

COBURN MINERAL SAND PROJECT

Preliminary Mine Closure Plan

Prepared for

Gunson Resources Limited

Level 2, 33 Richardson Street
WEST PERTH WA 6005

21 November 2006

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1.1 Background

Gunson Resources Limited (Gunson) proposes to develop the Coburn Mineral Sand Project (the Project) in the Shark Bay district of Western Australia, approximately 250 km north of Geraldton and 84 km southeast of Denham (Figure 1). The Project is located in the Shark Bay district of Western Australia, approximately 200 km south of Carnarvon, and east of the Shark Bay World Heritage Property (SBWHP).



Figure 1: Regional Location Map

The Project will comprise the excavation and processing of a major low grade heavy mineral sand deposit known as the Amy Zone. The Heavy Mineral Concentrate (HMC) produced at the site will be trucked to Geraldton.

The Amy Zone orebody is approximately 35 km long, up to 3 km wide and between 10 and 40 m thick. The orebody comprises approximately 620 million tonnes of ore hosted in loose, dunal sand with very low clay content. Based on the average grade of 1.1 % heavy mineral, over three million tonnes of HMC will be yielded over approximately 12 years of mining over approximately 20 km of the orebody. The economic minerals of the Amy Zone include ilmenite, rutile, leucoxene and zircon.

The Project includes:

- nine open-cut mine pits, of which only two would be operational at any one time;
- two processing plants (concentrators) that will be relocated as mining progresses northwards;
- a borefield;
- haul roads and access corridors;
- offices, workshops and other supporting infrastructure; and
- an accommodation camp.

The Project Area is located on the Hamelin, Coburn and Meadow pastoral leases. Gunson holds exploration licences, miscellaneous licences and mining leases that cover the Amy Zone and surrounding area, as shown in Figure 2. The mining areas are located on the following mining leases:

- M09/102;
- M09/103;
- M09/104;
- M09/105;
- M09/106;
- M09/111; and
- M09/112.

Exploration licences (E09/940, E09/996 and E09/939) cover the northern section of the Amy Zone. However, Gunson will ensure that mining leases and environmental approval are obtained for the northern section of the Amy Zone prior to mining in these areas.

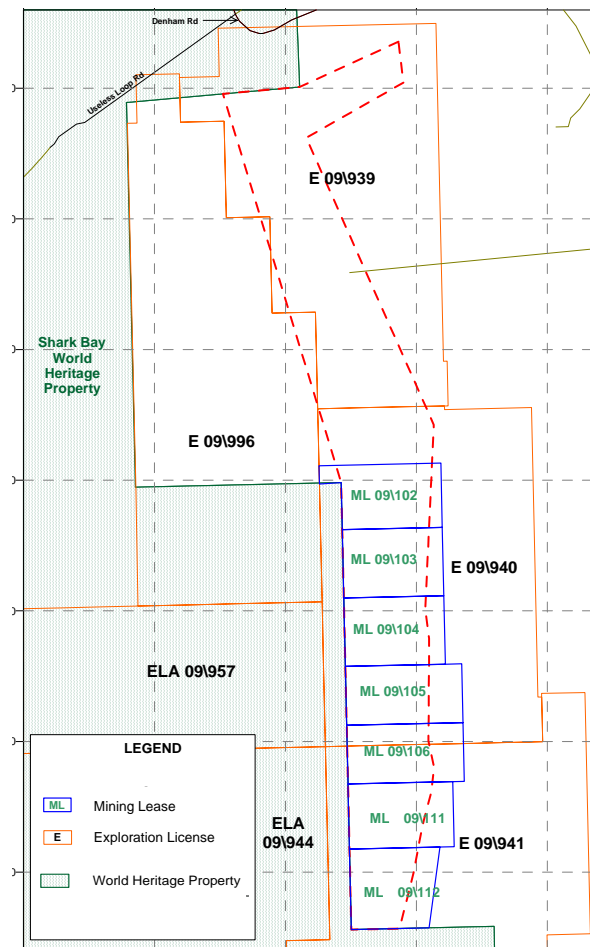


Figure 2: Land Tenure

In April 2005, Gunson purchased the Coburn pastoral lease and has also made arrangements with the pastoral leaseholders of the Hamelin and Meadow leases to access the areas required for the Project. A confidential agreement between Gunson and the Nanda Aboriginal people, whose native title claim covers the southern part of the Amy Zone, was signed on 20 September 2004.

The Project was assessed as a Public Environmental Review (PER) under Part IV of the Western Australian (WA) *Environmental Protection Act 1986*. In addition, the Project is considered to be a "controlled action" under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*. The environmental assessment was conducted in accordance with the bilateral agreement between the Commonwealth of Australia and WA, meaning that the Commonwealth accredited the WA environmental impact assessment process.

The PER (URS, 2005a) was issued in July 2005 for an eight-week public review period and the Report and Recommendations of the WA Environmental Protection Authority (EPA), EPA Bulletin 1211 was published in December 2005. Environmental approval for the Project was granted by the State Minister for the Environment in May 2006 (Ministerial Statement No. 723) and the Commonwealth Environment Minister in July 2006.

Following receipt of all necessary approvals, Gunson proposes to commence construction of the access road in March 2007 and anticipates that mining will commence in early 2008.

1.2 Aim

The aim of the Preliminary Closure Plan is to provide a framework for closure planning for the Coburn Mineral Sand Project and identify those issues that need to be addressed as the closure planning process continues. This plan is consistent with the Australian and New Zealand Minerals and Energy Council (ANZMEC) and Minerals Council of Australia (MCA) (2000) *Strategic Framework for Mine Closure*.

1.3 Structure of this Plan

This Preliminary Closure Plan is structured as follows:

Section 1	Introduction	Describes the aim and structure of the Preliminary Closure Plan.
Section 2	Legislative Framework	Summarises the key legislative requirements relevant to the closure of the Project.
Section 3	Closure Objectives and Completion Criteria	Establishes clear objectives to guide the development and implementation of closure planning for the Project and defines the outcomes of successful rehabilitation and closure.
Section 4	Stakeholder Consultation	Identifies the internal and external stakeholders that should be consulted as part of the closure planning process for the Project. This section also outlines the stakeholder consultation process to be implemented throughout the Project in relation to closure.
Section 5	Decommissioning and Rehabilitation Works	Describes the domains associated with the Project and the physical closure of the facility post-mining, including any dismantling and remediation requirements. This section also describes the rehabilitation process, and identifies maintenance and remedial works that may be required for the site through relinquishment.
Section 6	Management, Monitoring and Reporting	Identifies the environmental monitoring and reporting required for the closure process. This section also outlines the review period for this plan.
Section 7	Contingency Plan for the Care and Maintenance Phase	Outlines the actions required during the care and maintenance phase of the Project.
Section 8	References	Lists those references cited in this plan.

1.4 Relevant Management Plans

The Preliminary Closure Plan addresses mine closure requirements for the Project. However, it is recognised that the implementation of ongoing management strategies during the life of the Project will

contribute to the achievement of closure objectives. Therefore, the Preliminary Closure Plan should be considered in conjunction with the following management plans:

- Progressive Rehabilitation Programme;
- Priority Flora, Flora and Vegetation Management Plan;
- Fauna Management Plan;
- Bush Fire Management Plan;
- Groundwater Mounding Management Plan;
- Dust Management Plan;
- Solid and Liquid Waste Management Plan;
- Hydrocarbon Management Plan;
- Radiation Management Plan; and
- Aboriginal Heritage Management Plan.

Any progressive rehabilitation works, particularly for pits and roads/tracks that are no longer required for the fire or weed management, will be undertaken in accordance with the management strategies outlined in the Progressive Rehabilitation Programme.

2.1 *Environmental Protection Act 1986*

The Project was assessed by the WA EPA under Part IV of the *Environmental Protection Act 1986* and Ministerial approval was obtained on 22 May 2006. The approval was subject to a number of Ministerial Conditions and proponent commitments, which are outlined in Ministerial Statement No. 723. Under Ministerial Condition 13-1, Gunson is required to prepare a Preliminary Closure Plan. The current relevant Ministerial Conditions are as follows:

13-1 Prior to ground-disturbing activities, the proponent shall prepare a Preliminary Closure Plan which provides the framework to ensure that the site is left in an environmentally acceptable condition, to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority.

13-2 The Preliminary Closure Plan required by condition 13-1 shall be prepared to be consistent with the Australian and New Zealand Minerals and Energy Council/Minerals Council of Australia (ANZMEC/MCA) Strategic Framework for Mine Closure and shall address:

- 1. outcomes of stakeholder consultation;*
- 2. conceptual plans for the removal or, if appropriate, retention of plant and infrastructure;*
- 3. long-term management of ground and surface water systems affected by mining operations;*
- 4. management of noxious materials to avoid the creation of contaminated areas (including acid-generating materials);*
- 5. reporting procedures and schedule; and*
- 6. a contingency plan for the care and maintenance phase.*

13-3 The proponent shall make the Preliminary Closure Plan required by condition 13-1 publicly available.

The requirements for the Preliminary Closure Plan are outlined in Condition 13-2. Table 1 identifies the sections where these requirements have been addressed.

Table 1
Preliminary Closure Plan Requirements

Condition No.	Requirement	Relevant Section
13-2 (1)	Outcomes of stakeholder consultation	Section 4.3
13-2 (2)	Conceptual plans for the removal or, if appropriate, retention of plant and infrastructure;	Sections 5.2 – 5.7
13-2 (3)	Long-term management of ground and surface water systems affected by mining operations	Sections 6.1 – 6.2
13-2 (4)	Management of noxious materials to avoid the creation of contaminated areas (including acid-generating materials)	NA*
13-2 (5)	Reporting procedures and schedule	Section 6.5
13-2 (6)	A contingency plan for the care and maintenance phase	Section 7

Note: * No acid sulphate soils were found at the site by Doug Blandford in the baseline soil survey, which was undertaken in March 2004, nor during the pre-mining soil survey of the southern part of the mining area which was conducted in July 2006. No other noxious materials are known to occur at the site.

The *Environmental Protection Act 1986* also contains a range of provisions in Part V of the Act which may also be relevant to closure.

Ministerial Statement No. 723 also contains other conditions that are relevant to the closure of the Project. These conditions are as follows:

13-4 At least three years prior to the anticipated date of closure, or at a time agreed with the Environmental Protection Authority, the proponent shall prepare a Final Closure Plan which is consistent with the ANZMEC/MCA Strategic Framework for Mine Closure and is designed to ensure that the site is left in an environmentally acceptable condition, to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority.

13-5 The Final Closure Plan required by condition 13-4 shall address:

- 1. removal or, if appropriate, retention of plant and infrastructure in consultation with relevant stakeholders;*
- 2. the final form of land forms and voids;*
- 3. reconciliation of volumes of areas to be mined, the volumes of areas remaining to be filled with tailings and the final landform determined in 2. above to demonstrate that there is sufficient material remaining either to be mined or through management of the tailings to achieve the desired landform;*
- 4. long-term management of ground and surface water systems affected by mining;*

- 5. *rehabilitation and revegetation of all disturbed areas to a standard suitable for the agreed new land use(s) and which aim to restore the original vegetation communities in accordance with agreed performance criteria defined within condition 10-8; and*
 - 6. *identification of contaminated areas, including provision of evidence of notification and proposed management measures to relevant statutory authorities.*
- 13-6 *The proponent shall implement the Final Closure Plan required by condition 13-4 until such time as the Minister for the Environment determines, on advice of the Environmental Protection Authority, that the proponent’s closure responsibilities have been fulfilled.*
- 13-7 *The proponent shall make the Final Closure Plan required by condition 13-4 publicly available.*
- 13-8 *The proponent shall report within the Annual Environmental Reports required by condition 5-4 the outcomes of any monitoring programs and performance reviews associated with the implementation of the Preliminary Closure Plan required by condition 13-1 and the Final Closure Plan required by condition 13-4.*

The Project was also assessed and approved under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*. A set of environmental conditions were outlined in the Commonwealth “Decision to Approve the Taking of an Action”. However, there are no conditions in the decision report that are applicable to closure.

2.2 Mining Act 1978

2.2.1 Mining Lease Conditions

Tenement conditions are applied to mining leases prior to the granting of the leases. The WA Department of Industry and Resources (DoIR), under the *Mining Act 1978*, seeks to ensure that environmental protection and rehabilitation are regulated for all land-based operations by applying conditions to the lease. Gunson’s lease conditions that are relevant to mine closure are presented in Table 2.

Table 2
Mining Lease Conditions Relevant to Mine Closure

Mining Lease	Mining Lease Conditions
M09/102, M09/103, M09/104, M09/105, M09/106, M09/111, M09/112	All surface holes drilled for the purpose of exploration are to be capped, filled or otherwise made safe immediately after completion.
M09/102, M09/103, M09/104, M09/105, M09/106, M09/111, M09/112	All costeans and other disturbances to the surface of the land made as a result of exploration, including drill pads, grid lines and access tracks, being backfilled and rehabilitated to the satisfaction of the Environmental Officer, DoIR. Backfilling and rehabilitation being required no later than six months after excavation unless otherwise approved in writing by the Environmental Officer, DoIR.

Table 2 (continued)

Mining Lease	Mining Lease Conditions
M09/102, M09/103, M09/104, M09/105, M09/106, M09/111, M09/112	All waste materials, rubbish, plastic sample bags, abandoned equipment and temporary buildings being removed from the mining tenement prior to or at the termination of exploration program.
M09/102, M09/103, M09/104, M09/105, M09/106, M09/111, M09/112	Unless the written approval of the Director, Environment Division, DoIR is first obtained, the use of drilling rigs, scrapers, graders, bulldozers, backhoes or other mechanised equipment for surface disturbance or the excavation of costeans is prohibited. Following approval, all topsoil being removed ahead of mining operations and separately stockpiled for replacement after backfilling and/or completion of operations.

2.2.2 Mining Lease Surrender

Following rehabilitation and mine closure, Gunson will seek to surrender (relinquish) its mining leases. In order to receive sign-off by regulators, post-closure management and monitoring would be undertaken to ensure that the completion criteria have been met (Section 3.2).

Prior to mine closure, Gunson would determine who would be responsible for the management and relinquishment of the site after closure. The level of post-closure management will depend on the rehabilitation objectives and agreed completion criteria. The development of the post-closure management would include the following:

- Stakeholder consultation;
- Defining what management would be required;
- Considering all leases, not just rehabilitated areas;
- Reviewing safety aspects; and
- Determining funding requirements and the sources of funds.

At this stage of the closure planning process, it is envisaged that post-closure management would include:

- Noxious weed control;
- Exclusion or control of grazing animals;
- Control of public access;
- Repair of any erosion observed;
- Fire management; and

-
- Maintenance of safety signs and fences.

Prior to the relinquishment of each mining lease, the surrender of the tenement must be accepted by DoIR. The surrender process under Part IV - Division 6 of the *Mining Act 1978* requires that a surrender for registration is lodged by the holder of the mining tenement.

3.1 Closure Objectives

Gunson adopts the principles of the ANZMEC/MCA (2000) *Strategic Framework for Mine Closure*. General objectives have been developed to capture all closure aspects relevant to the Project (Table 3).

Table 3
Closure Objectives for the Project

Aspect	Objective
Future land use	Maximise sustainable productive use as a pastoral property and minimise any impacts on surrounding land uses.
	Implement proven rehabilitation procedures, based on the results of trials conducted during progressive rehabilitation activities.
	Return the soil profile and landform to as close to pre-mining conditions, where appropriate to produce a physical system that incorporates the fundamental requirements for vegetation establishment, habitat restoration and ecosystem development.
	Develop final landforms that are compatible with the surrounding landscape.
	Achieve a condition where the processes affecting landform stability are occurring at a rate that meets agreed criteria.
	Revegetate the site to native vegetation, where possible, to meet the agreed completion criteria.
Safety	Leave the site in a condition where the risk of adverse effects to people, livestock and other fauna, and the environment, has been reduced to a level acceptable to stakeholders.
Stability	Achieve a condition where the processes affecting landform stability are occurring at a rate that meets agreed criteria.
Landform	Develop final landforms that are compatible with the surrounding area.
Vegetation	Revegetate the site to native vegetation, where possible, to meet the agreed completion criteria.
Groundwater	Groundwater levels to recover to less than 0.5 m of the pre-mining level in 4-6 years after the completion of mining, however this objective is dependent on the results of future groundwater studies.*
Pollution	Achieve a condition where contaminants at the site are at or below agreed criteria.
Socio-economic	Enable all stakeholders to have their interests considered during the mine closure process.
	Ensure that the closure process occurs in an orderly, cost-effective and timely manner.
	Ensure that the cost of closure is adequately represented in Company accounts and the community is not left with a liability.

Note: The 'groundwater' objective is based on the results of the groundwater investigations which were presented in Appendix D of the PER.

3.2 Completion Criteria

The completion criteria presented in Table 4 are the progressive targets for various ages of the rehabilitation (Year 0, Year 5, Year 15 and Year 30). The criteria that have been proposed for the 30 year timeframe are provided to give the reader an understanding of the expected environment after 30 years. However, the 30 year criteria are not presented with the intention that Gunson will manage the site for this period of time if it can be demonstrated that the rehabilitation is progressing along the predicted trajectory of rehabilitation success after 10-15 years.

Specific performance indicators for soil, vegetation and weeds for the rehabilitation is provided in the Progressive Rehabilitation Programme. The completion criteria presented in Table 4 reflect existing knowledge of the local environment and its ability to recover from disturbance (as described during the 2005 Rehabilitation Benchmarking Study [URS, 2005b]), and also reflect the rehabilitation technology currently available to achieve these goals. However, the criteria will be regularly reviewed and revised to incorporate the results of the research and development programmes implemented by Gunson.

Table 4
Completion Criteria

Element	Criteria
Year 0	
Landform	Area reshaped as far as practical to blend in with the surrounding landscape.
Soils	At least 10 cm of topsoil spread over the entire area.
	At least 90 cm of subsoil spread over the entire area.
	Any soil compaction relieved.
	Any contamination that is suspected or identified will be remediated. Remediation of most soil contamination will be undertaken during the operational life of the Project, minimising the requirement for remedial activities during closure.
Vegetation	Salvaged vegetation spread over rehabilitation area.
	Seeding of early colonising native species in rehabilitation areas prior to rain season.
Access	Access roads have been retained around the rehabilitation area, as required for ongoing fire and weed management, and landscape monitoring.
	Third party access is managed by the installation of locked gates at the site entry point at the western end of the access road.
Safety	No hazards remain from the mining process that may jeopardise health and safety, or negatively affect the rehabilitation process.
	Achieve an upper limit radiation level for all areas such that no member of the public will be exposed to greater than 1 millisievert per year above background levels.

Table 4 (continued)

Element	Criteria
Year 5	
Soils	The rehabilitation area shows no signs of major surface instability, with over 60% of the surface soil having developed a crust.
	Zone infiltration, zone stability and zone nutrients indices are comparable to those found in analogue sites.
Vegetation	Projected alive foliage cover values of local provenance native species is greater than 20% of the foliage cover values of analogue sites.
	Average species diversity is greater than 20% of average species diversity value of analogue sites.
	Native seedlings present and providing greater than 10% of projected foliage cover.
Infrastructure	Most of the infrastructure associated with the Coburn Mineral Sand Project has been removed.
Access	Access roads have been retained around the rehabilitation area, as required for ongoing fire and weed management, and landscape monitoring.
	Third party access is managed by the installation of locked gates at the site entry point at the western end of the access road.
Year 15	
Soils	The rehabilitation area shows no signs of major surface instability, with surface soil characteristics comparable to those of analogue sites.
Vegetation	Projected alive foliage cover values greater than 50% of analogue sites.
	Average species diversity greater than 50% of analogue sites.
	Native vegetation providing greater than 50% of projected foliage cover.
	Decrease in projected foliage cover of weed species.
	Projected foliage cover of weed species in analogue sites has not significantly increased
Access	Access roads have been retained around the rehabilitation area, as required for ongoing fire and weed management, and landscape monitoring.
	Third party access is managed by the installation of locked gates at the site entry point at the western end of the access road.
Year 30	
Vegetation	Projected alive foliage cover values greater than 50% to those of analogue sites.
	Average species diversity greater than 50% of analogue sites.
	Native vegetation providing greater than 50% of projected foliage cover.
	Projected foliage cover of weed species is comparable to analogue sites.
Access	Access roads have been retained around the rehabilitation area, as required for ongoing fire and weed management, and landscape monitoring.
	Third party access is managed by the installation of locked gates at the site entry point at the western end of the access road.
Infrastructure	All infrastructure associated with the Coburn Mineral Sand Project (except that agreed to remain on-site) has been removed and all areas, apart from access roads required for fire control and monitoring programmes, are undergoing rehabilitation.

Table 4 (continued)

Element	Criteria
Final Land Use	Rehabilitation is progressing towards characteristics of analogue sites.
	Vegetation is capable of sustaining grazing and provides habitat for native fauna in the long-term, where possible.
	The site meets the agreed end land use(s).

4.1 Identification of Stakeholders

According to ANZMEC/MCA (2000), “stakeholders [in the mine closure process] are those parties with the potential to be affected by the mine closure process”. Gunson recognises the importance of consulting stakeholders in the closure planning process. A preliminary list of stakeholders has been prepared and is provided below.

- Commonwealth Government
 - Department of the Environment and Heritage (DEH).
- State Government
 - EPA.
 - Department of Environment and Conservation (DEC), incorporating the Department of Environment and the Department of Conservation and Land Management.
 - Department of Water (DoW).
 - DoIR.
 - Department of Agriculture.
- Local Government
 - Shire of Shark Bay.
- Non-Government Organisations and Individuals
 - Pastoral Lease Holders (Meadow, Hamelin and Nerren).
 - Nanda People.
 - Malgana People.
 - Gunson Resources Limited Shareholders.
 - SBWHP Scientific Advisory Committee.
 - SBWHP Community Consultative Committee.

Gunson will consult with the above stakeholders during the preparation of the Final Closure Plan, which will be prepared at least three years prior to the anticipated date of closure.

4.2 Consultation Plan

4.2.1 Objectives and Principles

The objective of stakeholder consultation is to ensure that all stakeholders have their interests considered during the closure planning process.

The principles of stakeholder involvement for the Project will be as follows:

1. Identification of stakeholders and interested parties is an important part of the closure process.
2. Effective consultation is an inclusive process that encompasses all parties and should occur throughout the life of the Project.
3. The communication strategy should reflect the needs of the stakeholders.
4. Adequate resources should be allocated to ensure the effectiveness of the consultation process.
5. Gunson should work with stakeholders to manage the potential impacts of mine closure, wherever possible.

4.2.2 Communication Strategy

The communication strategy for the closure process would include the following:

- Gunson would regularly review the list of stakeholders to ensure that it is up-to-date.
- Gunson would actively consult with stakeholders to develop an understanding of the concerns and issues associated with closure.
- Gunson would maintain responsibility for the outcomes of all consultation performed by company personnel and its consultants.
- Wherever possible, Gunson would maintain continuity in the personnel undertaking the public consultation and interacting with key stakeholders.
- In order to avoid unrealistic demands and expectations from stakeholders, Gunson would be clear and firm in describing the likely or possible outcomes of the closure process.
- Gunson would inform and consult with relevant government agencies regarding the scope of the closure process.
- Gunson would periodically evaluate the consultation process to determine the effectiveness of the process.

4.3 Outcomes of Stakeholder Consultation

4.3.1 Comments Received During the PER

Gunson consulted with Commonwealth, State and local government agencies and other stakeholders prior to the submission of the PER. Issues raised during this consultation and Gunson's responses are documented in Section 5 of the PER (URS, 2005a). Public comment was also received during the eight-week public review period for the PER, with issues raised and Gunson's responses documented in the Proponent's Response to Submissions (URS, 2006).

The key stakeholder issues and the relevant sections of this document where these issues have been addressed is provided in Table 5.

Table 5
Outcomes of Stakeholder Consultation

Stakeholder	Key Issue	Relevant Section
Wildflower Society of WA (Inc.)	There was a query regarding the requirement for concrete foundations at the processing plant and the removal of the concrete pad.	Section 5.2.1
Wildflower Society of WA (Inc.) SBWHP Community Consultative Committee	There was a concern that provisioning of revegetation funding and the lodgement of substantial bonds.	Section 5.8
Wildflower Society of WA (Inc.) Public Submission	There was a concern that the completion criteria did not address the need to reinstate the pre-mining plant biodiversity and that the final completion criteria should be applied to the whole site.	Section 3.2
Wildflower Society of WA (Inc.)	There was a suggestion that some of the permanent vegetation monitoring plots should be located within the SBWHP.	Section 6.3.2

4.3.2 Review of the Draft Preliminary Closure Plan

Ministerial Condition 13-1 requires that the Preliminary Closure Plan be prepared to meet the requirements of the Minister for the Environment on advice of the EPA. In addition, the conditions state that the EPA expects that the advice of the following agencies will be obtained:

- DEC (formerly the Department of Conservation and Land Management);
- DoIR; and

-
- DoW.

To obtain advice from these stakeholders, a draft Preliminary Closure Plan was submitted to the above agencies for review. Feedback from these agencies was addressed during the preparation of this version of the Preliminary Closure Plan prior to submission to the DEC Statement Management Section.

Documentation on the comments received from the DEC, DoIR and DoW, and the way in which these comments have been addressed, has been submitted to the DEC Statement Management Section under separate cover. It is understood that the DEC Statement Management Section will consult with the EPA to obtain its input on this version of the MP.

The final MP will be prepared following receipt of comments from the EPA and will be submitted to the EPA through the DEC Statement Management Section and the DEC Audit Branch for sign-off.

5.1 Domains

There is a trend in mine closure planning to segregate the mine site into “domains”, which are land management units within a mine site. Domains tend to have similar geophysical characteristics and environmental issues. Therefore, the nature of decommissioning, remediation and rehabilitation activities would also be similar. The domains that are expected to exist at the Coburn Mineral Sand Mine at the time of closure are as follows:

- Processing plant.
- Workshops and hydrocarbon storage areas.
- Pits and tailings disposal areas.
- Roads.
- Camp, office accommodation areas.
- Water bores and associated infrastructure.

The development of these domains assumes that disturbances or areas developed early in Project life (such as borrow pits, initial overburden dump and initial tailings dump) have been progressively rehabilitated.

5.2 Processing Plant

5.2.1 Description and Closure Issues

The processing plant (concentrator) will comprise a primary concentration circuit, a secondary concentration circuit and a non-magnetic upgrade circuit. The processing plant consists of a series of modules that are secured together. The plant has interconnecting walkways and pipework. There will not be a requirement for the processing plant to have a concrete foundation because it will be mounted on skids. The skids also allow for the easy manoeuvring of the plant, which is a critical factor for the wet concentrator plant, as it will be relocated approximately every two years.

The main issues associated with the processing plant are as follows:

- There is the potential for soil contamination within the processing plant area from tailings spillages.
- There is the potential for wind-blown dust to occur when the mined ore is transported by a conveyor system to an in-pit screening module. Although the occurrence of this would be low, there may be a requirement for remediation activities.

-
- The soil in this area would be compacted and have poor structure. This results in low infiltration and the potential for increased surface runoff and erosion.

5.2.2 Decommissioning

The decommissioning activities for the processing plant would comprise the following:

- Identify all infrastructure and services that Gunson owns or has responsibility for, and establish an assets register.
- Determine whether any other parties have requested handover of infrastructure at closure.
- Disconnect and terminate all services.
- Dismantle and remove the processing plant. Determine the fate of the infrastructure (sell or recycle). The material will only be buried if no other option is available.
- Dismantle and remove the conveyor.

5.2.3 Decontamination

As indicated in Section 5.2.1, there is the potential for soil contamination to exist within the processing plant area due to the potential tailings spillages and dust generation from the conveyor. Other contaminants such as hydrocarbons may also be present. The main decontamination activity that would be required would be to remove contaminated material (spillage or otherwise) from the footprint of the processing plant, stockpiles and conveyors. Any remediation that is deemed to be required will be conducted prior to, or at, closure.

5.2.4 Revegetation

The rehabilitation and revegetation activities for the processing plant would involve the following steps:

- Re-establish natural drainage patterns, by re-profiling the land to pre-disturbance landforms as much as possible.
- Relieve compaction by deep ripping. Ripping should be conducted along the contour to minimise erosion.
- Re-spread vegetation material, topsoil (approximately 100 mm) and subsoil that has been stockpiled from previous clearing activities. One of the aims of re-spreading vegetation is to provide microhabitats for local fauna.

-
- Conduct seeding to improve the rate and success of revegetation. Seeding may be done by hand or with a commercially available seeder. Local provenance seed incorporating local priority species will be used wherever possible.
 - Erect appropriate signage to advise that rehabilitation is in progress and personnel are not permitted to enter the area.

5.2.5 Maintenance

There may be a need to conduct maintenance and implement corrective measures if rehabilitation does not achieve nominated completion criteria. The remedial activities that are likely to be undertaken in the event that the rehabilitation performance is poor are as follows:

- If local species cannot provide adequate cover it may be necessary to sow a cover crop to protect the soil. The crop would be an infertile annual species that will die off after a one-year period and not reproduce. The cover crop would provide initial assistance for the native species by increasing protection against wind and water erosion.
- An emulsion may be used to seal the soil surface to help protect against erosion. Vegetation can grow through the soil stabiliser prior to it weathering to produce an inert crust.
- Fertiliser may be used to increase the germination and growth rates of vegetation during early years of revegetation.
- Windbreaks may be established to provide wind protection to seedlings as well as catching dew and providing the seedlings with an additional source of moisture.
- Herbivore-proof fencing may need to be erected around rehabilitation zones to protect seedlings from grazers if grazing pressure is found to significantly affect regrowth.
- Weed control may be required if weed species are found to negatively affect the growth of native species on disturbed sites. A range of herbicides are available and will be assessed during the rehabilitation research and development programme.
- Remedial works may also include management of over-representation of species, which may require infilling of particular species to increase plant density and floristics.

5.3 Workshop and Hydrocarbon Storage Areas

5.3.1 Description and Closure Issues

The workshop area will include hydrocarbon storage facilities. The hydrocarbon storage facilities will be designed in accordance with Australian Standard AS1940-2004.

The main issues associated with the workshop and hydrocarbon storage areas are as follows:

- Soil and groundwater contamination by hydrocarbons may have occurred during re-fuelling, fuel distribution activities and vehicle servicing.
- There is the potential for surface water contamination by residual hydrocarbons remaining from re-fuelling, fuel distribution activities and vehicle servicing.
- The soil in this area would be compacted and have poor structure. This results in low infiltration and the potential for increased surface runoff and erosion.

5.3.2 Decommissioning

The decommissioning activities for the workshop and hydrocarbon storage areas would comprise the following:

- All services will be disconnected and terminated.
- The workshop will be dismantled and removed. All machinery will also be removed from site.
- The concrete pad which was established for the workshop will be excavated, broken up and buried on-site.
- All inert scrap material and parts not suitable for re-use or recycling will be either buried or taken off-site for disposal in landfill.
- To prevent contamination, any hydrocarbons in the base of bunds will be pumped out prior to removal, for appropriate disposal off-site.

5.3.3 Decontamination

The decontamination activities for the workshop and hydrocarbon storage areas would comprise the following:

- Any hydrocarbon-contaminated soil would be removed or remediated prior to revegetation activities taking place.
- Groundwater remediation may be required if hydrocarbons have reached the groundwater.
- Any surface water contamination would be treated as part of the soil remediation programme.

5.3.4 Revegetation

The rehabilitation and revegetation activities for the workshop and hydrocarbon storage areas would involve the following steps:

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- Re-establish natural drainage patterns, by re-profiling the land to pre-disturbance landforms as much as possible.
 - Relieve compaction by deep ripping. Ripping should be conducted along the contour to minimise erosion.
 - Re-spread vegetation material, topsoil (approximately 100 mm) and subsoil that has been stockpiled from previous clearing activities. One of the aims of re-spreading vegetation is to provide microhabitats for local fauna.
 - Conduct seeding to improve the rate and success of revegetation. Seeding may be done by hand or with a commercially available seeder. Local provenance seed incorporating local priority species will be used wherever possible.
 - Erect appropriate signage to advise that rehabilitation is in progress and personnel are not permitted to enter the area.

5.3.5 Maintenance

There may be a need to conduct maintenance and implement corrective measures if the rehabilitation performance does not achieve nominated completion criteria. The remedial activities that are likely to be undertaken in the event that the rehabilitation performance is poor would be the same as described in Section 5.2.5.

5.4 Pit and Tailings Disposal Areas

5.4.1 Description and Closure Issues

All pits will be rehabilitated prior to closure, except for the final pit (Pit 9), which may be partially rehabilitated. The rehabilitation of all the other pits and tailings disposal areas will be progressively rehabilitated as part of the Progressive Rehabilitation Programme (including Soil, Revegetation and Weed management plans).

The final pit will be approximately 6 km long and 1 km wide. The depth of the pit would be between 5 m at the southern end of the pit to about 30-40 m in the middle of the pit. Access to the pit floor will be via a ramp along the batter of the mine void. The ramp will have a slope of 1:10 (5.7°) and be constructed of oversize from the in-pit screener.

The reconstructed landforms are created through the rehabilitation of the pits, where overburden is placed directly into the bottom of the mined-out area(s). Sand tailings from the concentrator will also be returned to the mined-out area(s). Bulldozers will then be used to contour the tailings into the required landforms. Approximately 900 mm of subsoil will be spread on top of the sand tailings by bulldozer.

Topsoil will be spread over the subsoil to a depth of approximately 100 mm. Cleared vegetation will be placed on the reconstructed landforms to provide niches for seed and prevent erosion.

Clay fines or “slimes” will be placed in trenches on the eastern side of the pits. It is anticipated that the fines will take time to dry sufficiently before tailings, subsoil and topsoil can be placed on them. For this reason, some stockpiles of subsoil and topsoil will need to be retained on the outside edge of the slimes trench, for use in rehabilitation as the slimes dry.

The main issues associated with the pit and the reconstructed landforms are as follows:

- The backfilling of the pit with overburden and tailings creates a reconstructed soil profile that has different soil characteristics to the pre-disturbance soil profile. These characteristics could affect the success of the rehabilitation.
- There is a low level of radiation due to the presence of minor monazite in the mineral sands. Therefore, there is the potential for the formation of radiation ‘hot spots’ when returning sand tailings to the mine void if the material is not distributed over a larger area.
- There is potential for erosion from the reconstructed landforms prior to vegetation becoming established.
- The drainage pattern formed by the reconstructed landforms could be different to the pre-disturbance drainage pattern and this could have adverse impacts on vegetation due to interruption of drainage.

5.4.2 Revegetation

As described in Section 5.4.1, the rehabilitation of the pits and hence the creation of the reconstructed landforms would include the following steps:

- Overburden is placed directly into the bottom of the mined-out area(s) by conveyor.
- Sand tailings from the concentrator will be returned to the mined-out area(s).
- Bulldozers will then be used to re-profile the tailings into the required landforms. Natural drainage patterns will be re-established where possible by re-profiling the land to create a landform as close as possible to the surrounding undisturbed landforms.

The reconstructed landforms would be rehabilitated as follows:

- Approximately 900 mm of subsoil will be spread on top of the sand tailings by bulldozer.
- Topsoil will be spread over the subsoil to a depth of approximately 100 mm.
- Cleared vegetation will be placed on the reconstructed landforms to provide niches for seed, prevent erosion and provide microhabitats for local fauna.

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- Topsoil and subsoil will be ripped to a depth of 500 mm to assist in the re-establishment of vegetation. Ripping should be performed by a multi-tyred dozer, and will not extend into the sand tailings horizon. Ripping should be conducted along the contour to minimise erosion and should be done during dry conditions to minimise compaction, where possible.
 - Conduct seeding to improve the success and rate of revegetation. Seeding may be done by hand or with a commercially available seeder. Areas will initially be seeded with species known to be successful colonisers. Seeds of species that prefer more established ecosystems (late successional species) will be introduced into the rehabilitation areas once an initial vegetation cover has been established. Local provenance seed incorporating local priority species will be used wherever possible.
 - Erect appropriate signage to advise that rehabilitation is in progress and personnel are not permitted to enter the area.

5.4.3 Maintenance

There may be a need to conduct maintenance and implement corrective measures if rehabilitation does not achieve nominated completion criteria. The remedial activities that are likely to be undertaken in the event that the rehabilitation performance is poor would be the same as described in Section 5.2.5.

5.5 Roads

5.5.1 Description and Closure Issues

There will be an access road connecting the Project Area with the North West Coastal Highway. It will be a two-lane sealed road constructed of crushed and compacted calcrete. It is anticipated that this access road would remain after closure. However, this would need to be confirmed with the future pastoral lease holder for the Coburn Pastoral Lease and the Meadow Pastoralist as the road traverses these two leases.

Haul roads will be constructed from the site offices to the pits. There will also be roads that connect the mine areas and concentrators to the main haul road.

There are existing access tracks associated with the initial exploration activities. These tracks will be used to gain general access to the orebody and water bores. Tracks and roads that are not required for the mining operation or for ongoing fire or weed management will be rehabilitated progressively as part of the Progressive Rehabilitation Programme.

The main issues associated with the roads are as follows:

- The roads and tracks may provide third party access to the site, if the roads are not made secure.

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- The access tracks would be compacted and the soil would have poor structure. This results in low infiltration and the potential for increased surface runoff and erosion.
 - There is the potential for wind-blown dust to occur from the roads at the time of closure.
 - The roads could have altered the pre-disturbance drainage pattern which could have adverse impacts on vegetation due to interruption of drainage.

5.5.2 Revegetation

The rehabilitation and revegetation activities for the roads would involve the following steps:

- Re-establish natural drainage patterns, where possible.
- Relieve compaction by deep ripping to increase infiltration, reduce erosion and create niches for seeds to settle.
- Re-spread vegetation material and topsoil (approximately 100 mm) that has been stockpiled from previous clearing activities. One of the aims of re-spreading vegetation is to provide microhabitats for local fauna.
- Conduct seeding to improve the success and rate of revegetation. Seeding may be done by hand or with a commercially available seeder. Local provenance seed incorporating local priority species will be used wherever possible.
- Erect appropriate signage to advise that rehabilitation is in progress and personnel are not permitted to enter the area.

5.5.3 Maintenance

There may be a need to conduct maintenance and implement corrective measures if rehabilitation does not achieve nominated completion criteria. The remedial activities that are likely to be undertaken in the event that the rehabilitation performance is poor would be the same as described in Section 5.2.5.

5.6 Camp, Office and Accommodation Areas

5.6.1 Description and Closure Issues

The camp will comprise accommodation units that can withstand strong winds. The transportable units may be constructed on pre-cast concrete floors.

The accommodation area will have a landscaped courtyard. There will also be a camp administration office, amenities building, kitchen, dining facility, cool and cold rooms, recreation area, gym, laundry, TV/Reading room, tennis/basketball/volleyball court, workshop, office and stores area.

The mine office, store and workshop will be located several kilometres to the north of the accommodation camp, next to the power station. A desalination plant and wastewater treatment plant will also be established near the mine office. The desalination plant will provide potable water for the camp and offices. The wastewater plant and sewage system near the camp will provide grey water to reticulate around the camp for landscaping purposes.

An onsite landfill will be used for domestic waste such as general refuse, green waste, paper and putrescibles. Where possible, recyclable wastes will be collected separately and transported off-site to a recycling facility.

The main issues associated with the accommodation areas, office/power plant complex and landfill are as follows:

- Potential soil and groundwater contamination by hydrocarbons and untreated wastewater may have occurred.
- There is the potential for surface water contamination by residual hydrocarbons.
- The soil in this area would be compacted and have poor structure. This results in low infiltration and the potential for increased surface runoff and erosion.
- There will be a requirement to remove the concrete pads associated with the accommodation units, and, if required tennis/basketball/volleyball court.

5.6.2 Decommissioning

The decommissioning activities for the accommodation area and office/power station complex would comprise the following:

- Identify and document all infrastructure and services that Gunson owns or has responsibility for, and establish an assets register.
- Determine whether any other parties have requested handover of infrastructure at closure.
- Disconnect and terminate all services.
- Demolish and remove small buildings and tanks. Determine the outcome of the infrastructure (sell, recycle or bury etc.).
- The concrete pads for the accommodation units and court will be excavated, broken up and buried on-site.

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- All inert scrap material and parts not suitable for re-use or recycling will be either buried or taken off-site for disposal in landfill.

5.6.3 Decontamination

The decontamination activities for the accommodation area would comprise the following:

- Any hydrocarbon-contaminated soil would be removed or remediated prior to revegetation activities taking place.
- Groundwater remediation may be required if hydrocarbons or untreated wastewater have reached the groundwater.
- Any surface water contamination would be treated as part of the soil remediation programme.

5.6.4 Revegetation

The rehabilitation and revegetation activities for the accommodation areas and office/power station complex would involve the following steps:

- Re-establish natural drainage patterns, by re-profiling the land to pre-disturbance landforms as much as possible.
- Relieve compaction by deep ripping. Ripping should be conducted along the contour to minimise erosion.
- Re-spread vegetation material, topsoil (approximately 100 mm) and subsoil that has been stockpiled from previous clearing activities. One of the aims of re-spreading vegetation is to provide microhabitats for local fauna.
- Conduct seeding to improve the rate and success of revegetation. Seeding may be done by hand or with a commercially available seeder. Local provenance seed incorporating local priority species will be used wherever possible.
- Erect appropriate signage to advise that rehabilitation is in progress and personnel are not permitted to enter the area.

5.6.5 Maintenance

There may be a need to conduct maintenance and implement corrective measures if rehabilitation does not achieve nominated completion criteria. The remedial activities that are likely to be undertaken in the event that the rehabilitation performance is poor would be the same as described in Section 5.2.5.

5.7 Water Bores and Dam

5.7.1 Description and Closure Issues

A series of production bores will be developed for the mining operations. For the first two years of mining, there will be a requirement for up to four bores, each supplying approximately 100 L/second. The production bores will be spaced to avoid aquifer interference with each other and will pump continually into a lined dam adjacent to the plant.

The main issues associated with the water bores and dam are as follows:

- Unsealed, abandoned bores are a potential hazard to fauna, and public health and safety. Abandoned bores are also a hazard to the preservation of the quantity and quality of the groundwater resource. However, this is not likely to be an issue as bores constructed for the Project will have properly constructed headworks, as required under the Licence to Construct that is issued by the DoW.
- An improperly abandoned bore hole might serve as an uncontrolled invasion point for contaminated and polluted water.
- The dam could form a potential hazard to fauna and public health and safety.

5.7.2 Decommissioning

There may be a requirement by pastoralists or other parties to retain the bores. However, this closure plan assumes that all bores will be decommissioned. The decommissioning of the water bores would be conducted in accordance with the Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ) (2003) *Minimum Construction Requirements for Water Bores in Australia*. There are several requirements that need to be taken into account when sealing an abandoned water bore. These include the following:

- Elimination of any physical hazard;
- Prevention of groundwater contamination;
- Conservation of yield and maintenance of hydrostatic head of aquifers; and
- Prevention of the intermingling of desirable and undesirable waters.

ARMCANZ (2003) states that the minimum requirements for the permanent decommissioning of a water bore are as follows:

1. **Sealing:** The bore would be completely sealed and filled to prevent the vertical movement of water within the bore and ensure that the water is permanently confined to the specific zone in which it originally occurred. The sealing material should not have any potential health risk and should be

more impervious than the material encountered during the drilling of the bore. Bores would be filled, plugged and sealed.

2. **Sealing materials and placement:** Concrete, cement grout, or bentonite grout would be used as primary sealing materials. The sealing material would be placed from the bottom upward by methods that would avoid segregation/dilution of material and unnecessary contamination of the aquifer zone.
3. **Fill materials and placement:** Fill material would consist of clean or disinfected sand, coarse stone, clay or drill cuttings.
4. **Surface caps:** All bores would be sealed with concrete, cement grout or bentonite cement grout from a depth of 5 m to the surface, or to 300 mm below the surface where a native soil topping is required. The soil topping would be compacted and mounded to prevent ponding of surface water above the bore.
5. **Grout bridges:** Although it is preferable to completely grout bores, bridges may be used in bores where this is not practicable. A minimum of 10 m of cement grout plug would be set for a bridge. Bridges would be set in impermeable strata immediately above and below each aquifer formation in the bore.
6. **Surface casing:** Surface casing that is in good condition would be bridged (in accordance with No. 5) with cement grout at the casing shoe and at the top of the casing.
7. **Single rock type sites:** Bores that intersect only one rock type would be sealed to prevent entry of water and objects down the borehole.
8. **Multiple rock types:** Sealing of single confined and multiple aquifer systems shall confine water to the aquifer in which it occurs. The bore would be sealed over its entire length, or selectively sealed, plugged, filled and surface capped.
9. **Records:** Complete and accurate records would be kept of the entire decommissioning procedure for future reference and to verify that the hole was properly sealed. Details of bore cementing would be recorded on a bore completion report.

The decommissioning and rehabilitation of the final process water (or raw water) dam would involve the following steps:

- Allow the water within the process water (or raw water) dam to evaporate prior to removal of the liner.
- Remove the liner and sell if possible. If liner cannot be re-sold, puncture, fold and bury the liner in the dam, ensuring that it does not form a barrier to vertical percolation.
- Re-profile the affected area to ensure that the area is self-draining, as far as is practicable.

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- Relieve compaction by deep ripping. Ripping should be conducted along the contour to minimise erosion.
 - Re-spread vegetation material, topsoil (approximately 100 mm) and subsoil that has been stockpiled from previous clearing activities.
 - Conduct seeding to improve the rate and success of revegetation. Seeding may be done by hand or with a commercially available seeder.
 - Erect appropriate signage to advise that rehabilitation is in progress and personnel are not permitted to enter the area.

5.8 Closure Costs and Provisioning

The ANZMEC/MCA (2000) *Strategic Framework for Mine Closure* states that financial provisioning for closure is required to ensure that there are adequate funds available at the time of closure so that ongoing environmental problems are avoided. Australian companies are required to comply with AASB 137 “Provisions, Contingent Liabilities and Contingent Assets”, where the rehabilitation and closure costs are recorded as a liability in the company’s financial statement (Department of Industry, Tourism and Resources, 2006).

As part of the approval for the Project under the *Mining Act 1978*, DoIR will set the performance bonds and Gunson is likely to use unconditional bank guarantees to cover the bond amounts. Gunson will also undertake a costing exercise within the first year of operations to more accurately define the closure costs associated with the Project.

6.1 Groundwater Management and Monitoring

6.1.1 Issues

A series of hydrogeological investigations have been conducted on the groundwater systems within the Project Area as part of the PER (URS, 2005a). The key findings of the groundwater impact assessment indicate that the predominant environmental issues and potential risks include:

- Mounding of the water table in the superficial formations, due to disposal of sand and slimes tailings in slurry form, to within the root zones of vegetation stands;
- The transport and fate within the superficial formations of residual process waters not recovered from the disposed sand and slimes tailings, given the water table aquifer would discharge in part into salina domain in foreshore areas of the Nilemah Embayment and Hamelin Pool;
- Drawdown impacts within the superficial formations resulting from pit dewatering in the northern Project Area;
- Drawdown impacts within the confined aquifer systems due to large-scale abstractions from the Birdrong Sandstone and Kopke Sandstone for process water supplies;
- Removal from storage of groundwater in the regional confined aquifer systems due to rates of forecast abstractions exceeding the estimated recharge and throughflow beneath the Project Area;
- Potential for propagation of drawdown impacts from the regional confined aquifer systems into the water table aquifer systems; and
- Temporary deficits in recharge compared to abstraction and consequent removal of groundwater from storage in unconfined zones of the regional aquifer systems.

6.1.2 Management

The management actions that are proposed to minimise the long-term effects of groundwater extraction are as follows:

- Installation of multipiezometers in the superficial formations and shallow Toolonga Calcilutite to provide data for managing the following key aspects:
 - Optimisation of water recovery;
 - Managing areas with potential risk to vegetation root zones; and
 - Shallow water table environment in the Nilemah Embayment area.

- Where appropriate, maintain active drains in the pit(s) adjacent to areas at risk in order to intercept and abstract tailings water locally contributing to the mounding;
- Installation of multipiezometers in the confined aquifers and confining layers to measure impacts and determine long-term hydraulic responses;
- Monitoring process water supply extraction and movements within the mine water circuits to maintain tight control over usage patterns and make-up requirements; and
- Monitoring water levels in selected private bores in the region for drawdown impacts and salinity for quality considerations.

Further details of the proposed groundwater management procedures can be found in the Groundwater Mounding Management Plan.

6.1.3 Monitoring

Groundwater monitoring programmes have been developed for the operational phase of the Project to enable assessment and management of the shallow aquifers due to mine dewatering, residual mounding of the water table in the superficial formations and drawdown in the confined aquifers due to process water supply abstraction. Some of the operational monitoring programme would be continued through to closure and it is expected that the monitoring that would be undertaken during the closure process would be as outlined in Table 6.

Table 6
Post-Closure Groundwater Monitoring

Monitoring	Parameters	Monitoring Frequency
Local Superficial Formations Multipiezometers <ul style="list-style-type: none"> • SMB2 to SMB4. • Additional Long-Term Multipiezometers SMB5 to SMB12. • Additional Vegetation Monitoring Multipiezometers VMB1 to VMB19. • Nilemah Embayment Monitoring Multipiezometers NMB1 to NMB13 to the north of the Project Area. 	Groundwater Levels. Groundwater Quality: pH, EC, TDS. Groundwater Quality: pH, EC, TDS, Total Alkalinity, Total Hardness, Cl, CO ₃ /HCO ₃ , SO ₄ , NO ₃ , NO ₂ , Na, K, Ca, Mg, Fe, SiO ₂ , Al, Mn, As, Cd, Cu, Pb, Se and Zn.	Monthly Quarterly Annually
Regional Piezometers <ul style="list-style-type: none"> • Existing Nilemah Artesian No.1A, Coburn No.4, Hamelin MRD Bore, Hamelin 26 (SB1), and Meadow 5(old). • Additional Multipiezometers DMB2 to DMB7 and IMB1 to IMB4. 	Groundwater Levels or Pressures (artesian bores). Groundwater Quality: pH, EC, TDS (artesian bores).	Monthly Quarterly

Table 6 (continued)

Monitoring	Parameters	Monitoring Frequency
Reporting	Preparation of Aquifer Reviews that detail the operational and technical aspects of the Project. It is important that the Aquifer Reviews provide definitive assessments and reviews of: <ul style="list-style-type: none"> • Residual mound distributions. • Refinements on the fate and potential impacts of the residual tailings waters. • Recovery of the confined aquifer systems. • Impacts of drawdown on other groundwater users. 	Annual for at least 5 years after mining

6.2 Surface Water Management and Monitoring

6.2.1 Issues

The results of the investigation undertaken for the PER (URS, 2005a) indicate that there are no defined watercourses, permanent fresh-water bodies, or birridas within the Project Area. The potential impacts have been identified as localised to the Project Area and are readily manageable.

6.2.2 Management

Surface water management would mainly comprise the containment of runoff from the infrastructure areas. Gunson would implement the following surface water management measures:

- Surface water runoff from roads and other non-contaminated hard surfaces would be channelled into a sediment retention basin, stored and allowed to evaporate. The sediment retention basins would be regularly maintained.
- Surface water runoff from areas where runoff may be potentially contaminated (i.e. fuel storages) would be channelled into a separate retention ponds and allowed to evaporate or be treated.
- Surface water drainage systems would be designed to capture and manage heavy rainfall events.

6.2.3 Monitoring

As there are no permanent surface water features within the Project Area, there is no need to undertake an extensive surface water monitoring programme. At closure, there may be a requirement to conduct water quality (oil and grease, pH and TDS) monitoring of the retention ponds.

6.3 Rehabilitation Performance Monitoring

6.3.1 Landscape Function Analysis

Landscape Function Analysis (LFA), which was developed by Tongway and Hindley (2004), is a monitoring programme that has successfully been used for measuring mine site rehabilitation success. LFA may be used to monitor the health and functionality of soils and vegetation at the landscape scale.

6.3.2 Vegetation Monitoring

The vegetation monitoring programme would include measuring the abundance and diversity of plants that return on rehabilitated areas. Permanent vegetation plots would be established in rehabilitated areas and also in undisturbed areas, including within the SBWHP. The results from the rehabilitated plots would be compared with the baseline results and the undisturbed plots.

6.3.3 Fauna Monitoring

Permanent fauna monitoring plots would be established in rehabilitated and undisturbed areas in order to monitor whether fauna are returning to and utilising the rehabilitated land.

6.4 Reporting Procedures and Schedule

Comprehensive records of the planning and implementation of all rehabilitation and closure works would be maintained for each domain and would include:

- Data on the pre-disturbance condition of each site to be collected as part of the Progressive Rehabilitation Programme.
- An assets register of all infrastructure and services that Gunson owns or maintains responsibility.
- Information on the vegetation, topsoil and subsoil removal, handling and storage techniques used.
- Details on the rehabilitation treatment(s) used (i.e. rehabilitation earthworks, seed bed preparation, species used in the seeding programme, seed treatment and any fertiliser/soil amendments).
- The results of the rehabilitation monitoring programme.

- The scope of any remedial work (e.g. re-ripping, re-seeding and weed control).

It is proposed that the Preliminary Closure Plan would be updated after the first two years of mining, then on an annual basis thereafter. Review of the closure plan is the responsibility of the Managing Director. Any progress made in planning for, and working towards, closure would be reported within the Annual Environmental Report (AER) required under Ministerial Condition 13-8.

In accordance with Ministerial Condition 13-4, Gunson would prepare a Final Closure Plan at least three years prior to the anticipated date of closure or at a time agreed with the EPA.

The documentation required for each stage in planning for, and implementing, site closure is listed in Table 7.

Table 7
Documentation Relevant to Stages of Site Closure

Stage	Documentation
Project planning and development	<ul style="list-style-type: none"> • PER and Mining Proposal that includes commitments to mine closure and draft completion criteria. • Preliminary Closure Plan.
Operations	<ul style="list-style-type: none"> • Report on progress made in planning for, and working towards, site closure in AERs. • After two years of mining, and then on an annual basis, review and update the Preliminary Closure Plan.
Three years prior to closure or at a time agreed with the EPA	<ul style="list-style-type: none"> • Prepare the Final Closure Plan.
Site closure	<ul style="list-style-type: none"> • Update and implement the Final Closure Plan. • Report on progress in AERs.
Care and maintenance	<ul style="list-style-type: none"> • Report on progress of site closure in AERs.
Relinquishment	<ul style="list-style-type: none"> • Written sign-off by DoIR and other decision-making authorities. • Deletion of fulfilled tenement conditions from the mining leases. • Retirement of bonds.

7.1 Overview

There may be a number of unforeseen circumstances that could lead to temporary or unplanned closure (care and maintenance), such as changes in commodity markets and changes in company finances. Typically operations would be expected to recommence, but if circumstances remain adverse to the re-opening of the mine, then an accelerated closure process would need to be implemented. In these circumstances, a decommissioning and closure plan would be prepared and implemented based on the most current closure plan for the Project.

The Project could also be put on care and maintenance just prior to closure as part of the mine project life cycle. During the care and maintenance phase of the Project, Gunson recognises that it will still need to meet ongoing environmental obligations. Therefore, it is necessary to have a care and maintenance plan for the processing plant and the management of all environmental aspects of the site during this phase. It is also essential that public safety is considered during the care and maintenance phase. Section 7.1.2 provides a framework for a care and maintenance contingency plan.

7.2 Contingency Plan

When a decision has been made to place the site on care and maintenance, the following steps will be undertaken as part of the contingency plan for the care and maintenance phase:

- Undertake an environmental audit of the site to determine the status (environmental risk) of all components of the site.
- Develop a care and maintenance plan to manage/ameliorate the following environmental risks:
 - The processing plant could contain significant volumes of process-related materials when care and maintenance are initiated. There is the potential for the materials to cause soil, groundwater or surface water contamination if these are not stored or disposed of correctly.
 - The hydrocarbon storage areas could cause soil, groundwater or surface water contamination and also have adverse effects on vegetation and human health if the hydrocarbons are not stored in appropriate containers or disposed of correctly.
 - The reconstructed landforms and pits that are un-rehabilitated could cause environmental risks, such as erosion and sedimentation, which could have adverse effects on surrounding vegetation.
- Establish an emergency response action plan, if monitoring indicates that there is a potentially serious environmental problem. If a catastrophic event does occur, it is essential that there is a plan in place to minimise injury and damage.
- Regular monitoring and reporting to the DoIR and other government agencies carried out during operations will need to be continued through the care and maintenance stage.

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The methodology adopted and sources of information used by URS are outlined in this report. URS has made no independent verification of this information beyond the agreed scope of works and URS assumes no responsibility for any inaccuracies or omissions. No indications were found during our investigations that information contained in this report as provided to URS was false.

This report was prepared between June and November 2006 and is based on the information reviewed at the time of preparation. URS disclaims responsibility for any changes that may have occurred after this time.

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