of excess mine water.

Commitment Number	Commitment
8.4.3b	A water discharge licence will be obtained from NRETA to permit release of water from Frances Creek Dam to Frances Creek, and from pit stormwater sumps to Maude Creek tributaries. All water releases to the environment will meet approved water quality criteria as defined in the discharge licence.
8.4.3c	In pit sumps will be built to contain stormwater and allow re-use for in pit dust suppression. All water discharged from pits to watercourses will be passed through sedimentation basins.
8.4.4a	To prevent potential overflow of pit lakes in Jasmine Central and Thelma 2 pits, stormwater will only be pumped to these pits as long as there is sufficient freeboard in the pits to contain runoff from a 1 in 100-year average recurrence interval, 72 hour duration rainfall event.
8.4.4b	All dam spillways will be inspected before each wet season, and after each discharge event and repairs carried out if necessary.
8.4.5a	A water monitoring program will be implemented under the Environmental Management Plan.
8.4.5b	The water monitoring program will include regular sampling of water upstream and downstream of all mining activities within the tenements and stockpiling at Roney Siding. Monitoring results will be reviewed regularly against past monitoring and ANZECC guidelines to detect any deterioration in water quality and allow action to be taken
8.4.5c	The water monitoring program will include analysis of water potentially to be discharged to the environment prior to any such discharge.
Vegetation and Flora (PER Section 8.5)	
8.5.2.1a	Developing a Vegetation Clearing Management Procedure as part of the EMP.
8.5.2.1b	Obtaining necessary licences and permits to clear land associated with the Frances Creek project area.
8.5.2.1c	Minimising the impact of clearing by restricting vegetation clearing to the minimum necessary for operations.
8.5.2.1d	Wherever possible locating operations on areas already disturbed by previous mining.
8.5.2.1e	Clearly delineating the perimeter boundary of all areas approved for clearing before clearing works begin.
8.5.2.1f	Clearly marking the patch of cycads near the Ochre Hill road so they are not disturbed during road-widening activities.
8.5.2.2a	Preparing a Weed Management Plan as part of the EMP. The plan will include, but will not be limited to, issues of vehicle and personal hygiene in regards to weeds, identification of weed species (including noxious weeds) and control and eradication measures.
8.5.2.2b	Confining company vehicles to travelling on purpose-built roads to minimise potential vehicle-borne spread of weed species.

Commitment Number	Commitment
Fauna (PER Section 8.6)	
8.6.2a	Requiring employees and contractors to attend an induction program that will include a component on environmental management. In particular, the induction will clearly explain employee and contractors' roles and responsibilities to restrict impacts on fauna and habitat.
8.6.2b	Educating all employees and contractors to recognise species of conservation significance, particularly the Gouldian Finch, and requiring them to report any sightings to the Environmental Manager.
8.6.2c	Reporting sightings of species of conservation significance to the Northern Territory Parks and Wildlife Commission.
8.6.2d	Liaising, with the Northern Territory Parks and Wildlife Commission to ensure that appropriate relocation measures are used to relocate Freshwater Crocodiles, when required.
8.6.2e	Developing a Gouldian Finch monitoring program and Management Plan in consultation with relevant consultants and the Northern Territory Parks and Wildlife Commission.
8.6.2f	Disturbing roosting Ghost Bats in the old conveyor tunnel at dusk two or three days before destroying the tunnel and checking to ensure no bats remain.
8.6.2g	Investigating, in consultation with relevant experts, the possibility of constructing an alternative roost site for Ghost Bats either during mining operations or when mining stops.
8.6.2h	Restricting speeds on haulage routes and mine roads to minimise fauna death on roads.
8.6.2i	Developing a Wildlife Rescue Procedure to operate in conjunction with land-clearing operations and where vehicle movements occur between dusk and dawn.
8.6.2j	Participating in feral animal control programs on Ban Ban Springs and Mary River West stations, if requested by owners.
8.6.2k	Banning domestic animals and firearms on site.
8.6.2l	Building sections of waste rock stockpiles that impact on creek lines or the Tailings Swamp during the dry season.
Air Resources (PER Section 8.7)	
8.7.2.1a	Installing high pressure, low volume sprays at the crusher, on conveyors and over stockpiles for dust suppression and procedures applied in line with industry practice.
8.7.2.1b	Maintaining and operating pollution control devices, such as extractors, conveyor covers and sprinklers installed at point sources in good working order.
8.7.2.1c	Regularly maintaining generators and stationary plant to manufacturers' specifications to minimise exhaust emissions.
8.7.2.1d	Reporting emissions as part of the National Pollutant Inventory.
8.7.2.1e	Taking all practicable measures to minimise energy consumption.
8.7.2.2a	Requiring vehicles travelling on unsealed roads to travel at speeds that will not generate excessive dust.

Commitment Number	Commitment
8.7.2.2b	Applying water to unsealed roads, especially haul roads, to minimise dust emissions. Modifying the volume and frequency of water applied to control dust emissions in different climatic conditions.
8.7.2.2c	Limiting movement of mobile equipment and vehicles to clearly marked routes or areas where dust control methods can be used.
8.7.2.2d	Employees and contractors will participate in site inductions to ensure they are aware of site rules for permanent and temporary roads.
8.7.2.2e	Banning vehicle access on rehabilitated surfaces except for management purposes.
8.7.2.2f	Rehabilitating and revegetating completed areas as soon as practicable.
8.7.2.2g	Progressively rehabilitating areas to minimise exposure to wind erosion. Vegetation established will be compatible with the post-mining land use of the area
8.7.2.2h	Placing topsoil stripped from the product ore stockpile area in a windrow at the edge of the stockpile area. Forming the stockpile to reduce ground surface winds and minimise wind erosion.
8.7.2.3a	Joining the Federal Government's Greenhouse Challenge program and monitoring greenhouse emissions and efficiency.
8.7.2.3b	Energy efficiency will be a major consideration in the selection and design of equipment and plant.
8.7.2.3c	Encouraging all employees to be energy efficient in their day to day activities and educating them on this.
Noise and Vibration (PER Section 8.8)	
8.8.2a	Equipment generated noise will be reduced by installing soundproofing and/or noise abatement devices around/on primary sources of noise such as power generators and water pumps.
8.8.2b	Vibration generated by equipment will be reduced by installing shock-absorbing devices or materials around the primary sources of vibration such as the ore processing equipment and water pumps.
8.8.2c	The natural acoustic barriers (for example trees and ridges) between noise sources and neighbouring communities will be maintained as far as practicable.
8.8.2d	Hearing protection equipment will be made available and utilised in onsite areas where engineering controls are deemed inappropriate or ineffective.
Radioactivity (PER Section 8.9)	
8.9.2a	Stockpiling ore in open areas to prevent possible build up of radon gas.
8.9.2b	Mine personnel will be accommodated in Pine Creek, well away from the mineralised areas of the mine site.
8.9.2c	Ore will be blended at the crushing stage to keep overall uranium concentration well below levels of concern.
8.9.2d	Trialling personal dust monitors in initial mining of higher uranium areas to confirm exposure to uranium through dust is minimal.
8.9.2e	Installing passive radon monitors to measure radon gas exposure over a three month period.

Commitment Number	Commitment
8.9.2f	Potential radiation exposure of workers will be reviewed whenever additional monitoring data becomes available.
8.9.2g	Workers will be required to follow a strict hygiene policy, in particular they must wash their hands before eating, drinking or smoking.
8.9.2h	Access to the project site will be limited to employees and authorised visitors. All project access will be well signposted to control traffic movement in and out of the project area.
Waste and Hazardous Materials (PER Section 8.10)	
8.10.2.1a	Managing hazardous and non-hazardous material in accordance with statutory regulations, standard industry structures and procedures. Adopting strict procedures to ensure adequate records of delivery and use are maintained to ensure earliest possible detection of losses and to avoid site contamination.
8.10.2.1b	Developing and maintaining a register of all hazardous materials imported to the site or generated as a result of activities undertaken at the site. This will document the hazardous material name, location, approximate volume, storage method and, where applicable, disposal method for the substance and containers.
8.10.2.1c	Maintaining an inventory of hydrocarbon use to easily determine whether storage containers are leaking.
8.10.2.1d	Bringing hazardous materials to the site in bulk packaging wherever possible. This practice will minimise the number of containers and reduce risk of spillage.
8.10.2.1e	All mobile equipment and light vehicle servicing activities including wash down will be conducted on impermeable surfaces.
8.10.2.1f	A wash down facility incorporating a concrete base and a triple interceptor style sediment and oil/grease removal system will be provided for the workshop facility.
8.10.2.1g	Refuelling of mobile equipment will primarily be conducted on a sealed surface, however some refuelling will take place within the open pits and siding stockpile area using a mobile refuelling vehicle.
8.10.2.1h	The mobile refuelling truck will carry spill containment and cleanup material at all times and the driver will be trained in the use of these materials.
8.10.2.1i	Explosives magazines will be constructed and operated in accordance with regulatory requirements.
8.10.2.1j	A licence to store Dangerous Goods will be obtained for the storage of diesel fuel on site.
8.10.2.2a	The landfill onsite will only receive solid wastes classified as non-hazardous (inert and putrescible).
8.10.2.2b	The onsite landfill will be constructed and operated in accordance with the <i>Guidelines for the Siting, Design and Management of Solid Waste Disposal Sites in the Northern Territory</i> (EPA 2003). It will consist of a trench type facility located on the Helene 6/7 waste rock stockpile, greater than 150 metres from any watercourse, and 400 metres from the site offices and workshops. Surface runoff will be diverted around the landfill trench and wastes will be covered with 150 millimetres of waste rock at least once per month.
8.10.2.2c	Domestic waste from the accommodation camps and offices will be properly handled, transported to and disposed of in the onsite landfill.

Commitment Number	Commitment
8.10.2.2d	Territory Iron will promote the reuse and recycling of waste packaging and construction materials, and used equipment/parts, tyres and metal to maximise resources conservation and value recovery, and minimise disposal in the onsite landfill.
8.10.2.2e	Reusable pressurised containers and vessels will be returned to suppliers. Pressurised containers and vessels that are not reusable will be punctured using suitable equipment and disposed of in the onsite landfill.
8.10.2.2f	Territory Iron staff and contractors will be trained in proper handling and disposal of waste material.
8.10.2.3a	Hazardous waste generated by the operation will be transported offsite to licensed waste disposal facilities. This is likely to include waste oil, grease, batteries and heavy equipment fuel filters.
8.10.2.3b	Solutions drained from punctured pressurised containers and vessels will be managed as hazardous wastes and appropriately disposed of offsite.
8.10.2.3c	Hazardous materials and wastes will be stored in appropriately labelled containers within bunded areas.
8.10.2.4a	An Emergency Response Plan will be developed for the project. This plan will contain information regarding appropriate response to chemical spillages, leaks, fires or explosions.
8.10.2.4b	A representative of Territory Iron will be assigned to liaise with Pine Creek emergency services regarding hazards on site and response procedures.
Transport (PER Section 8.11)	
8.11.2a	A commuter bus run will be employed to transport workers between Pine Creek and the mine. Regular bus runs will be limited to a maximum of three return trips per day.
8.11.2b	Carrying out additional maintenance on stream crossings on the Mt Wells Road between Pine Creek and the mine as necessary to improve all-weather access.
8.11.2c	Erecting warning signs at the junction of Frances Creek Road and Mt Wells Road to advise the public they are entering private property and must comply with all directions issued by Territory Iron. Discouraging casual access. Erecting fences and gates at this intersection if the public continues to access the mine area along this road.
8.11.2d	The intersections between the proposed haul route and Mt Wells Road will be constructed to DPI requirements.
8.11.2e	If Route 2 is adopted for ore haulage then the affected section of Mt Wells Road will be upgraded by Territory Iron to DPI standards including improved sight lines and water course crossings and appropriate signage.
8.11.2f	Drivers will work in standard shifts. No long periods of continuous driving are required. Road train transport cycles to the mine will be about 70 minutes return including loading and unloading. Drivers will be able to leave the cabin during loading operations and have sufficient time to take coffee, meal or rest breaks.
8.11.2g	Road train drivers will use radio communications to coordinate safe passing. Only one to two road trains will operate at any time.
8.11.2h	Licensed road going vehicles will be used for haulage and standard axle loadings will be complied with.

Commitment Number	Commitment
8.11.2i	Sufficient freeboard will be left at the top of all trailers when loading to ensure ore product can not spill.
8.11.2j	A truck washdown facility will be installed at the mine at which all vehicles will be washed down and made free of product before leaving the site.
8.11.2k	All road trains will comply with Australian road rules for noise emissions.
8.11.2l	Territory Iron will comply with the requirements of the Port Corporation's Environmental Management Plan as these relate to their operations. Procedures will be developed by Territory Iron to address unloading of rail wagons and management of the product stockpiles.
Cultural Environment (PER Section 8.12)	
8.12.2a	An archaeological study of the Haul Route section from the mine to Roney siding will be completed before commencement of new road construction.
8.12.2b	All employees and contractors will be required to participate in a general site induction before starting work. The induction will include: - Information on the importance of the cultural environment and protecting artefacts and archaeological sites. - Information on the correct procedure if items of potential Aboriginal or heritage significance (including bones) are discovered during construction or mining activities.
8.12.2c	The coordinates of artefact and archaeological site locations shall be stored in a suitable database by Territory Iron and be made assessable to project design, construction and operations personnel.
8.12.2d	Archaeological sites close to disturbances (e.g. Ochre Hill 2 and 3) will be fenced off to protect them during operations.
8.12.2e	The Northern Land Council and owners of the pastoral stations will be kept informed of planned operations.
8.12.2f	Immediately advising the Northern Land Council, Aboriginal Areas Protection Authority (AAPA) and NRETA if an Aboriginal site or Aboriginal artefact is discovered.
8.12.2g	No archaeological site will be disturbed unless approval has been obtained from AAPA, Northern Land Council and/or NRETA.
8.12.2h	No isolated artefacts will be disturbed without approval from Territory Iron Operations Manager.
8.12.2i	Mining shall not commence until the AAPA Authority Certificate has been obtained. All conditions attached to the certificate shall be complied with.
8.12.2j	Territory Iron shall consider all applications for employment from the local indigenous population and in consultation with local Aboriginal groups shall investigate opportunities to provide assistance in training and mentoring.
Socio-Economic Environment (PER Section 8.13)	
8.13.2a	On final decommissioning plant and infrastructure will be dismantled, made safe and unless requested otherwise by project stakeholders, removed from the site.
8.13.2b	Compensation agreements will be reached with landowners for loss of use of land used by Territory Iron Limited for mining or associated infrastructure.

Commitment Number	Commitment
8.13.2c	Employment opportunities will be advertised locally and preference will be given to local candidates.
8.13.2d	Provision of goods and services will be advertised locally and preference will be given to local businesses.
8.13.2e	First aid facilities will be established onsite for the duration of the project. These facilities will be manned by appropriately qualified employees.
8.13.2f	A liaison will be established between onsite Emergency Response and First Aid personnel and providers of equivalent services in Pine Creek, Katherine and Darwin.
Biting Insects (PER Section 8.15)	
8.15.2a	During the site specific induction all employees will be advised of the potential for seasonal problems relating to biting insects including their pest and nuisance potential and disease carrying potential. All employees will be made aware of the diseases mosquitoes may carry.
8.15.2b	During site specific inductions, all staff will be advised on personal protection measures to protect themselves from mosquitoes and other biting insects.
8.15.2c	If mosquito breeding reaches significant levels, Territory Iron will liaise with the MEB to determine appropriate larvicides to use to control the problem.
8.15.2d	After the 12 month adult biting insect trapping program, Territory Iron will review the findings and recommendations of the report produced by the MEB and decide on appropriate management responses.
8.15.2e	Where employees are sourced or returning from countries or areas where malaria is endemic these employees shall be screened for malaria prior to entering the mine site.
8.15.2f	Monitoring and control of biting insects shall be included as part of the Environmental Management Plan.
Rehabilitation and Closure (PER Section 10)	
10a	As part of obtaining all permissions necessary to commence mining, Territory Iron will submit to DPIFM a security bond in case of any unplanned failure of the project. The size of this security bond will be regularly reviewed in conjunction with DPIFM to ensure it remains consistent with the level of disturbance caused by the project at any specific time.
10b	Annual monitoring will establish the effectiveness of rehabilitation. Monitoring will consider physical stability, erosion, minimisation, vegetation establishment (species diversity, density, cover) and weed presence.
10.2.4a	Infrastructure will be removed from the site as it becomes redundant. This will include administrative offices, workshops, fuel storage tanks, generators, water diversion structures, power lines and water pipes.
10.2.4b	Seed will be applied to ripped surfaces if natural revegetation has not established satisfactorily within two years of rehabilitation.

Commitment Number	Commitment
10.3a	Territory Iron Limited will prepare a Closure Plan within the first year of operations. The Closure Plan will be reviewed every three years. Implementation of the Closure Plan will be based on results derived from progressive rehabilitation activities. This will involve identifying post-closure impacts, develop and implement inspection and monitoring programs to verify acceptable performance, and develop and implement corrective actions plans, as appropriate.
10.3b	On final decommissioning, plant and infrastructure will be dismantled, made safe and removed from the site. Infrastructure such as bores and roads will not be decommissioned if post-mining land users request their retention.
10.3c	An assessment of the heritage value of the old rail corridor/haul route will be undertaken at the time of closure before any demolition of the historic railway formation is undertaken.
Risk Management (PER Section 11)	
11a	As part of the design, construct and operate contracts let by Territory Iron for the ore processing and mining, HAZOP style risk assessments will be conducted for operational aspects. Results of these assessments will be used to minimise risk for the project.
11.2a	Territory Iron will develop and maintain a suitably qualified and trained Emergency Response Team for the duration of the project.
11.2b	Training will be provided to all personnel identified within the Emergency Response Plan to ensure they understand their individual responsibilities with regard to implementation of the plan.
11.2c	First Aid kits will be maintained in all office buildings, light vehicles and mobile equipment.
11.2d	To minimise the risks associated with bushfire, firebreaks will be installed and maintained around key pieces of infrastructure.
11.2e	Fire extinguishers will be maintained in operational areas in accordance with regulatory requirements. Extinguishers will also be fitted in all light vehicles and mobile equipment.
11.2f	Mobile equipment such as water carts, graders and bulldozers will be used for fire suppression activities where necessary.

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FIGURES