August 2008

KOOLANOOKA – BLUE HILLS DIRECT SHIPPING ORE (DSO) MINING PROJECT CLOSURE PLAN

Providing sustainable environmental strategies, management and monitoring solutions to industry and government.

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Midwest Corporation Limited

KOOLANOOKA / BLUE HILLS DIRECT SHIPPING IRON ORE (DSO) MINING PROJECT

CLOSURE PLAN

August 2008

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EXECUTIVE SUMMARY

Midwest Corporation Limited (Midwest) proposes the Koolanooka / Blue Hills Direct Shipping Iron Ore (DSO) Mining Project (the Project). The Koolanooka mine site is located approximately 160 km south east of Geraldton and 21 km east of Morawa, and the Blue Hills mine site is located 60 km to the east of Koolanooka.

The Project involves the recommencement of open pit mining activities at Koolanooka and at the Mungada East and Mungada West pits at Blue Hills. These mines were previously operated by the Geraldton Operations Joint Venture (GOJV) from 1966–1972 as Australia's first export iron ore mine. Most work will be conducted in existing disturbed areas.

Midwest is currently exporting previously mined material from stockpiles at Koolanooka at the rate of 1.0 Mtpa, through the Port of Geraldton. The operational workforce of approximately 50 will reside at Karara, Morawa and Geraldton, providing a significant economic benefit to the region.

This Closure Plan forms part of the documentation that will be submitted for environmental approval with the Koolanooka / Blue Hills Direct Shipping Iron Ore (DSO) Mining Project PER and Tilley Siding Stockpile Loading and Transport Facility ARI.

Site closure, either at the end of the mine life or running concurrently with mining activities is a critical component of mine management, and ensures there are no ongoing adverse impacts. By developing a closure plan as part of the planning stages of the project, Midwest is demonstrating that areas impacted by the project will be left in a condition acceptable to regulators, post-mining land users and the general public.

Planning for mine closure seeks to address the social, environmental, financial and safety aspects of mine closure. The aim is to prevent or minimise long-term environmental impacts and to create a self-sustaining natural ecosystem or alternate land use based on an agreed set of objectives (ANZMEC, 2000). In undertaking mine closure activities at areas impacted by the project, Midwest will fulfil the following objectives:

- Meet legislative requirements and ensure public safety;
- Avoid or minimise project related environmental and socio-economic impacts;
- Conduct effective consultation undertaken to enable stakeholders, including regulatory agencies, non-government organisations and other interested parties, to have their interests considered during the mine closure process;
- Re-establish landforms and vegetation communities to meet the agreed post-mining land use requirements;
- Establish stable landforms that are consistent with the surrounding area;
- Achieve closure completion criteria, as confirmed by monitoring, to allow for effective and complete relinquishment of tenements; and
- Fulfil all commitments in this Closure Plan.

1.0 PROJECT COMPONENTS

Detailed descriptions of project components are available in Koolanooka / Blue Hills Direct Shipping Iron Ore (DSO) Mining Project PER (Ecologia, 2008) and Tilley Siding Stockpile Loading and Transport Facility ARI (Ecologia, 2007b). A summary of the key project components is included in Sections 1.1, 1.2 and 1.3.

1.1 KOOLANOOKA MINE

- Expansion of the existing pit, including a minor footprint increase of 4.46 ha for the south fold cutback;
- Addition to and re-contouring of existing overburden stockpiles at Koolanooka, comprising two waste dumps on pre-disturbed area (38.2 ha);
- Crushing and screening facility to process the DSO deposits, on previously disturbed area;
- Power via diesel generators producing 500 –1000 kW, on previously disturbed areas;
- Bulk diesel storage areas to store 100, 000 L volume of fuel, on previously disturbed areas; and
- Portable offices, ablutions, workshop and a first aid facility, on previously disturbed areas (3.7 ha).

1.2 BLUE HILLS MINE

- Expansion of Mungada East and West Pits, including an increased area for overburden stockpiles. The total area of pit expansion on generally pre-disturbed land is 11.7 ha, area of new disturbance is 40.8 ha;
- Reinstatement of the existing haul road connecting the Mungada pits with Koolanooka. This will involve re-clearing an estimated 39.5 ha of previously disturbed vegetation 3 m wide on both sides of the road.
- A small accommodation camp at Karara homestead; and
- A small workshop to service the Blue Hills operation and portable offices, ablutions and a first aid facility (1 ha).

1.3 TILLEY SIDING

In addition to the mining developments listed above, a new ore transport facility will be developed at Tilley Siding to transfer ore from truck to rail. Tilley Siding is adjacent to the northern boundary of Morawa Townsite (Figure 1.1).

The Tilley Siding development is being undertaken through Mining Proposal number 5622. The closure of Tilley Siding will be managed as part of this Closure Plan.

Tilley Siding development comprises the following:

- Development of 1,610 m rail siding;
- Hard-stand areas and access tracks;
- Portable generators;
- Site office; and
- Temporary chemical toilet.

1.4 SCOPE OF CLOSURE PLAN

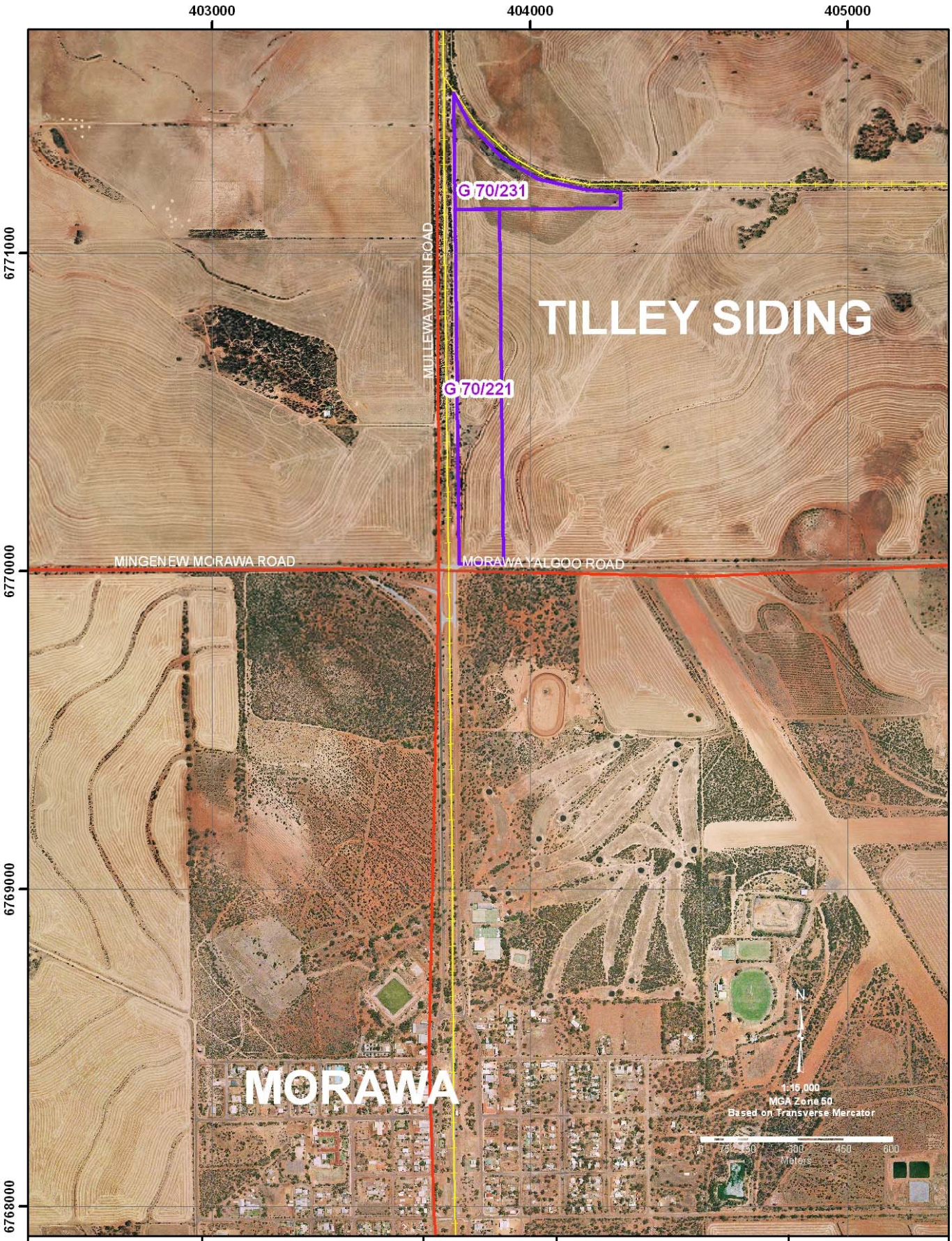
The Koolanooka / Blue Hills DSO Mining Project Closure Plan comprises the following:

- Closure issues related to the infrastructure and activities incorporated with the mining, processing, and transport of DSO at Koolanooka and Blue Hills; and
- Closure issues related to the infrastructure and activities of Mining proposal number 5622 at Tilley Siding.

The aim of this Closure Plan is to provide a strategic planning framework for the closure of Midwest's Koolanooka / Blue Hills DSO Mining Project by:

- Identifying those aspects relating to decommissioning and closure which may impact on the environment, health and safety;
- Providing a basis for consultation with responsible authorities and identified stakeholders regarding the post-mining land uses of the project area and the development of agreed completion criteria;
- Developing management strategies to be implemented as part of the project's design, construction and operation to minimise impacts and site closure requirements;
- Identifying closure costs to establish adequate financial provisions; and
- Providing details of the management strategies to be implemented by Midwest to the appropriate responsible authorities and the community to confirm completion criteria are met.

This closure plan will be reviewed throughout the life of the project (3 to 5 years) to consider changes in site conditions, operations, technology and community expectations.



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Author: BSM

Legend

Railway — Tenements

Roads

Midwest Corporation Limited

Tilley Siding Dust EMP

Tilley Siding Project Area

Date: 14/6/2007

Scale: 1:15,000

Figure: 1.1

Project ID: 813

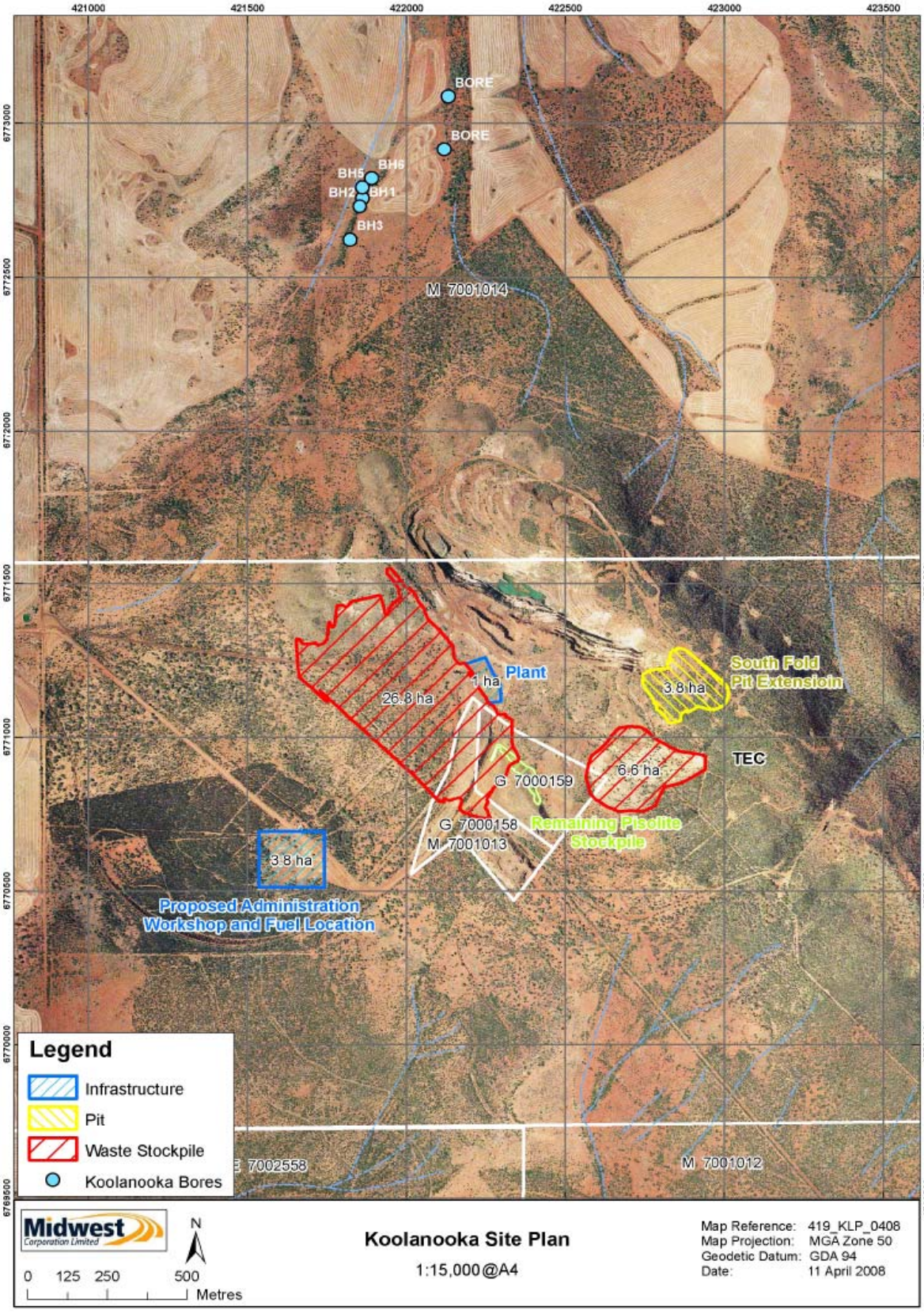
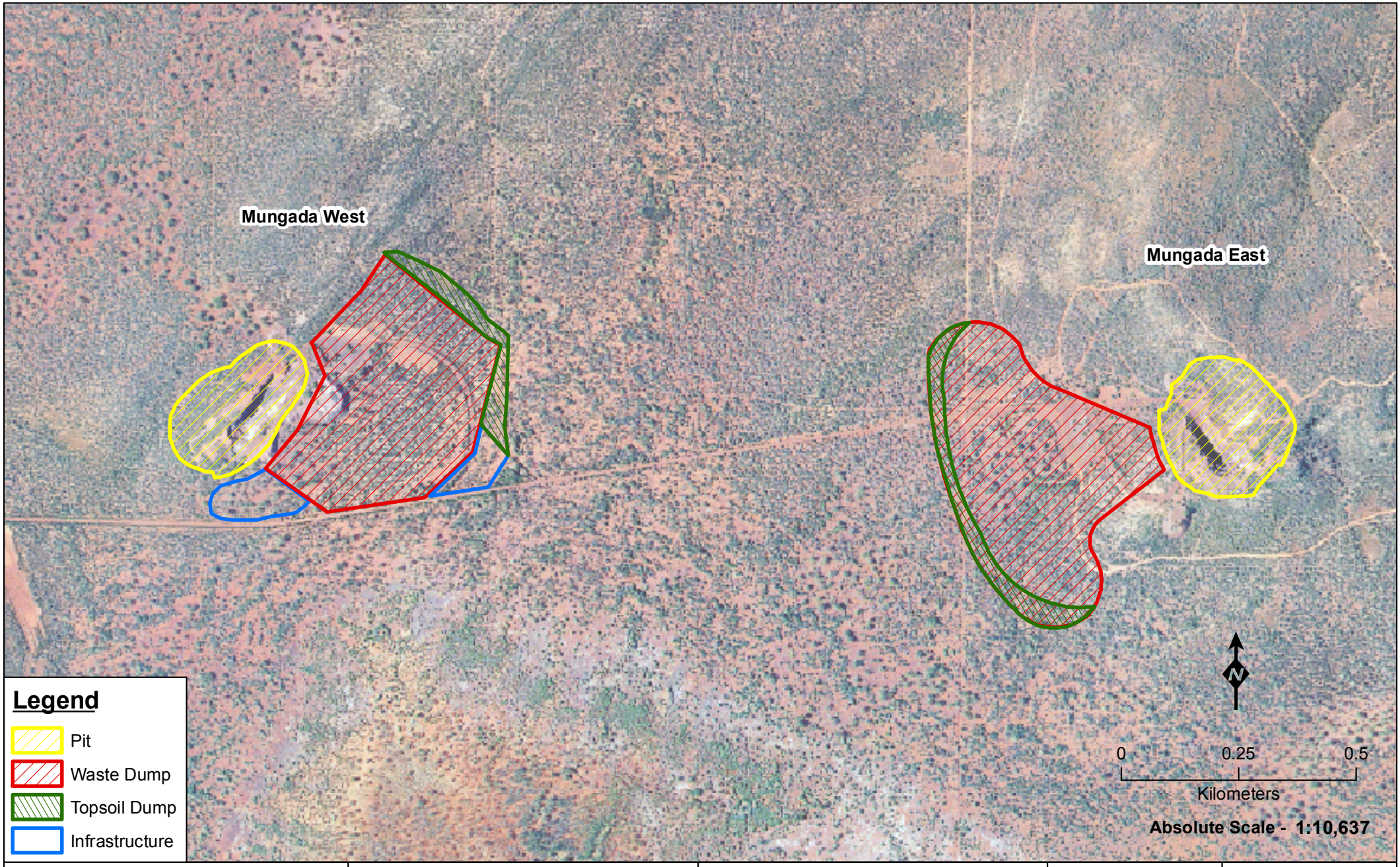


Figure 1.2: Koolanooka project area.



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Midwest Corporation Limited

Blue Hills Project Area

Figure:
Project ID:

Drawn: SG
Date: 24/09/08

Coordinate System
Name: GDA 1994 MGA Zone 50
Projection: Transverse Mercator
Datum: GDA 1994

A4

2.0 MINE PLANNING

Mine closure strategies have been considered and incorporated into mine planning. Mine infrastructure and overburden stockpiles have been planned to consider the following environmental criteria, which will influence success of mine closure:

- Alignment with natural topographic landforms in the area;
- Use of existing cleared areas and overburden stockpiles to minimise new clearing;
- Consideration of natural drainage lines; and
- Avoidance of indigenous heritage sites.

Figures 1.2 and 1.3 illustrate the proposed mine disturbance areas, natural drainage lines, contours and identified indigenous heritage sites.

3.0 LEGAL OBLIGATIONS

Mine closure is subject to both Federal and State legislation and Midwest needs to meet required legal obligations during design, operation and closure phases of the Project.

The Koolanooka / Blue Hills DSO Mining Project is being assessed under the *Environmental Protection Act 1986*. This Closure Plan will be consistent with the environmental objectives outlined in the Koolanooka / Blue Hills Direct Shipping Iron Ore (DSO) Mining Project PER and the Tilley Siding Stockpile Loading and Transport Facility ARI.

This Closure Plan aims to incorporate requirements under the *Mining Act 1978* and fulfil the conditions placed on Midwest's tenements.

Additional legislation that may be applicable to mine closure is included in Table 3.1.

Table 3.1: Legislation Applicable to Closure and Responsible Government Agencies

Legislation	Responsible Government Agency
Commonwealth Legislation	
Environmental Protection and Biodiversity Conservation Act 1999	Department of Environment and Heritage
Native Title Act 1993	National Native Title Tribunal
State Government Legislation	
Conservation and Land Management Act 1984	Department of Environment and Conservation
Contaminated Sites Act 2003	Department of Environment and Conservation
Country Areas Water Supply Act 1947	Department of Industry and Resources
Dangerous Goods Act 1961	Department of Industry and Resources
Dangerous Goods Regulations 1992	Department of Consumer and Employment Protection
Environmental Protection Act 1986	Department of Environment and Conservation
Explosives and Dangerous Goods Act 1961	Department of Industry and Resources
Explosives and Dangerous Goods (Dangerous Goods Handling and Storage) Regulations 1992	Department of Industry and Resources
Health Act 1911	Department of Health
Health (Pesticides) Regulations 1956.	Department of Health
Mining Act 1978	Department of Industry and Resources
Mines Safety and Inspection Act 1994	Department of Consumer and Employee Protection
Rights in Water and Irrigation Act 1914	Department of Environment and Conservation
Soil and Land Conservation Act 1945	Department of Agriculture, Western Australia
Water and Rivers Commission Act 1985	Department of Environment and Conservation
Waterways Conservation Act 1976	Department of Environment and Conservation
Wildlife Conservation Act 1950	Department of Environment and Conservation

3.1 GUIDELINES AND CODES OF PRACTICE

The Guidelines and Codes of Practice outlined below were used in the preparation of this document, and contain material relevant to this closure plan:

- ANZMEC/MCA (2000), Strategic Framework for Mine Closure. Australian and New Zealand Minerals and Energy Council and Minerals Council of Australia. Canberra, ACT;
- Association of Mining and Exploration Companies Mine Closure Guidelines (AMEC, 2000);
- Australian Mining Industry Council (1989), Mine Rehabilitation Handbook;
- Chamber of Minerals and Energy of Western Australia Inc (1999) Mine Closure Guidelines for Minerals Operation in Western Australia;
- Guidelines for Mining in Arid Environments (DOIR, 2006);
- Guidelines for Mining Proposals in Western Australia (DOIR, 2006);
- Mine Closure Guideline for Minerals Operations in WA. (DoIR, 2000); and
- Minerals Council of Australia (February, 2000) Code for Environmental Management.

4.0 STAKEHOLDER CONSULTATION

Midwest has been in consultation with key responsible authorities, non-government organisations as well as the local communities since the commencement of the feasibility studies.

Ongoing consultation with responsible authorities, the general public, private landowners, interested Non-Government Organisations (NGOs) and other stakeholders will continue throughout the operation of the mine life and the closure process. The closure process will not be viewed as complete until commitments made by Midwest to stakeholders concerning site closure have been met.

The Strategic Framework for Mine Closure (2000) highlights the importance of enabling all stakeholders to have their interests considered during the closure process.

Stakeholders that have been identified as having an interest in the Koolanooka / Blue Hills DSO Mining Project and/or the Tilley Siding have been identified in Table 4.1

Table 4.1: Stakeholder consultation.

Stakeholder Group	Stakeholder Contact
Shire of Morawa	CEO and President of the Shire of Morawa
Shire of Perenjori	CEO and President of the Shire of Perenjori
DEC Environmental Protection Branch	Nick Woolfrey.
DEC Threatened Species Unit	John Blyth, Rosemary Rees, John Riley.
DEC Midwest Region	Beth MacKernan
DoIR	Eugene Bouwhuis, Ana Mesquita,
DEC EPASU	Danielle Griffiths
Morawa Agricultural College	
Morawa High School	
Landowners	Lindsay, Noeline, Dean and Tonia Carslake, David and Jodie Baxter, John and Rebecca Cunningham, Robert and Susie Moore, Colin and Carol Malcolm, Trevor and Shirley Tapscott.
Conservation Council of WA	Chris Talentyre
Wildflower Society of WA	Brian Moyle
Native Title Claimants	The Widi Mob, Pandawn Descendants, Yamatji Marlpa Barna Baaba Aboriginal Corporation, Amangu Mob.

The Mine Closure Plan will continue to be reviewed based on input from stakeholders to ensure all parties are agreed on final land use, decommissioning and rehabilitation procedures.

5.0 CLOSURE OBJECTIVES AND CRITERIA

5.1 CLOSURE OBJECTIVES

The broad post closure objectives for the Koolanooka / Blue Hills DSO Mining Project are:

- To meet legislative requirements and ensure public safety;
- Avoid or minimise project related environmental and socio-economic impacts;
- Conduct effective consultation to enable stakeholders, including regulatory agencies, non-government organisations and other interested parties, to have their interests considered during the mine closure process;
- Re-establish landforms and vegetation communities to meet the agreed post-mining land use requirements;
- Achieve closure completion criteria, as confirmed by monitoring, to allow for effective and complete relinquishment of tenements; and
- Fulfil all commitments in this Closure Plan.

Further objectives of this Closure Plan outlined in the Australia and New Zealand Minerals and Energy Council (ANZMEC/MCA) Strategic Framework for Mine Closure (2000) include:

- To enable all stakeholders to have their interests considered during the mine closure process;
- To ensure the process of closure occurs in an orderly, cost effective and timely manner;
- To ensure the cost of closure is adequately represented in company accounts and that the community is not left with a liability;
- To ensure there is clear accountability and adequate resources for the implementation of the closure plan;
- To establish a set of indicators that will demonstrate the successful completion of the closure process; and
- To reach a point where the company has met agreed completion criteria to the satisfaction of the responsible authorities.

Project closure objectives will be achieved by:

- Establishing through survey and investigation a baseline of the environment prior to project disturbance;
- Allocating appropriate cost and resource provision requirements;

- Planning mining and associated activities to best fit with closure concepts;
- Consulting with stakeholders to determine post closure land use and completion criteria for the project areas; and
- Undertaking environmental monitoring to ensure that rehabilitation techniques have been successful in achieving post closure land-use criteria.

5.2 PROJECT CONDITION REPORTS

In order to appropriately determine closure objectives, survey and investigation work was conducted prior to project inception to arrive at a precondition assessment of all proposal areas. Reports that are relevant to closure objectives include:

- Noise and vibration impact (Vipac, 2006 and 2007);
- Dust impact on human health and vegetation (SKM, 2006);
- Flora and fauna including stygofauna, troglofauna and short range endemics (Tingay & Associates, 1996; ATA Environmental, 2004a and 2004b; Bamford 2004 and 2006; Bennett 2003 and 2004; ecologia 2007 c; Woodman 2006)
- Hydrogeology assessments on the impact of groundwater extraction and quality of water used for dust suppression (Rockwater 2004a, 2004b and 2006) ;
- Geochemical and physical analysis of waste rock material (WA Chemistry 2006); and
- Heritage studies including an Aboriginal heritage report (Archaeological) and an Aboriginal heritage survey (Ethnographic) (Hames, 2003; O'Connor, 1996; Quartermaine, 1996 and Western Heritage Research, 2005).

5.3 CLOSURE CRITERIA

Closure criteria are an agreed set of environmental indicators, which upon being met, will demonstrate that agreed outcomes have been achieved and hence the site may be deemed closed. These criteria are inextricably linked to management and monitoring programmes.

Closure criteria will be developed through open and ongoing consultation with relevant stakeholders, providing for a mutually agreeable set of criteria against which the success of the closure and rehabilitation program can be measured. Midwest will consult with all stakeholders and interested parties throughout the life of the project to ensure the agreed closure criteria are and / or will be met, or alternatives agreed to as necessary.

The proposed closure criteria for the Koolanooka / Blue Hills DSO Mining Project have been / will be developed taking into consideration the following factors:

- Public health and safety;
- Regulatory requirements;
- Midwest's Environmental Policy;

- Expectations of stakeholders;
- Geotechnical stability and the suitability of final landforms;
- Sustainability of revegetated areas and surrounding ecosystems;
- No unapproved disturbance of heritage areas; and
- Post-closure land use objectives.

The broad closure criteria and interim rehabilitation targets are summarised in Table 5.1 below, and detailed aspects are contained in the remaining sections of this document.

Table 5.1: Closure Criteria.

Criteria	Objective	Interim Rehabilitation Target
Contamination	• There shall be no contamination of groundwater, surface water and surrounding environment from inappropriate storage or handling of chemicals and hydrocarbons. • Known contaminated sites are remediated to agreed levels as soon as possible.	• Monitoring program demonstrates that pollutant levels at potentially contaminated sites are within regulatory requirements.
Decommissioning	• Project infrastructure that is not required for post closure land use has been removed or disposed of appropriately.	• Infrastructure has been removed and rehabilitation commenced to simulate the pre-disturbance state as closely as possible.
Final Landforms	• Final landforms have been developed such that they will remain structurally and chemically stable, and safe to humans and fauna without ongoing maintenance. Landforms conform to the requirements of agreed post-closure land use.	• Safety and abandonment structures are in place and final landforms have been shaped to design criteria.
Aesthetics and Heritage	• Ensure that aesthetic values and public experience of the landscape are considered, and measures are adopted to reduce the visual impacts on the landscape. • Maintain and protect any significant landscape, indigenous heritage and geo-heritage values.	• GPS photographic monitoring locations are established and show progressive integration of rehabilitated areas with the natural environment.
Surface and Ground Water	• The quality and quantity of ground and surface waters has been maintained, so that existing and potential environmental values, including ecosystem maintenance are protected.	• Monitoring program for ground and surface water indicates no reduction in level and quality as compared to pre-disturbed state. • Photographic evidence that diversions of surface water flow have been returned pre-disturbed state.
Topsoil	• Topsoil remains viable and has the capacity to support a safe, stable and functioning ecosystem that meets the requirements of the post-mining land use.	• Adequate topsoil / alternate subsoil material has been provisioned and stored in advance of mine closure.
Vegetation	• Impacted areas are returned to self-sustaining	• Deep ripping and/or

Criteria	Objective	Interim Rehabilitation Target
	vegetation communities and fauna habitats that reflect pre-disturbed state. • Weed species cover is minimal.	moonscaping has been conducted in rehabilitation areas. • Flora species have been identified for use in rehabilitation and seed collection, and reflect principles of vegetation succession. • Permanent photographic record points and monitoring/analog transect locations have been defined. • Fencing has been erected around rehabilitation target areas to quarantine them from grazing fauna.

6.0 GENERAL REHABILITATION AND CLOSURE STRATEGIES

6.1 CONTAMINATED SITES

Under the *Contaminated Sites Act 2003* a site is considered to be contaminated if it has a substance present at above background concentrations that presents, or has the potential to present, a risk of harm to human health, the environment or any environmental value.

The potential exists for contamination to occur during the life of the Koolanooka / Blue Hills DSO Mining Project due to the handling and storage of hydrocarbons and chemicals. This potential will be minimised by ensuring hazardous materials, such as hydrocarbons and chemicals, are stored in contained areas, any spills of these materials are cleaned up appropriately.

Potential impacts arising from the proposal include:

- Contamination of groundwater, surface water and surrounding environment from inappropriate storage or handling of chemicals and hydrocarbons.

6.1.1 Pre work condition

There are no existing contaminated sites within the project footprint.

6.1.2 Objectives

- No contaminated sites occur through project operations.
- Known contaminated sites are remediated to agreed levels as soon as possible.

6.1.3 Management Actions

- Assess all disturbance areas for contamination.
- Assess overburden stockpiles for Acid Rock Drainage (ARD).
- Determine the extent and severity of contamination.
- Remove the source of contamination.
- Establish the criteria to be met by remediation.
- Set a timeframe for implementation of remediation actions.
- Determine appropriate remediation methods and implemented remediation actions.
- Monitor the results of remediation.
- Keep appropriate records of all actions and results.

6.1.4 Completion criteria

From the Chamber of Minerals and Energy, Mine Closure Guideline for Mineral Operations in WA (Oct 2000), the following completion criteria for contaminated locations will be observed before or during closure:

- All known contaminated sites have been remediated to acceptable levels.

Specific criteria will be determined for each specific contamination situation.

6.2 DECOMMISIONING

Decommissioning will comprise the safe dismantling and removal of infrastructure, the appropriate disposal of waste materials, and the return of impacted areas to a variety of vegetation types and fauna habitats that simulate the pre-disturbance state as closely as possible or other agreed post-mining land use. Where the removal of non-visible infrastructure, or features that have been incorporated into the natural landscape may cause more environmental damage than if left in situ, then their retention will be discussed with the relevant authorities at the time.

6.2.1 Objectives

- Remove or dispose appropriately project infrastructure that will not be required for post closure land uses.
- Modify, as required, any infrastructure that will remain.
- Dispose of all waste material appropriately.

6.2.2 Management Actions

- Through consultation identify what infrastructure will remain and what will be removed.
- Remove infrastructure as agreed.
- Undertake contaminated site assessment as necessary.
- Undertake contamination remediation and rehabilitate all sites to the agreed completion criteria.

6.2.3 Completion criteria

From the Chamber of Minerals and Energy, Mine Closure Guideline for Mineral Operations in WA (October 2000), the following are the desired outcomes concerning site decommissioning:

- Appropriate removal and/or modification of all required infrastructure;
- Stable long term structural integrity is derived;
- Public and environmental health and safety is protected;

- Local water characteristics are preserved;
- Successful rehabilitation occurs where necessary;
- The sustainability of flora and fauna is assured; and
- Consideration of post closure land uses is undertaken.

6.2.4 Removal of Infrastructure

During the decommissioning phase of the project any infrastructure that will not be used by a post closure land user will be removed. Disturbed areas will be rehabilitated to suit post closure land uses and to reflect pre-disturbance condition.

Decommissioning of the mine site infrastructure and facilities will consist of disassembly and removal of the required structures including, but not limited to:

- Diesel generators;
- Bulk Diesel storage areas;
- Portable offices;
- Workshop;
- First aid facility;
- Administration building;
- Ablutions block;
- Water reticulation; and
- Crushing and Screening Plant.

Unless agreement is reached to act otherwise, Tilley Siding and the Mt Karara / Mungada haul road will be decommissioned on project closure and rehabilitated to pre existing landform in accordance with the requirements of the landholder and agreement with responsible authorities.

Additionally, any ancillary infrastructure including water reticulation supplying potable and process waters including any bore field will be decommissioned as required.

6.3 DEVELOPMENT OF LANDFORMS

Midwest will undertake public consultation throughout the planning stage of the proposal concerning final landforms and all Koolanooka / Blue Hills DSO Mining Project work areas.

6.3.1 Pre-work condition

The previous mining operations are clearly visible from the plains to the west of the Koolanooka Hills.

The mining of the Banded Iron Formation (BIF) will not result in an unacceptable degree of change or degradation to the broader natural environment and ecological processes of which it is a part. The mining of the BIF is considered to be within the (perceived) limits of acceptable change.

The anthropocentric or (geo)heritage values of the mine have been considered. The existing Koolanooka pit is listed in the Morawa Heritage Inventory.

The regional area has low topography, with elevations being generally between 250 and 400 m AHD. Prominent ridges such as Koolanooka Hills attain 450 m AHD (about 100 m above the surrounding plain level); highest elevations exceeding 500 m AHD occur in the eastern sector, e.g. at Blue Hills and Mount Mulgine.

6.3.2 Objectives

The objectives for management of final landforms are to:

- Ensure that aesthetic values and public experience of the landscape are considered, and measures are adopted to reduce the visual impacts on the landscape;
- Maintain and protect any significant landscape, indigenous heritage and geo-heritage values; and
- Meet post-mining land use requirements.

6.3.3 Management Actions

- Determine post-mining land use for each site relevant to the project.
- Establish completion criteria, including landform design, for each site.
- Implement rehabilitation methods to achieve the required landform.
- Revegetate the site to the required land-use objective.
- Monitor the sites to determine that agreed outcomes are being achieved.
- Undertake remedial action as necessary to remedy any deviation from the required objective.
- Record all actions at each site.

6.3.4 Completion Criteria

- Landform design criteria have been met.
- Pre-existing overburden stockpiles at Koolanooka have been amended, reshaped and rehabilitated to improve poor historic rehabilitation.

- Erosion control measures have been put in place and natural drainage lines have been restored.
- All project infrastructure has been removed or left in a condition as agreed and rehabilitation of the site to final land use requirements has been completed.
- Haul roads have been rehabilitated where required.
- Aboriginal heritage sites have not been disturbed without approval from DIA and the area's traditional custodians.
- All sites have been signed off by stakeholders and responsible authorities.

6.4 SURFACE AND GROUNDWATER

The Project has minimal potential to impact on groundwater quality through spillages of liquid chemicals and hydrocarbons and the disposal of various forms of solid and liquid wastes. Site infrastructure and operational controls will be designed to minimise disruption to surface water flow and operational controls implemented to prevent contamination of surface and groundwater.

6.4.1 Pre-work Condition

Koolanooka

Drainage is mainly weak and low-gradient, predominantly to the Mongers Lake palaeo-drainage system which passes a few kilometres to the north of Koolanooka Hills and includes the Yarra Yarra Lakes to the west of Carnamah.

Koolanooka Spring, a near surface, ephemeral creek line that relies on recent rainfall is located 4 km to the south east of the Project between two granite hills, draining northwards. There is no surface water or flow in the dry months of the year. The spring is reported to carry water in wet seasons, which is attributed to seepage of local rainwater through the soil and weathered bedrock from adjacent hills and slopes onto the gully floor.

Blue Hills

The only surface water feature of note within the Blue Hills region is a Gilgai wetland system approximately 700m south of the Mungada pits. It is not anticipated that the Project will influence this feature as it is well away from the existing pits and is separated from them by the Mt Karara / Mungada haul road.

6.4.2 Objectives

The closure objectives for ground and surface waters are:

- The quality and quantity of ground and surface waters has been maintained, so that existing and potential environmental values, including ecosystem maintenance are protected;
- The integrity, ecological functions and environmental values of wetlands and drainage systems interacting with the proposal are maintained;

- Any water use related infrastructure has been effectively decommissioned, as per agreed post land use intentions, and natural drainage patterns are reinstated as far as possible dependent on site layout and water management scenarios;

- Waste, pollutant or leachate emissions have not adversely affected environmental values or the health, welfare and amenity of people and land users by meeting statutory requirements and acceptable standards; and

- Contaminated waters have been controlled and contained on site to prevent entry into groundwater, natural drainage systems and surrounding vegetation and remediation has been undertaken as necessary.

6.4.3 Management Actions

- Develop and implement a monitoring program for ground and surface water level and quality.

- Implement systems and practices to avoid pollution events during the operational life of the mine.

- Immediately manage all pollution events to reduce impact on surface and ground water.

- Remove and or control sources of pollution.

- Manage landfill sites and overburden stockpiles to avoid pollution.

- Rehabilitate all disturbed areas relevant to the project to reduce erosion and integrate into the natural drainage system.

- Assess environmentally sensitive water bodies, and conservation estates and dams or bores used by landholders in the vicinity of project operations and where affected by project activities implement agreed remediation actions.

- Undertake monitoring until objectives for this aspect have been met.

- Record all actions and results.

6.5 REHABILITATION

Certain environmental values of the project areas may be impacted as a result of the proposed development due to the expansion of mine pits and overburden stockpiles; the upgrade and maintenance of haul roads; commissioning of mine infrastructure; and the development of Tilley Siding.

Appropriate rehabilitation measures may include but are not limited to:

- Ripping on contours to relieve compaction, reduce erosion and improve water infiltration. Deep ripping will be undertaken where the soil or waste material is of low permeability. In areas where the soil or waste material is of high permeability

scarifying on contours will be undertaken. On steep slopes this may require terracing or benching. All ripping, terracing or benching will be surveyed to ensure that they are on contours;

- Re-establishment of stable landforms with erosion control measures for long term stability will be undertaken;
- Where available, topsoil will be utilised to provide a foundation into which native vegetation will be planted and/or seeded. Topsoil or other suitable material will be applied at an appropriate depth, in the order of 100 mm, to achieve revegetation;
- Vegetation debris, logs and leaf litter, previously stockpiled, from clearing of areas will be spread over rehabilitated areas to provide fauna habitat;
- Direct seeding and/or planting will be undertaken to encourage vegetation growth to stabilise surfaces and aid the integration of landforms into the surrounding landscape and ecosystems. Seeding and/or planting will be undertaken prior to the wet season (as soon as possible after earthworks) using seed and plants native to the Koolanooka and Blue Hills areas;
- Local provenance seeds will be collected from the impacted Blue Hills area and the Koolanooka area prior to disturbance. Local provenance seeds will be stored separately and used in their respective local areas during rehabilitation; and
- Where necessary, fertilizer will be applied to offset the loss of nutrients and soil microbiota associated with loss of topsoil.

6.5.1 Pre work condition

Koolanooka

The proposed mining area was cleared by Western Mining in the 1960s. The proposed new activities will take place in areas where land has been previously cleared. Design criteria will be developed for the stockpiles to take account of the geotechnical and erosion characteristics, local topography, crest water management and visual amenity. Rehabilitation of existing overburden stockpiles will be incorporated into final landform design.

At Koolanooka, waste rock will be dumped onto the existing overburden stockpile area to the west of the South Fold cutback.

Blue Hills

At Mungada East, waste rock will be dumped onto the existing stockpile to the south west of the pit, and at Mungada West, waste rock will be dumped to the east of the existing stockpile. The stockpiles will form extensions to the existing waste landforms. These extensions will cover areas that had been cleared during historical mining activities.

The majority of the project area is already clear of vegetation and minimal topsoil exists.

Tilley Siding

The area for the proposed Tilley Siding is presently used for cropping.

6.5.2 Objectives

A list of the objectives of rehabilitation follow:

- Ensure that rehabilitation achieves a safe, stable and functioning ecosystem that meets the requirements of the post-mining land use;
- Undertake progressive rehabilitation to minimize open areas as far as possible;
- Weed outbreaks as a result of project activities have been assessed and controlled in a manner agreed with stakeholders and responsible authorities;
- Rehabilitation measures and methods utilised comply with agreed and approved rehabilitation management guidelines;
- Practices fulfil commitments made to stakeholders and regulators regarding closure outcomes; and
- Should Midwest not undertake further operations upon the completion of mining of the Koolanooka / Blue Hills area, all sites impacted by the project will be rehabilitated to agreed rehabilitation outcomes.

6.5.3 Management Actions

- Rehabilitate sites to the agreed criteria.

6.5.4 Completion Criteria

- All observed outbreaks of weeds have been eradicated, and monitoring undertaken for future outbreaks.
- Overburden stockpiles and disturbed sites have been constructed according to the approved design criteria.
- Rehabilitated areas have been revegetated to meet the agreed post-mining land uses.

7.0 COMPONENTS SUBJECT TO GENERAL CLOSURE STRATEGIES

Closure objectives, strategies and completion criteria will be consistent across a number of project aspects where specific closure strategies are not required. These project components are listed in the following section and they will be decommissioned and rehabilitated in accordance with Section 6.0 of this document. The aspects considered at all sites include contamination, decommissioning, landform, surface and groundwater, and rehabilitation.

7.1 WATER SUPPLY INFRASTRUCTURE

Water supply infrastructure will be located at Koolanooka and incorporated with the existing licenced borefield and includes:

- The Koolanooka borefield;
- Water transport, reticulation and storage infrastructure;

Water may be trucked from Koolanooka for use at Blue Hills and Tilley Siding.

7.2 PROCESSING AND TRANSPORT INFRASTRUCTURE

A variety of transport related structures on the Koolanooka / Blue Hills DSO Mining Project and at Tilley Siding will require decommissioning. These include:

- Rail, tracks and hard-stand areas at Tilley Siding, and associated infrastructure; and
- Haul roads and tracks at Koolanooka and Blue Hills.

7.3 FUEL AND EXPLOSIVES FACILITIES

Fuel and explosives storage facilities located at Koolanooka and Blue Hills will require decommissioning. The facilities include:

- Bulk hydrocarbon storage area: 100, 000 L diesel fuel tank at Koolanooka stored in the servicing workshop and managed in accordance with *Australian Standard 1940 – The Storage and Handling of Flammable and Combustible Liquids (AS 1940-1993);*
- Minor storage areas: Servicing workshops at Koolanooka and Blue Hills, may contain oil drums and other materials may need to be removed and disposed appropriately;
- Explosives magazines may need to be demobilised; and
- A designated site for bioremediation may need to be remediated, as soil and biodegradable materials contaminated by hydrocarbons will be disposed in such an area in accordance with the Environmental Protection Authority Guidelines for Oil Farming of Oily Wastes;

7.4 WORKSHOP FACILITIES

Workshop facilities will be established for the repair and maintenance of mine equipment.

These facilities will include:

- haul truck and mining equipment maintenance bays;
- light vehicle workshops;
- lubrication area;
- welding and boiler making area;
- wash-down bays;
- spare parts storage containers;
- tyre stores; and
- site offices.

Facilities will be decommissioned if not required for post-mining land use.

7.5 SEWERAGE

Existing septic tank and leach drain toilets will be used at Koolanooka. Similar facilities will be established at Blue Hills. Mobile chemical toilets will be utilised at Tilley Siding.

7.6 PORTABLE BUILDINGS

Portable offices, ablutions and a first aid facility are located at Koolanooka and Blue Hills.

A small accommodation camp (50 person maximum) will be established at Karara homestead and a workshop facility will be established near Koolanooka within previously disturbed areas.

8.0 SPECIFIC CLOSURE STRATEGIES

In addition to the general rehabilitation and closure strategies listed in the previous section closure objectives, strategies, and completion criteria applicable to individual project components are described below.

8.1 KOOLANOOKA AND BLUE HILLS PITS

8.1.1 Closure Objectives

- Ensure public safety by restricting access to pits.
- Ensure final landforms are structurally stable.

8.1.2 Management Strategies

Stability of Pit Walls

- Prior to closure, undertake engineering assessments to determine the optimum final landform of the mine pit walls to account for stability and safety requirements.

Safety Bunds

- An abandonment bund wall will be constructed around the perimeter of pit voids greater than 5 m in depth.
- The bund wall will be constructed outside the area designated as being susceptible to wall collapse.
- The location and design of the abandonment bund wall will be in accordance with procedures detailed in "*Safety Bund Walls Around Abandoned Open Pit Mines*" (DME, 1997).

8.1.3 Completion Criteria

- Pit voids and walls meet stability and safety requirements.

- Safety bunds comply with the procedures detailed in "*Safety Bund Walls Around Abandoned Open Pit Mines*" (DME, 1997).

8.2 OVERBURDEN STOCKPILES

8.2.1 Current Status

Koolanooka

The South Fold orebody outcrops at the top of the unmined hill to the immediate south east of the existing Koolanooka pit. The haematitic BIF extends to surface in these areas and there is little residual soil for stockpiling and use in rehabilitation.

Overburden stockpiles will be placed on existing stockpiles and on existing cleared areas wherever possible.

Mining at Koolanooka will stop after 18 months of operation, at which point new and historic overburden stockpiles will be rehabilitated.

Blue Hills

At Mungada East, overburden will be placed to the south west of the existing stockpiles, and at Mungada West, overburden will be placed on the eastern flank of the BIF ridge. The stockpiles will form extensions to the existing waste landforms. The majority of these extensions will cover areas that have already been cleared during previous mining activities.

Placement Criteria

The following environmental criteria were considered in the planning of overburden stockpile locations:

- Alignment with natural topographic landforms in the area;
- Use of existing cleared areas and overburden stockpiles to minimise new clearing;
- Limiting of interference with natural drainage lines; and
- Avoidance of indigenous heritage sites.

8.2.2 Closure Objectives

- Rehabilitation achieves a safe, stable, non-polluting landform consistent with the surrounding landscape. Revegetation is consistent with the surrounding flora and land use, or other land use as agreed.
- A sufficient cover of vegetation is established to minimise erosion and to fulfil agreed rehabilitation commitments.
- Final landform conforms to design criteria and is resistant to erosive events.

8.2.3 Overburden Stockpile Design and Management

Overburden stockpiles will require earthworks and subsequent revegetation through seeding or planting to ensure they are stable and blend into the surrounding landscape.

Design

The overburden stockpiles at Koolanooka will be developed on existing stockpiles remaining from previous mining operations. No new clearing will be required. The final form of new overburden stockpiles will conform to the design criteria outlined below. Where possible existing overburden stockpiles will be shaped to improve stability and rehabilitation success.

Two new overburden stockpiles will be developed at the Blue Hills Mungada East and West sites. Construction will utilise a bottom up methodology incorporating progressive rehabilitation. Outside faces of stockpiles are to be constructed initially and rehabilitated upon completion of each level. The methodologies outlined in *Guidelines for Mining in Arid Environme*nts (DoIR, 2006) will be applied to the construction of stockpiles.

Error! Reference source not found. and **Error! Reference source not found.** illustrate the design of the overburden stockpiles in cross-section and birds-eye view.

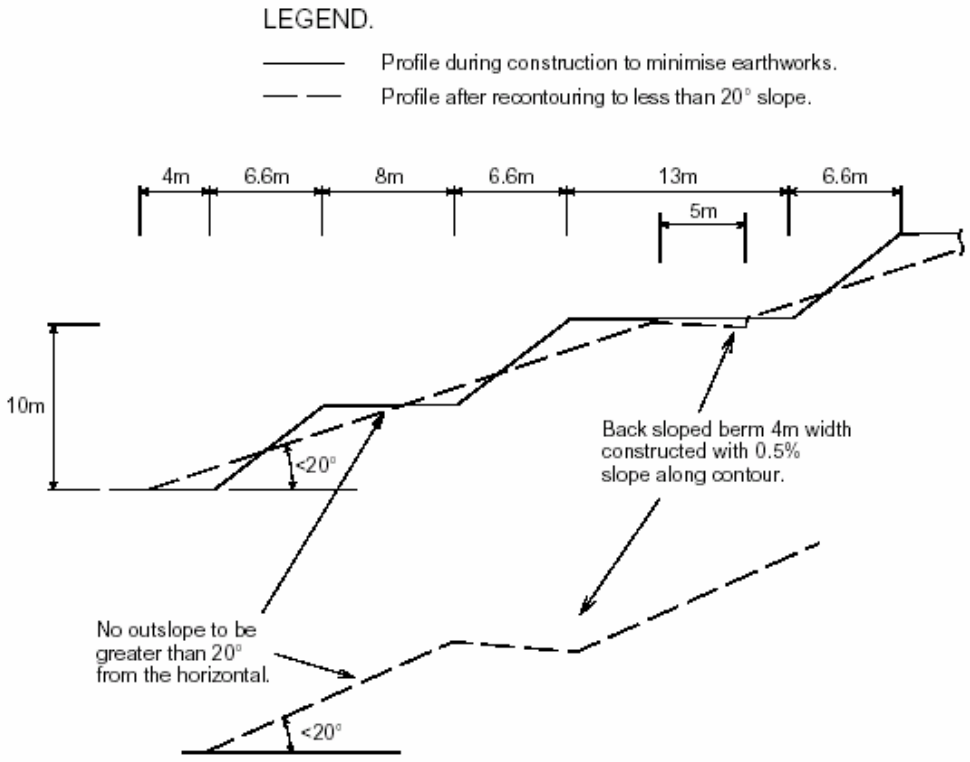

Figure 8.1: Overburden stockpile profile (Source: DoIR, 2006).

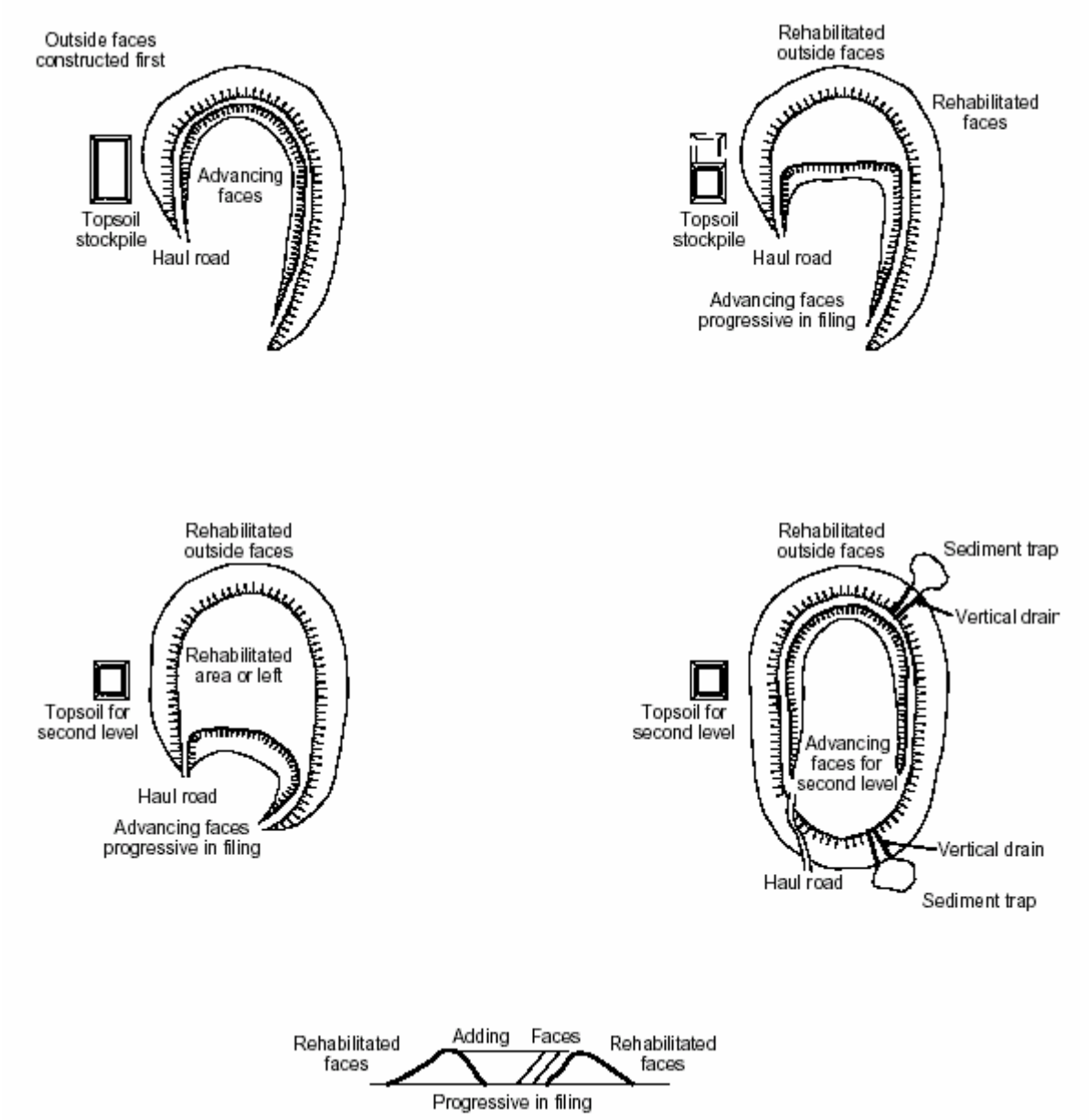

Figure 8.2: Overburden stockpile overview (Source: DoIR, 2006).

Topsoil

Topsoil will be stripped in advance of the overburden stockpile face and stored. Topsoil will be stripped to 100 mm and subsoil up to 500 mm depth where available. If possible, topsoil will be re-spread directly on overburden stockpiles. Stripped topsoil and subsoil that cannot be directly re-spread will be stockpiled separately according to the methodologies outlined in *Guidelines for Mining in Arid Environments* (DoIR, 2006).

Topsoil stockpiles will be located within the marked overburden stockpile disturbance areas at Blue Hills (

Figure 1.3) and on previously cleared areas at Koolanooka (

Figure 1.2).

The existing environment within the project areas naturally consists of shallow depths of topsoil and subsoil. Overburden stockpiles will be re-spread with topsoil and subsoil to equivalent depths as those occurring in undisturbed areas. To ensure sufficient volumes of subsoil are available for re-spread on overburden stockpiles, the following measures will be undertaken:

- In advance of pit extensions, topsoil will be stripped to a depth of up to 100 mm and stored separately at designated topsoil stockpile locations.
- Weathered material retrieved from pit extensions will be stored separately at designated subsoil stockpile locations.
- Topsoil will be stripped to a depth of up to 100 mm in advance of overburden stockpile toes over the anticipated stockpile footprints and stored separately at designated topsoil stockpile locations.
- Subsoil will be stripped to a depth of up to 500 mm in advance of overburden stockpile toes over the anticipated stockpile footprints and stored separately at designated subsoil stockpile locations.

Estimates of the volume of subsoil that is potentially available for stripping from overburden stockpile footprint areas, is included in Table 8.1, and is dependant on the nature of the specific soil profile present at clearance locations. It should be noted that this estimate is based on the assumption that the depth of soil profile indicated in the Depth column of the table is available across the entire area to be disturbed, and this depth is expected to be significantly less at locations close to pit outcrops, than in areas designated as waste dumps. Where the availability of topsoil and subsoil is less than the quantity indicated for specific sections of the project in practice, Midwest will develop other options for sourcing this material, from approved borrow pits, other disturbed areas or from suitable pit overburden material.

A further assumption has been made regarding disturbance to soil within the new Mungada pit areas; the full size of both estimated areas has been reduced by one quarter, due to the presence of pre-existing pits at both of these locations.

Estimates of the volume of subsoil required for overburden stockpile rehabilitation are listed in Table 8.2. An assumption with regard to the estimate of subsoil requirement for areas to be rehabilitated is that the surface area needed will be 115% of that of the original area disturbed, due to the convex shape of the final waste dump design.

Table 8.1: Subsoil availability.

Location	Area (m^2)	Depth (m)	Volume (m^3)
Koolanooka Pits	63,000	0.2	12,600
Koolanooka Waste Dumps	269,629	0.5	134,814
Mungada East Waste Dump	150,400	0.5	75,200
Mungada East Pit	64,000	0.2	12,800
Mungada West Waste Dump	210,000	0.5	105,000
Mungada West Pit	53,000	0.2	10,600
		Total Volume	**351,014**

Table 8.2: Subsoil requirements.

Location	Area (m^2)	Depth (m)	Volume (m^3)
Koolanooka Waste Dumps	310,073	0.5	155,036
Mungada East Waste Dump	172,960	0.5	86,480
Mungada West Waste Dump	241,500	0.5	120,750
		Total Volume	**362,266**

Topsoil will be spread to a minimum of 100 mm thickness over a 500 mm layer of subsoil. Topsoil will be spread preferentially over the overburden stockpile top level and benches where vegetation establishment is more likely.

Erosion Control

The overburden stockpiles will be designed to encourage infiltration and drainage of surface water, minimising surface flow. The final slope profile of the stockpiles will conform to the following design criteria:

- Overburden stockpile toe does not extend into the area surrounding the pit where collapse is possible;
- Bank slopes are restricted to a maximum angle of 20°;
- Berms are placed every 10 m of vertical height;
- Berms are sloped into the stockpile at 5° angle;
- Berms have cross bunds every 30 m of length to reduce water flow along the berm.
- Peak of overburden stockpiles does not exceed the height of surrounding natural land forms (400 m at Koolanooka, 440 m at Blue Hills).

On the completion of outer stockpile slopes, scalloping will be conducted using a bulldozer on all faces after subsoil and topsoil application. Additional erosion control measures may be implemented if necessary. This would include vertical drains and sediment traps. A

shallow bund will extend around the overburden stockpile perimeter to trap sediment and reduce surface water flow.

Revegetation

Seeding programs will be conducted prior to the wet season (May – August) on overburden stockpile surfaces that have been respread with top/subsoil and scalloped. Provenance seed collection is to occur during the flowering season (generally after spring) one year prior to planned rehabilitation.

Where possible any cleared vegetation and litter will be stockpiled for respreading on areas to be rehabilitated.

Flora species have been chosen for rehabilitation based on vegetation communities identified in botanical surveys conducted over the project areas. Principles of succession will be incorporated into species selection, and rehabilitation will also include efforts to re-establish Priority Flora taxa. Discussions with the Department of Environment and Conservation will be carried out to ensure that appropriate seed mixes are used over the areas to be rehabilitated. Those taxa that can be propagated easily would also be suitable to be replanted as tube stock and could be propagated in advance. The species listed in Table 8.1 below are recommended for rehabilitation purposes at the three overburden stockpile sites.

Table 8.1: Species to be used in rehabilitation.

Family	Species
Koolanooka:	
Amaranthaceae	*Ptilotus obovatus*; *P. polystachyus* var *polystachyus.*
Casuarinaceae	*Allocasuarina acutivalvis* subsp. *prinsepiana.*
Mimosaceae	*Acacia acuminata, A. assimilis subsp. assimilis, A. exocarpoides, A. sclerosperma* subsp. *sclerosperma, A. tetragonophylla.*
Myoporaceae	*Eremophila oldfieldii* subsp. *oldfieldii.*
Myrtaceae	*Melaleuca fulgens* subsp*. fulgens, M. nematophylla, M. radula.*
Papilionaceae	*Daviesia hakeoides* subsp*. hakeoides.*
Proteaceae	*Grevillea levis, G. paradoxa.*
Sapindacea	*Dodonaea inaequifolia.*
Mungada West:	
Amaranthaceae	*Ptilotus obovatus*; *P. obovatus* var *obovatus, P. schwartzii.*
Casuarinaceae	*Allocasuarina acutivalvis* subsp. *prinsepiana.*
Mimosaceae	*Acacia aneura* var *aneura, A. aneura* var *argentea, A. aulacophylla, A. coolgardiensis* subsp*. effusa, A. exocarpoides, A. ramulosa* var. *ramulosa, A. tetragonophylla, A. woodmaniorum* (P2).
Myrtaceae	*Aluta aspera* subsp*. hesperia, Eucalyptus ewartiana, E. loxophleba* subsp*. supralaevis, Melaleuca nematophylla, Micromyrtus obovata, M.* sp*. Warriedar (P1), Thryptomene decussata.*
Papilionaceae	*Gastrolobium laytonii, Mirbelia bursarioides*
Proteaceae	*Grevillea acacioides, Hakea invaginata, H. recurva* subsp*. recurva, Persoonia pentasticha* (P3).
Rutaceae	*Philotheca brucei* subsp*. brucei.*
Sapindacea	*Dodanaea inaequifolia, D. petiolaris, D. viscosa* subsp*. spatulata*.
Mungada East:	
Amaranthaceae	*Ptilotus exaltatus*, *P. obovatus* var *obovatus.*
Cuppressaceae	*Callitris columellaris.*

Family	Species
Mimosaceae	*Acacia acuminata, A. aneura* var *major, A. anthochaera, A. assimilis subsp. assimilis, A. aulacophylla, A. burkittii, A. coolgardiensis* subsp*. coolgardiensis, A. exocarpoides, A. obtecta, A. ramulosa* var. *ramulosa, A. tetragonophylla, A. woodmaniorum* (P2).
Myrtaceae	*Eucalyptus ewartiana, E. loxophleba* subsp*. supralaevis, Melaleuca leiocarpa, M. nematophylla, M.* sp*. Warriedar (P1), Thryptomene decussata.*
Papilionaceae	*Mirbelia bursarioides*
Proteaceae	*Hakea recurva* subsp*. recurva, Persoonia pentasticha* (P3).
Rutaceae	*Philotheca brucei* subsp*. brucei.*
Santalaceae	*Santalum acuminatum.*
Sapindacea	*Dodanaea inaequifolia*.

Revegetation targets will be set at a density, complexity and diversity of base-line data to replicate surrounding vegetation, in consultation with DEC. Completion criteria will be developed in consultation with DEC to determine when the rehabilitation can be considered self sustaining.

8.2.4 Completion Criteria

- Overburden stockpiles conform to design criteria.
- Stockpiles meet stability, soil and vegetation criteria as determined through consultation with DEC.

8.3 BORROW PITS AND HAUL ROADS

8.3.1 Objectives

- Profile of final borrow pits are safe, stable, blend into the surrounding landscape and are not prone to erosion.
- Borrow pits are contour ripped and spread with 100 mm depth of topsoil.
- Pits are free draining.
- Vegetation is comparable to immediate surrounds in species composition and cover.

8.3.2 Closure Strategy

- Borrow pits are progressively rehabilitated during the operational life of the mine, or following closure of the pit.
- Sides of the borrow pits will be battered to a slope equal to or less than 20°.

- Where required, culvert diversion drains and upslope windrows will be used to divert surface flow from entering pits and contributing to waterlogging or erosion.
- Borrow pits will be contour ripped, spread with topsoil and seeded with provenance seeds.

8.3.3 Completion Criteria

- Borrow pit slopes are no greater than 20°.
- Contour ripping or scarifying has been conducted.
- Vegetation is comparable to immediate surrounds in species composition and cover.

8.3.4 Haul Roads

It is anticipated that haul roads will be utilised for post-closure land use. There are several possible outcomes for closure of the haul road from Blue Hills to Koolanooka:

- Haul road remains as a permanent access road for post-closure land use.
- Haul roads are to be decommissioned – the rehabilitation procedures outlined in Section 6.0 will be followed.
- Haul road is to remain with a reduced width – road will be narrowed with rehabilitation on cleared shoulders conducted in accordance with Section 6.0.

9.0 MONITORING, MAINTENANCE AND ACCOUNTABILITY

9.1.1 Monitoring

The implementation of a monitoring programme is crucial in recording the success or otherwise of the completion criteria, as well as validating agreed criteria for relinquishment (Chamber of Minerals and Energy, 1999). Monitoring will address the following areas:

- Biological (flora and fauna);
- Surface and groundwater;
- Remediation of contaminated sites and acid rock drainage issues;
- Public safety;
- Landform stability; and
- Revegetation status.

Monitoring will identify the need for further remedial work at an early stage. Monitoring plans will be developed in consultation with appropriate regulatory agencies, and will include agreed actions if it is determined through monitoring that completion criteria are not being met. Monitoring will be undertaken by Midwest until the completion criteria have been finalised.

Rehabilitation will be conducted progressively where possible, and as such, final closure works are not anticipated to exceed 12 months from closure. The Koolanooka mine pits and

overburden stockpiles will be decommissioned after 18 months of operation. This presents an opportunity to trial and update methodologies based on rehabilitation success at Koolanooka prior to implementation at Blue Hills.

During closure works the Midwest Environmental Officer (EO) will be present at Koolanooka and Blue Hills to ensure safety and monitor rehabilitation. The Midwest EO will attend the sites periodically to conduct assessment of rehabilitation success. Several one-off assessments will be conducted on mine closure. Table 9.1 summarises the timing of monitoring programs. Note that monitoring will commence at Koolanooka sites after 18 months of operation, and earlier where sites are progressively rehabilitated.

Table 9.1: Timing of Close Monitoring.

Aspect	Monitoring	Criteria	Timing
Public Safety	• Engineering assessment of stability of final landforms. • Abandonment bunds in place and adequate signage.	• Agreed CP criteria. • Safety Bund Walls around Abandoned Open Pit Mines (DME, 1997)	On closure
Overburden Stockpiles	• Engineering assessment of stability of final landforms and erosion.	• Agreed CP design criteria.	On closure. 6 months.
Contamination	• Contaminated sites assessment.	• Contaminated Sites Act 2003.	On closure. 6 months after remediation if required.
Acid Rock Drainage	• Assessment of overburden stockpiles for acidity.		On closure. 1 year.
Water	• Ground and surface water assessment	• Groundwater – TDS, SWL, component analysis meet requirements. • Surface – TSS, pH, EC meet requirements. • Drainage – agreed CP criteria.	On closure then annually for 3 years or until completion criteria is satisfied.
Rehabilitation Earthworks	• Confirmation that earth works have been completed at all sites in accordance with specifications.	• Agreed CP design criteria.	12 months
Vegetation	• Visual assessment of rehabilitated/revegetated areas. Includes assessment of weed species, vegetation establishment and cover, and erosion.	• Agreed CP criteria.	18 months (6 months after seeding).
Maintenance	• Implement maintenance procedures if required.	• Agreed CP maintenance strategies.	12 months. Annually as required until completion criteria is satisfied.

The Project Manager will be responsible for ensuring adequate resources for implementation of closure and monitoring activities. This encompasses financial and staffing aspects.

The site Environmental Officer is responsible for ongoing revisions of the Closure Plan, engagement with stakeholders and implementation of closure strategies. This includes progressive rehabilitation, monitoring and maintenance programs.

9.1.2 Maintenance

Based on monitoring assessments, periodic maintenance may be required to ensure rehabilitation success. Where closure criteria have not been met, remedial action may be required. Table 9.2 identifies project aspects and actions that will be implemented in the event of incomplete or unsuccessful rehabilitation. Regular maintenance and identification of rehabilitation problems at an early stage will contribute to successful environmental outcomes and mine closure.

Table 9.2: Possible maintenance actions.

Aspect	Possible Maintenance Action
Landform Stability	• Contour ripping or scalloping in effected areas. • Rock armouring. • Implementation of permanent drainage structures.
Contamination and ARD	• Bioremediation. • Transportation for treatment of contaminated soils. • Implementation of ARD control measures.
Vegetation	• Reseeding of rehabilitation areas. • Removal/spraying of weeds.
Topsoil viability	• Additional ripping/aeration. • Application of fertilizers.
Introduced Fauna	• Repairs to stock fencing. • Erection of new fencing.

10.0 SUSPENSION OF MINE OPERATIONS

In the event of a temporary suspension of mine operations, the *Mines Safety and Inspection Regulations 1995* will be utilised to guide development of a suspension plan. The DoIR will be notified of the nature of the suspension and measures in place that will limit impact to the environment and ensure health and safety requirements are met.

The suspension plan will not consist of a full rehabilitation and closure strategy but will incorporate interim measures. In the event that a decision to decommission operations is made during a suspension period, closure strategies outlined in this Closure Plan will be implemented in full.

As a minimum the suspension plan would include:

- Maintenance of drainage structures to limit erosion events and sedimentation of surface water;
- Removal of chemicals, hydrocarbons and other hazardous substances. This includes assessment of containment facilities and bunds to ensure contamination is not possible;
- Provision of maintenance staff / caretakers to monitor mine conditions;
- Ensure adequate on-site facilities for any staff remaining at the operations;

- Revision of reporting procedures and consultation with regulators regarding mine suspension;
- Removal of domestic and industrial waste products, and waste facilities; and
- Provision of adequate signage, safety measures and security to ensure no un-authorized access to the mine site.

11.0 COSTS AND RESOURCES

Provision of adequate financial resources for closure is critical in order to ensure that all closure requirements are reached, as agreed via consultation, and to finalise the project without leaving residual company or community liability.

Appropriate costing for closure will only be able to be further defined as the proposal is developed and an estimate for costs associated with closure will be included in this plan from one year after project commencement.

The ANZMECC Strategic Framework for Mine Closure (2000) objective for closure costing is to ensure the cost of closure is adequately represented in company accounts and that the community is not left with a liability.

Development of a final closure cost model will incorporate the following aspects:

- Conduct technical review and analysis of risk and cost benefit;
- Quantify subjective factors and analyse aspects with uncertainty;
- Manage closure of the project as a self-funded operation and the project business plan includes costs, revenues, profit / loss and cash flows;
- Assess closure costs in terms of economic, technical, and social feasibility;
- Determine that closure does not incur long-term liabilities to Midwest or to the community;
- Comprehensively review costs are on a regular pre-determined basis and taking inflation into account;
- Determine that closure financial provisioning remains flexible to cope with unexpected events, new technologies, operational change or change in community or regulator expectations;
- Determine that cost estimates include management of the project related social and environmental issues;
- Include associated monitoring and long-term site management costs;
- Determine that closure cost estimates don’t rely on return from sale of assets and salvage value;
- Provision for adequate form and amount of surety, and upon closure, determine that requirements for release of surety are met; and
- Periodically review assurance levels re-adjusted as closure needs, environmental risks or economic factors dictate.

12.0 RECORDS MANAGEMENT AND REPORTING SCHEDULES

The retention of mine records is important because they provide information concerning the development for incorporation into state and national natural resource data bases, leading to a historic record of activities in the area and the potential to improve future land use planning and/or site redevelopment (ANZMEC / MCA, 2000).

The following records will be kept to enable assessment of Mine Closure Completion and rehabilitation:

- Geological records, including drilling and exploration data;
- Plans and surveys of surface facilities;
- Mining and production records;
- Location, quantities and qualities of overburden stockpiles;
- Location, quantities and types of waste disposed in the area;
- Rehabilitation strategies implemented on overburden stockpiles and other rehabilitated areas;
- Results of rehabilitation as identified in monitoring;
- Additional maintenance conducted post-closure;
- Contamination reports;
- Engineering reports regarding the stability of final landforms;
- LFA survey records for analogue and assessment transects;
- Other site specific surveys or studies; and
- This Mine Closure Plan.

These records will be made available to relevant authorities as required.

13.0 REFERENCES

Alan Tingay & Associates, 1996. *Vertebrate Fauna Koolanooka Mine Site Morawa. Report No 96/53.* Prepared for Kingstream Resources N.L.

Association of Mining and Exploration Companies, 2000. *Mine Closure Guidelines.*

ANZMEC/MCA, 2000. *Strategic Framework for Mine Closure. Australian and New Zealand Minerals and Energy Council and Minerals Council of Australia.* Canberra, ACT.

ATA Environmental 2004a. *Vegetation and Flora Assessment Koolanooka. Report No 2004/23.* Prepared for Midwest Corporation.

ATA Environmental 2004b. *Fauna Assessment Koolanooka. Report 2004/40*. Prepared for Midwest Corporation.

Australian Mining Industry Council, 1989. *Mine Rehabilitation Handbook.*

Bamford Consulting Ecologists, 2004. *Blue Hills Fauna Assessment*, prepared for ATA Environmental

Bamford Consulting Ecologists, 2006. *Mt Karara/Mungada Haul Road; Fauna Assessment*. Unpublished report prepared for Woodman Environmental Consulting Pty Ltd.

Bennett Environmental Consulting, 2003. *Vegetation and Flora Assessment for Koolanooka.* Prepared for Midwest Corporation.

Bennett Environmental Consulting, 2004. *Flora and Vegetation Blue Hills. Prepared for Midwest Corporation.*

Chamber of Minerals and Energy of Western Australia Inc., 1999. *Mine Closure Guidelines for Minerals Operation in Western Australia.*

Department of Industry and Resources, 2006. *Guidelines for Mining in Arid Environments.*

Department of Industry and Resources, 2000. *Mine Closure Guideline for Minerals Operations in WA.*

Department of Industry and Resources, 1997. *Safety Bund Walls around Abandoned Open Pit Mines Guideline.*

Ecologia Environment, 2008. *Koolanooka / Blue Hills Direct Shipping Iron Ore (DSO) Mining Project PER.*

Ecologia Environment, 2007b. *Tilley Siding Stockpile Loading and Transport Facility ARI*. Unpublished.

Ecologia Environment, 2007c. Unpublished, *Koolanooka Hills/Blue Hills Flora and Vegetation Survey*, ecologia Environment, Perth

Minerals Council of Australia, 2000. *Code for Environmental Management*.

Tongway & Hindley, 2004. *Landscape Function Analysis: Procedures for Monitoring and Assessing Landscapes*. CSIRO, Canberra.

Hames Consulting Group,2003. *Section 18 Application under Aboriginal Heritage Act (1972) To Undertake Mining Operations at Koolanooka Hills Western Australia Archaeological Survey and Pandawn Descendants*. Prepared for Midwest Corporation.

O'Connor R., 1996. *Report on an Ethnographic Survey of Exploration Lease E70/1212 at Koolanooka Hills and Exploration Lease E59/462 at Blue Hills*. Prepared for Kingstream Resources N.L.

Quartermaine G., 1996. *Archaeological Site Survey. Report on a Preliminary Archaeological Investigation for Aboriginal Sites Midwest Iron and Steel Project Areas, Mullewa*. Prepared for Kingstream Resources N.L.

Rockwater Pty Ltd, 2004a. *Assessment of Groundwater Supplies for proposed Mining of Iron Ore at Koolanooka.* Unpublished report prepared for Midwest Corporation Ltd.

Rockwater Pty Ltd,2004b. *Assessment of Groundwater Supplies for proposed Mining of Haematite Iron Ore at Koolanooka (Stage 1).* Unpublished report prepared for Midwest Corporation Ltd.

Rockwater Pty Ltd, 2006. *Results of groundwater exploration drilling at Koolanooka and Blue Hills* . Unpublished report prepared for Midwest Corporation Ltd.

Sinclair Knight Mertz, 2006. *Koolanooka Dust Modelling and Impact Assessment*. Prepared for Midwest Corporation Ltd.

Vipac, 2006. *Acoustic Assessment for Tilley Siding*.

Vipac, 2007. *Bund height Noise Matrix for Tilley Siding*.

WA Chemistry Centre,2006. Unpublished *Report for Ecologia Environment on acid sulfate soil testing by Suspension Peroxide Oxidation Combined Acidity and Sulfate method (SPOCAS)*, WA Chemistry Centre, Perth.

Western Heritage Research, 2005, *Report of an archaeological survey of the proposed Blue Hills haul road and Morawa rail siding,* Prepared for Midwest Corporation.

Woodman Environmental Consulting, 2006a. *Flora Survey and Plant Community Mapping: MT Karara / Mungada Haul Road*. Prepared for Gindalbie Gold N.L. and Midwest Corporation.