

15.0 Social and Community Effects

15.1 Introduction

This section describes the social and community characteristics of the project area and assesses the likely impacts from the proposed open cut operation. An initial review of the existing cultural and socio-economic environment in the vicinity of MRM was undertaken by Charles Darwin University on behalf of Mt Isa Mines (MIM) (NTU, 2003). Since that time, the ownership of the mine has changed and the scale of the mine's proposals has reduced. For this reason, a revised assessment of the potential social and community impacts of the project has been undertaken.

15.2 Land Use and Land Tenure

15.2.1 The Gulf Region

The larger region within which the MRM mine site and Borroloola are located is commonly referred to as the Gulf Country or the Gulf Region, a sparsely populated area of Northern Australia. The region is variously named and delineated by different organisations, such as the Australian Bureau of Statistics (ABS), the Aboriginal and Torres Strait Islander Commission (ATSIC) and the Northern Land Council (NLC).

The ABS defines the Gulf Statistical Local Area (SLA) covering 99,930 km² as extending from Ngukurr on the Roper River in the north, to the Queensland border in the east, and between about 100 to 200 km inland. The ATSIC Katherine Region/Garrak-Jarru Regional Council defines the Gulf Region to cover the whole of the lower Top End from the Queensland to Western Australian borders. For the purpose of this EIS, all baseline socio-economic and demographic data are based on the ABS Gulf SLA, with the exception of information on Aboriginal communities which is based on the ATSIC Katherine Region/Garrak-Jarru Regional Council's description.

The Gulf Region can generally be considered in terms of three separate areas:

- **Northern Gulf Region** comprising the Roper River catchment south to about the Cox River, and centred on Ngukurr.
- **Central Gulf Region** extending from the Cox River to the Robinson River and the Garawa Aboriginal Land Trust, containing the MRM site, and the service centre of Borroloola.
- **Eastern Gulf Region** from the Robinson River to the Queensland border, serviced primarily by Borroloola, but also with linkages to Queensland regional centres of Bourketown and Mt Isa.

These subdivisions are roughly consistent with the human geography of the Gulf Region which consists of clusters of communities, each with its own administrative and commercial focus and rather different orientations and connections to major centres beyond the Gulf.

15.2.2 Historical Tenure and Land Use

The rich coastal, marine and riverine environments of the Gulf Region have historically supported comparatively large populations of Aboriginal people. Many Aboriginal residents of the region continue to value traditional culture, which includes strong attachments to land, sites and customary land management practices. The latter include patterns of foraging for food and other bush resources as a positively-valued element of local Aboriginal household economy.

Cattle were first introduced to the Gulf Region in 1869. The first station to be established in the region was Bauhinia Downs in 1883, followed by McArthur River Station in 1884, with many others established in the 1890s and early 1900s. In 1885, McArthur River Station was stocked with 1,600 head of cattle.

Aboriginal people now own many properties, either as a pastoral lease or as inalienable freehold.

The residential distributions and cultural identities of the contemporary Aboriginal population of the Gulf Region are complex, and have been strongly influenced by the history of European contact, settlement, commercial development and governance of the region. The current Aboriginal population of the Gulf Region includes groups with strong traditional ties to country in and adjacent to the MRM lease area, as well as groups who have moved into the area from other regions.

15.2.3 Current Land Tenure

Land tenures provide a broad indication of land usages within the region. There are two broad categories of tenure in the Gulf Region:

- Crown Lands which include:
 - Pastoral Leases.
 - Crown Leases, for purposes other than pastoral, e.g. Aboriginal Community Living Areas on pastoral leases, multi-purpose usage or land held by the NT Land Corporation.
 - Vacant Crown Lands.
- Freehold Lands which include:
 - Aboriginal Freehold. Land granted under Federal or Territory legislation to Aboriginal owners.
 - Normal freehold, e.g. private land within Borroloola township.

Within Borroloola township there is a combination of freehold, Aboriginal freehold, Crown leases and some vacant Crown land.

In descending order of extent, the eight forms of land tenure within the Gulf SLA are listed in Table 15.1

Table 15.1

Land Tenure in the Gulf SLA

Tenure	Area (km ²)	Percent of Gulf SLA (%)
Pastoral Leases	52,002	52
Commonwealth Freehold	37,502	37.5
Crown Lease Perpetual	9,270	9.3
Vacant Crown Land	262	0.3
Northern Territory Freehold	254	0.3
Permanent Pastoral Lease	122	0.1
Crown Lease Term	68	0.07
Special Purpose Lease	2	0.002

The two major forms of land tenure, both in terms of the number of portions and the area of land involved, are Pastoral Leases and Aboriginal land held under Commonwealth Freehold granted under the *Aboriginal Land Rights Act 1976* (ALRA). Within the Gulf Region there are 23 Pastoral Leases and 13 Aboriginal Land Trusts on Commonwealth Freehold returned to Aboriginal Traditional Owners under the ALRA.

In all, Aboriginal land held by recognised Aboriginal organisations under Commonwealth or Northern Territory (NT) title comprises approximately 38,451 km², or 38.5% of the total Gulf SLA.

The majority of lands in the Gulf not currently held as Aboriginal lands under Commonwealth or NT legislation, are currently subject to land claims by Aboriginal people under the ALRA or the *Native Title Act 1993*. These claims include a number of native title claims to the MRM site and surrounding country by various Gurdanji, Garawa and Yanyuwa claimant groups. None of these claims have yet reached mediation stage although registration and notification had been completed. MRM is aware of the claims and has had frequent interactions with many of the claimants although no actual native title discussions have yet occurred.

The existing leases at MRM are discussed in Section 1.7.

15.2.4 Pastoral Industry

The Gulf Region is similar to areas of the Cape York and Kimberley Regions in terms of its poor soil fertility and low stock carrying capacity. Grazing country is highly variable throughout due to a large variety of soil types. Good country is generally used for fattening while poorer areas are utilised for breeding.

While breeding is an important earner for producers in the Gulf Region, supplying cattle to the live export trade has been growing in significance, with the proportion of properties participating more than doubling between 1996 and 1997 (Tropical Savannas CRC, 2004). Northern Territory producers usually export live cattle out of Darwin. Numbers of live cattle exported from the Gulf Region are expected to rise in the

future. Cattle turn off to domestic store markets, or to affiliated properties of corporately owned enterprises, is a major income for pastoralists in this region.

Pastoral leases occupy 52% of the total land tenure in the Gulf Region. Nonetheless, due to reasons ranging from remoteness to the poor quality of grass in the region, less than 20 properties in the Gulf Region operate at their full potential. Other properties may occasionally muster feral cattle for sale to the Katherine meatworks (Tropical Savannas CRC, 2004). There were 52,808 head of cattle in the Gulf Region in 2002.

The pastoral industry in the Northern Territory added \$191 million to the economy in 2001 (DBIRD, 2002). Data were not available for the Gulf as a disaggregated region.

15.2.5 McArthur River Station

MIM acquired the McArthur River Pastoral Lease in 1976 and the Tawallah and Bing Bong pastoral leases in 1978. The leases were combined and now exist as the McArthur River station. The property lease is 100% owned by Colinta Holdings Pty Ltd, an Xstrata subsidiary.

The current and proposed mining operation is located on the McArthur River station pastoral lease (PPL 1051). The Bing Bong port facility is situated on mineral lease N1126.

McArthur River station currently stocks approximately 13,000 head of cattle over approximately 7,200 km². The majority of the cattle are grazed on the original McArthur River station pastoral lease (PL 860), which is the southern portion of the present lease. The most productive areas are the river flats associated with the upper McArthur and Kilgour Rivers.

The station is currently utilising approximately one third of the total pastoral lease for grazing and is stocked below the recommended stocking capacity of 17,000. The north-eastern section of the station is not utilised to its full capacity. This section is currently used on an ad-hoc basis to hold and fatten cattle before trucking. Cattle have been excluded from the mining and processing areas, and also from the Caranbirini Conservation Reserve.

Cattle grazing is limited to the lower open grassy plains where feed and water are accessible. The upper escarpments and plateau regions where spinifex tussocks dominate the land cover are generally free of cattle. The north-eastern coastal region where saline coastal flats and tidal rivers dominate are also generally free of cattle.

PPL 1051 contains 11 excision properties (for a variety of users including traditional owners, Telstra, King Ash Bay Fishing Club, and Batten Creek landing) and the Caranbirini Conservation Reserve which came into existence by means of a section 74 Agreement under the *Territory Parks and Wildlife Conservation Act 2000*.

15.2.6 Mining and Extractive Industry

Mining in the Northern Territory had increased in importance from 24.4% of Gross State Product in 1991/92 to 31.4% by 2001/02, but dropped to 23% in 2002/03. The total value of production in 2001/02 was \$3.2 billion and \$2.32 billion in 2002/03. It is estimated the industry employed an average of 4,622 workers in 2003/04 (including fly-in/fly-out workers from interstate).

In 2001/02 more than \$218 million was spent on mineral exploration in the Northern Territory (DBIRD, 2002). Due to confidentiality agreements, exploration figures for the Gulf Region are not available.

A number of exploration licences have been granted in the Gulf Region but to date MRM is the only mine to begin production. Striker Resources is in advanced exploration with the Merlin Diamond Project in the McArthur Basin.

Mineral leases in the southern part of McArthur River station, particularly the Abner Range and upper Glyde River are prospective for diamonds, and at least two companies other than Xstrata are actively exploring these areas. The Merlin diamond mine, at Boomerang Creek (a tributary of the upper Glyde River) produced 468,000 carats before ceasing production in 2003 (Australian Mining Atlas, 2005).

15.3 Existing Social and Community Trends

15.3.1 Demographic Profile of the Gulf Region

The data presented in this section are drawn from the Australian Bureau of Statistics 2001 population census for the Gulf SLA (ABS, 2002).

The 2001 census indicated that there were 3,482 people in the Gulf SLA (2,013 males or 57.8% and 1,469 females or 42.2%), including 13 overseas visitors. This represents an increase of 20.9% since the 1996 census and 36.6% since the 1991 census.

A total of 2,341 people (67.5%) identified as indigenous Australians in 2001 (1,229 males and 1,112 females), a 9.8% increase since the 1996 census and 26% increase since the 1991 census. However, the indigenous population as a proportion of the total population declined from 74.2% in 1996 (2,132 people) and 73.1% in 1991 (1,858 people).

The increase in the overall population since the 1996 and 1991 censuses has been greater among the non-indigenous sector of the population. The increase in the non-indigenous population of the Gulf SLA can reasonably be attributed in part to the development of MRM and its impact on the development of Borroloola.

The Gulf SLA population is relatively young. A quarter of the population (26.4%) is aged below 15 years, and 54% are aged below 30 years. However, the median age of the population has increased, from 22 years in 1991 to 23 in 1996 and 28 years in 2001.

Excluding overseas visitors, in 2001 3,047 people (87.9%) stated that they were Australian born, a decline from the proportions recorded in 1991 (95.1%) and 1996 (93.9%). The number of people recorded as born overseas in 2001 was 114 (3.3%). Of these, 39 or 34.2% were recorded in the two major centres of Borroloola.

The indigenous population is comparatively younger than the overall Gulf population, with 34.3% of the indigenous population aged below 15 years, against 7.2% of the non-indigenous population (or 26.5% of the total Gulf population). The sex ratio is also closer to equality among the indigenous sector of the population: 52.5% males, 47.5% females, against 65.4% males and 34.6% females in the non-indigenous sector of the population.

These differences in age and sex structure of the indigenous and non-indigenous sectors of the population can reasonably be attributed as an impact of the existing MRM operations. For example, 95 (87.2%) of the population in the MRM census division are male. If the figures for this census division are excluded, the overall sex ratio in the population approaches the ratio in the indigenous population as a whole, at 56.8% male, 43.2% female.

15.3.2 Population Distribution and Lifestyle

The Gulf Region is sparsely settled and minimally served by urban centres. There are only two gazetted towns in the region:

- Borroloola, which is the main service centre; and
- The town of Pellew on Centre Island off the mouth of the McArthur River, which has been set aside for future port development.

Ludwig Leichhardt first sited the present site of Borroloola in 1845 but it was not for another 30 years that the first pastoralists made use of the area. By 1887 the town had grown to house a courthouse, police stations, two hotels, a butcher's shop and a general store. The town grew to have a frontier town reputation and became a popular service centre for drovers driving their cattle between Queensland and Western Australia.

Today, Borroloola is still a significant centre for the surrounding cattle stations. Tourism has also become an important aspect of the town and the region. Tourism focuses on natural features such as wildlife, bush walking, four-wheel driving, and excellent fishing including the Borroloola fishing classic held at King Ash Bay.

There are many Aboriginal communities widely scattered across the region in Aboriginal Community Living Areas excised from pastoral leases, including some excised from the MRM mining leases, and as community centres and outstations located on Aboriginal lands.

Pastoral homesteads, roadhouses, motels and camp grounds, and the MRM accommodation facilities represent the other principal population centres. In general, people live in the Central Gulf Region because they enjoy a remote lifestyle. This also applies to a few MRM staff who live permanently at the

mine site (4 staff with 5 dependants), while the majority of the mine workforce works on a fly-in/fly-out roster and is permanently domiciled elsewhere.

The non-Aboriginal population is mainly concentrated in Borrooloola and scattered pastoral homesteads, roadhouses, other minor enterprises (fishing, tourism etc.). The King Ash Bay fishing centre is becoming increasingly popular with tourists, especially retired people. In the off-season, it is a small centre, consisting of caravan parks, camping grounds and a shop, with a few permanent residents maintaining it year-round. In high season, however, it becomes a bustling holiday centre, reputed to have up to 1,000 residents. An increasing number of people are investing in long-term leases at King Ash Bay.

Future development in Borrooloola is somewhat restricted as most land within the town boundary is vacant crown land. There are only a few blocks of freehold land for sale. Vacant crown land can become available for purchase by submitting a plan to Government for assessment explaining the need for the land. Occupational leases for business enterprises on blocks of land may be acquired through the same process.

Land for housing in Borrooloola is limited. It is constrained by the floodplains of the McArthur River and Rocky Creek, the black soil plain which is unsuitable for sewerage systems, and the other parts of the town area which are extremely rocky. The area New Subdivision has about 30 blocks of land that have not been released by the Government.

15.3.3 Economics and Employment

The total workforce of the Gulf Region is 1,276 (818 males and 458 females). Indigenous people make up 59.8% of the total labour force (450 males, 313 females). The unequal sex ratio is mainly attributable to the preponderance of males in the workforce in the MRM census division. The unemployment rate for the Gulf as a whole is 4.7% of the total workforce, for indigenous people 6.3%, and for non-indigenous people, 2.4%. Again, the overall figures are skewed by the special characteristics of the MRM census division, where all adult residents are employed. Unemployment figures for 1996 and 1991 were 4.4% and 16.3% respectively. For the Northern Territory as a whole, the unemployment rate in 2001 was 5.9%, down from 7.4% in 1996.

The largest single employment category in the Gulf Region is the Community Development Employment Program (CDEP), employing 675 people or 52.9% of the total workforce. Of the total indigenous labour force, 637 or 83.5% are employed under the CDEP, and only 78 or 10.2% are employed in other categories of the labour force. The corresponding figures for the non-indigenous labour force are 38 or 7.5% employed under CDEP and 90.1% employed in other categories. There is an ongoing debate about whether CDEP numbers should be included in either the welfare or employment categories. If CDEP positions were considered as welfare rather than employment, the Aboriginal employment figures would be significantly lower, and would indicate a greater need for increased employment opportunities.

Local employment and training opportunities, together with transportation and provision of services, are the most important economic benefits for the local community from the existing MRM operations. MRM has also had a positive input into local community development in terms of health development, general

and specialised education, financial services, and employment. MRM has also entered into a business arrangement with the local Aboriginal corporation (MAWA).

15.3.4 Education

The following four Government schools operate in Gulf Region towns and communities:

- Ngukurr Community Education Centre;
- Minyerri School;
- Borroloola Community Education Centre; and
- Robinson River.

The first two are located in the Northern Gulf area and therefore not in the immediate vicinity of the MRM operation, whereas Borroloola is nearby and Robinson River is also in the Central Gulf Region.

The Borroloola Community Education Centre offers primary and secondary schooling up to year 10 externally, while the other schools in the region are primary only.

The number of people attending an education institution in the region from the 2001 census is given in Table 15.2. The lower proportion of enrolments in Borroloola from secondary school on suggests that students are leaving school early or moving to a different region to continue their schooling.

Table 15.2

Education Enrolments 2001 Census

Educational Institution	Students Enrolled in the Region	Students Enrolled in Borroloola
Pre-school	32	12
Primary school	251	101
Secondary school (external)	89	26
Technical or further education	17	3
University or other tertiary	27	9
Other	633	125

There is limited opportunity for tertiary or vocational training in the region. The nearest regional centre for the Northern Territory University and TAFE is located in Katherine. Some studies can be completed externally through these institutions.

MRM has implemented a program to enhance local employment and training. The Structured Training and Employment Program (STEP) aims to increase the number of indigenous people employed in the minerals industry. It is MRM's policy to employ local people where possible, providing they have suitable skills. STEP provides valuable skills in a region where there is no immediate access to tertiary or vocational training. Upon completion of the program, participants have the opportunity to take up work at MRM or pursue employment in other areas having gained considerable skills and work experience with the program. From 2000 to 2002, STEP had 19 participants, all local Aboriginal people. Nine of the 19

completed the program and obtained full-time employment with MRM. Six of these nine stayed on at the mine, while the remaining three moved on to other opportunities, an indication that the program had provided transferable skills.

15.3.5 MRM Partnerships

MRM has been active in pursuing partnerships and agreements with community and government counterparts on matters of community development. For example, a three-year Memorandum of Understanding (MOU) on co-operation in education and training was signed in March 2002 between the NT Government (Department of Employment, Education and Training and the Borroloola Community Education Centre), the mine and the residents of Borroloola. The MOU is aimed at creating skills and career opportunities for residents of Borroloola to improve the scope of education and post-education outcomes for students at Borroloola.

MRM provides logistical support and sponsorship to the NT Minerals Council Education Committee for annual classroom visits to the Borroloola and Robinson River schools which promote minerals awareness and education to the students. The company also supports hearing impaired students from the Borroloola and Robinson River communities with sponsorship of visits by special teachers of the deaf from Alice Springs.

In September 2004, MRM renewed an MOU with the NT Chamber of Commerce for another two years for the provision of quality-assured training programs at the mine. MRM stated in the MOU that it “is committed to assisting the local community in maximising local employment and local involvement in the Mining Industry”. The effect of the MOU will be that any training received under the MOU at MRM will be nationally-recognised and therefore transportable, a great benefit for those Borroloola people who obtain certification.

15.3.6 Health

There are no public hospitals in the Gulf Region. The community health centre at Borroloola provides basic public health services. There is also a doctor with his own general practice in Borroloola. A small variety of specialists visit the region occasionally throughout the year.

A dentist visits Borroloola approximately every three months. For specialist treatment, patients are recommended to specialists, with Katherine being the nearest centre.

Borroloola and Ngukurr police stations are the centres for emergency services in the area. MRM supports an ambulance service for Borroloola and also assists with some medical evacuations.

There are a number of small airports in the case of severe medical emergencies, but most situations can be dealt with locally.

15.3.7 Transportation Services

Major all-weather sealed road access to the Gulf Region is mainly oriented east-west. The Roper Highway connects Urapunga and Ngukurr to the Stuart Highway at Mataranka, and the Carpentaria Highway connects the McArthur River Mine and Borroloola to the Stuart Highway at Daly Waters. The only other major sealed access route connecting the Gulf Region to other parts of the Northern Territory is the Tablelands Highway. It runs south from its junction with the Carpentaria Highway approximately 15 km west of McArthur River Homestead to meet the Barkly Highway running between Three Ways/Tennant Creek and Camooweal and Mt Isa in Queensland.

As a consequence of the location of major regional centres outside the Gulf Region (notably Katherine and Tennant Creek), and the orientation of major roads in the Gulf Region, wider linkages of the Northern Gulf subregion are oriented primarily towards Katherine. The Northern Gulf subregion is poorly linked to the Central and Eastern Gulf subregions. There are no major all-weather roads connecting the three subregions of the Gulf, thus potentially limiting access of scattered communities to public facilities. Even major sealed roads are subject to road closures from flooding, sometimes lasting several weeks during the wet season.

There are several licensed airstrips in the Gulf Region servicing major centres. In addition, there are many airstrips on private land. These airstrips meet only very basic standards, are not inspected by Aviation authorities, and there is no official listing of their location. However, these minor airstrips provide a valuable network connecting pastoral homesteads and Aboriginal communities to regional centres, especially during the wet season when many roads become impassable. There is a licensed aerodrome with refuelling facilities at Borroloola and many small private airstrips on pastoral properties.

15.3.8 Recreation and Tourism

Tourism is an important aspect of the Northern Territory economy. Compared to 2002/03, total visitor numbers to the NT in 2003/04 declined 10% (down to 1.5 million people) and total visitor nights fell by 19% (down to 7.7 million nights). However, visitor spending increased by 8% (to \$8.2 billion), injecting an additional \$81 million into the NT economy.

The Katherine tourist region, which incorporates the Gulf Region (including Borroloola), recorded an increase in visitor numbers of 35% in 2002 but a decrease of 33% in 2003/04. There were no disaggregated figures for the Gulf Region. The decline in the Katherine Region was primarily due to fewer intra-Territory and interstate visitors after high numbers were recorded in 2002/03. International holiday visitation continued to decline (30,000 visitors).

The Gulf Region attracts many visitors wishing to enjoy the area's natural attractions and colourful past. Barranyi National Park, Caranbirini Conservation Reserve, and the area known as "The Lost City" attract visitors with their natural formations and untouched wilderness appeal. Nathan River Station, still in the developmental stage, has been announced as a new national park. The Borroloola museum offers an insight into the region's history.

Fishing is an important aspect of the Gulf Region's tourism as well as a favourite pastime for locals. The King Ash Bay fishing classic at Easter is a highlight. MRM has recently built a house at King Ash Bay for recreational use by mine staff.

There is a sports club in Borroloola as well as a rodeo and gymkhana club, a youth centre, a fishing club, and multi-purpose tennis courts.

15.3.9 Current Visual Amenity

Most of the existing MRM mine facilities are set back from the Carpentaria Highway, with the primary mining and processing operations situated over 2 km away. The one exception to this is the existing tailings storage facility which is located 200 m to the west of the highway. The raised perimeter of this facility is visible from the roadside.

The Bukalara Plateau, to the east of the mine site, stands approximately 30-100 m above the surrounding countryside and provides a natural backdrop to the mining operations. This, combined with the underground nature of the current mining operation, ensures that the mine does not dominate the visual landscape of the area.

The mine is situated in a sparsely populated area of the Gulf Region, and is well removed from the nearest residential area at Borroloola approximately 45 km to the north-east. Other than the Carpentaria Highway, there are no significant public viewpoints where the mine can be seen from.

15.4 Social and Community Effects

15.4.1 Construction Phase

The construction phase will extend over a two-year period and the construction workforce will peak at approximately 150. This workforce will include construction labour, suppliers, consultants, owner's team and other contractors. The majority of the workforce will be a mixture of skilled, technical and semi-skilled workers with the balance being professional personnel.

It is envisaged that the majority of the construction workforce will be male and between 25-55 years of age. However, MRM is an equal opportunity employment site and some female construction workers are expected. This labour profile is comparable with the labour forces of other industrial developments in the Northern Territory and interstate. In general, construction work will be available for single status workers only. The expected skill base necessary for the construction workforce is shown in Table 15.3.

Table 15.3

Construction Workforce Skill Needs

Professionals	Technical	Skilled	Semi-skilled
Civil Engineers	Mechanical trades	Equipment Operators	Security personnel
Mechanical Engineers	Electrical trades	Builders and Concreters	Trades assistants
Structural Engineers	Drafters	Form workers	Labourers
Surveyors	Administration	Drivers	
EHS Specialists		Fitters and Machinists	
Legal and financial		Metal fabrication workers	

It is not possible at this stage to accurately predict the number of workers who may be involved in construction. An account of possible positions, shifts, staff structures and responsibilities is even more difficult to predict until the primary construction contractor has been selected and has completed an assessment of all aspects associated with implementing the proposed design of the open cut project.

As the construction workforce will generally be single status, the population increase at the mine site as a result of the imported construction workers will peak at 150. This will be a temporary effect and will only exist for the duration of the two-year (dry season) construction phase.

The majority of the construction workers will be employed on a fly-in/fly-out (FIFO) arrangement. They will fly in from Darwin, work at the mine site during their rostered time on, and then fly back to Darwin for their rostered time off. Consequently there will not be any significant impact on the demographics of Borroloola or any other local communities.

It is possible that a number of appropriately skilled construction workers may be recruited from the local area. If so, it is anticipated that virtually all of these local employees will already be resident in the area. Hence, this will not result in any local demographic changes.

In addition to the direct construction employment, there will be additional indirect employment generated as a consequence of the project's construction. This occurs as a flow-on effect through other sectors of the economy which will provide goods and services to the project. Most of this will occur elsewhere in the Northern Territory or in other parts of Australia. As discussed in Section 17.4, construction will generate up to 140 indirect jobs in the Northern Territory and 420 nationally for each year of the construction phase.

15.4.2 Operations Phase

MRM currently employees 330 people on-site. This includes wages employees, salaried staff and contractors. The majority of these are employed on a FIFO basis with only four staff (with five dependents) living permanently on site.

Efficiencies to be obtained in changing from an underground to an open cut mining operation will result in the total on-site workforce reducing to 270. Consequently there will be a commensurate reduction in the resident population at MRM as a result.

The skills profile of the operational workforce is summarised in Table 15.4.

Table 15.4
Operational Workforce Requirements

Details	Mining	Metallurgy	Administration	Contractors	Totals
Managers and Administrators	1	1	1	5	8
Professionals	8	5	10	19	42
Associate Professionals	6	12	12	11	41
Tradespersons and Related Workers	2	19	3	40	64
Advanced Clerical and Service Workers	1	1	9	6	17
Intermediate Production and Transport Workers	3	21	8	34	66
Labourers and Related Workers	2	11	5	14	32
Total Numbers MRM Workforce	23	70	48	129	270

Any new employees required as a result of new skills required for the change from underground to open cut mining will be hired predominantly from Darwin or other regions where skilled labour is available. However, MRM is committed to hiring local people when appropriately skilled personnel are available, and will provide employment and training programs in order to train local people with the necessary skills.

Employment of local people will provide opportunities for people to diversify and boost their work skills. An increase of locally-employed people will increase the region's participation rate in the workforce and indirectly benefit the whole community through flow-on effects to other businesses in the region. Local employment opportunities may be enhanced due to the open cut operation requiring a different level of skills for some workers when compared to the existing underground operations.

It is anticipated that any local people who are employed at the mine will already be resident in the area. Hence, there will not be any local demographic changes.

As discussed in Section 17.4, the open cut operation will generate flow-on effects through other sectors of the economy, including employment. Most of this will occur elsewhere in the Northern Territory or in other parts of Australia. However, flow-on effects from the open cut operation will not be as great as that currently resulting from the underground operation.

15.4.3 Accommodation

Construction Phase

The construction workforce will be accommodated in a purpose-built camp to be located adjacent to existing accommodation facilities. Further details are provided in Section 5.2.

Operational Phase

The existing on-site accommodation camp will be used for the operational workforce of the open cut mine. This consists of self-contained accommodation units, communal dining facilities and recreational facilities. As the on-site employment will reduce with the open cut project, no new accommodation facilities will be required.

As discussed in Section 15.4.2, the open cut operation will not have any effects on the demography of Borrooloola and hence there will also be no impacts on Borrooloola's accommodation facilities.

15.4.4 Education Effects

There will be no direct need for additional school facilities as a result of the open cut project as the mine's workforce will be single status employees on a FIFO roster. Consequently there will be no accompanying children requiring educational facilities.

As discussed above, MRM is committed to hiring local people and provides employment and training programs to train local people with the necessary skills. These training programs will continue following the commencement of open cut operations. Any increase in vocational employment will boost the skills and earning potential of residents in the region. With the opportunity for vocational work there may also be a positive effect on school enrolments as students seek to improve their education to make themselves suitable to gain this type of employment.

15.4.5 Health Effects

The current level of health services in the region appears to serve the needs of the current population. There are a number of community health centres, a resident general practitioner, and visits to the area by dentists and specialists. As the population at the mine will not increase, MRM's existing medical facilities will be sufficient to cater for the mine's operational workforce. As the population of Borrooloola will not change due to the project, no additional demands on the local community health system are expected.

15.4.6 Recreation and Tourism Effects

Recreational fishing is the major recreational activity in the Borrooloola area. This activity will not be directly affected by the open cut project. Much of this activity is centred at King Ash Bay. This area will not be directly affected by the mine as it is well upstream (60 to 100 km). Furthermore, as discussed in

Section 12.9.1 there will be no indirect effects as the mine's water system will be managed so that there will be no deleterious downstream water quality impacts.

There is potential for mine employees to visit and possibly affect the amenity of local conservation reserves and tourist attractions such as Caranbarini Reserve and Bessie Springs. They could also generate increased fishing pressure at local fishing sites such as Eight Mile Waterhole and Catfish Hole, as well as increase in fishing in the lower McArthur River, based at King Ash Bay. However recreational opportunities for mine employees are limited because the FIFO work arrangements mean that workers' recreational time will be spent away from the site. Nevertheless, to further reduce any potential effects, it is proposed that all employees (both construction and operations) will be subject to a code of conduct which will include, amongst other things, controls on access to, and use of, regional recreational areas.

15.4.7 Visual Amenity

The main public viewing point of the open cut operations will be from the Carpentaria Highway. From this location the overburden emplacement facility and the tailings storage facility will be clearly visible. Other mine facilities will be less visible. An artist's impression of what the open cut mine will look like is given in Figure 15.1.

Overburden Emplacement Facility

The overburden emplacement facility (OEF) will be approximately 1.4 km to the east of the highway. Its western side will be approximately 1.4 km long and will face the highway. It will consist of 10 m high batters at slopes of 14° to 16° interspaced between horizontal berms 10-20 m wide. The top of the OEF will be 50 m above the original ground surface, which is less than the height of the adjacent Mount Stubbs which has a maximum height of 80 m.

The OEF will be gradually built up in stages over the life of the mine during which time it will resemble an active large scale earthmoving operation. As the lower berms and batters are completed, the outer batters will be recontoured as necessary and the berms will be rehabilitated using a process of topsoil addition, contour ripping, seeding and fertilising. In this way the visual appearance of the OEF from the highway will gradually change over the life of the mine from an active earthworks operation to a rocky embankment with vegetation growing along the berms.

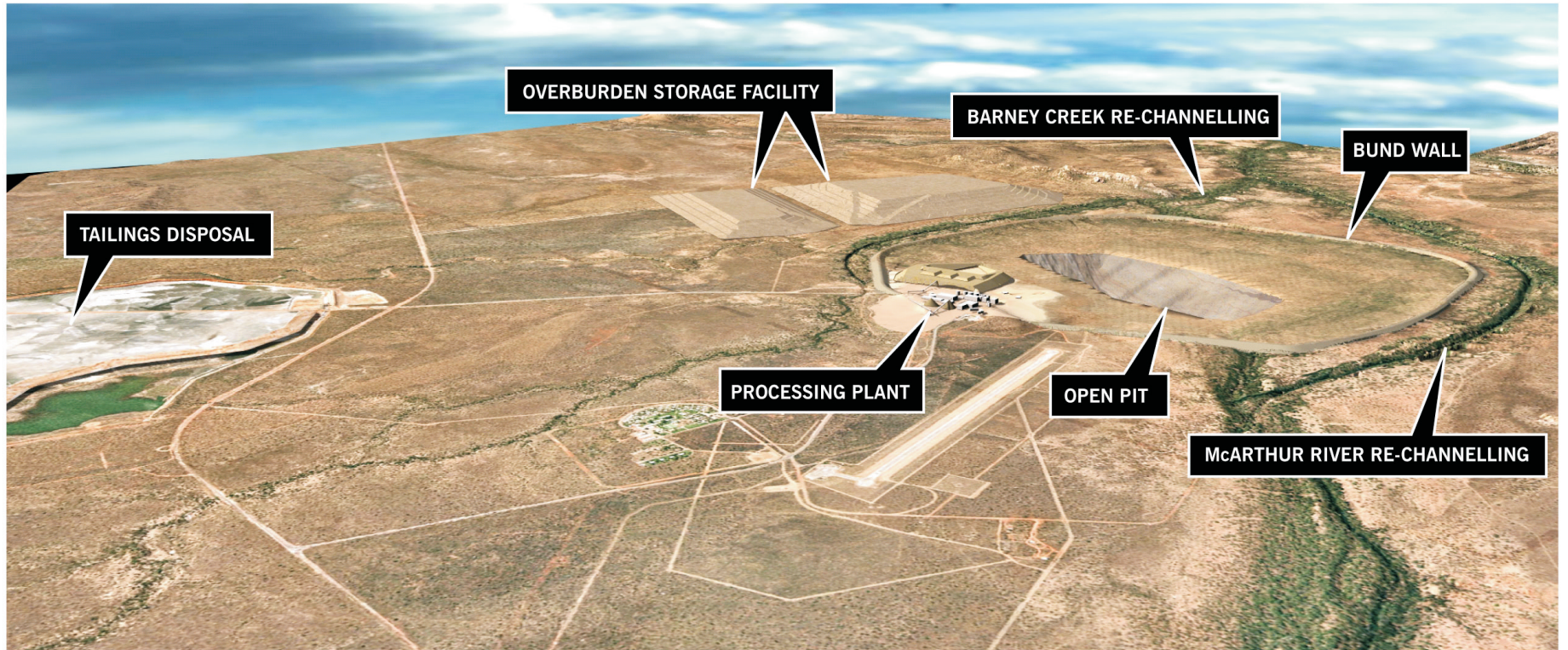
At a distance of 1.4 km from the highway, the OEF will occupy a relatively small portion of the field of view of a passing motorist. While it may act as a point of interest, it will not dominate the viewshed.

Tailings Storage Facility

The tailings storage facility (TSF) will be up to 200 m from the western side of the highway and will extend along it for approximately 2 km.

At its northern end is the existing TSF which will be decommissioned and rehabilitated once the new TSF is operational. This will result in its appearance changing from an active tailings disposal area to one which will be covered with soil and revegetated.

VIEW FROM SOUTH WEST



Drawn: VH
Job No.: 42625552

Approved: OMP
File No: 42625552-g-0300.odt
Date: 18-07-2005

McARTHUR RIVER MINE
OPEN CUT PROJECT
ENVIRONMENTAL IMPACT STATEMENT

Figure: 15.1

ARTIST'S IMPRESSION
OF OPEN CUT PROJECT

Rev. B
A4

On the eastern side of the new TSF facing the highway will be the perimeter embankment. This will be a rock fill structure with a side slope of 1:2 and with an average height of approximately 15 m. Over the life of the mine the height of the TSF will be increased by the addition of three additional 4 m high rock fill embankments, on top and behind the perimeter embankment. The final visual impression will be of a rock fill embankment approximately 27 m high. There will be a flat area in front of each of the three additional embankments that will be covered with topsoil and revegetated. This will result in vegetation growing in front of the rock fill embankments, which will provide a partial visual screen for views from the highway.

At the southern end of the TSF facing the highway will be the water management dam. The perimeter embankment around the dam will have the same visual appearance as described above but it will be approximately 7-8 m high and no additional embankments will be built on top of it.

Processing Plant

There will be no significant visual changes to the processing plant. The only additional features will be the construction of the ROM, primary crusher and related conveyor system adjacent to the existing plant area. These new facilities will be over 2 km to the east of the Carpentaria Highway and will visually blend in with the existing operations. They will have a similar appearance to the existing plant and those that will be visible will have the visual effect of increasing the extent of the industrial facilities in an existing industrial landscape. However most of the new facilities will be behind the flood protection bund and will be screened from highway views.

Open Pit and Flood Protection Bund

The open pit will not be visible from the Carpentaria Highway as it will be below ground, will be over 3 km away, and will be surrounded by a flood protection bund. If any glimpses are seen, the view will be of the flood protection bund which will be a rock fill embankment with a flat vegetated top. Along the western side of the pit facing the highway the bund height will vary from 8 to 18 m in height depending on the ground level. At a distance of over 2 km the bund will occupy a relatively small portion of the field of view of a passing motorist and will have a low visual impact.

McArthur River Realignment

The McArthur River realignment will not be visible from the Carpentaria Highway. It will be over 3 km away and will be on the opposite side of the river, screened by the existing riverine vegetation.

The realignment will be an engineered channel on the southern side of the flood levee bund around the open pit. Initially it will have exposed soil or rock bed, banks and surrounds. Artificial aquatic microhabitats (e.g. rocks, logs etc) will be placed randomly along the channel bed. The banks and surrounds will be vegetated following construction and will gradually assume a more natural character. The engineered appearance of the banks and bed will gradually attain a more natural look as water flows move sediment about under normal erosion and deposition processes.

15.4.8 Environmental Management Plan

A draft social and community environmental management plan for the open cut project is given in Section 22.4.