



3.1.1 Criteria of assigning significance to potential impacts

The impact assessment methodology used is presented in Appendix 12.

3.1.2 Potential impact of each main activity

The potential impact of each main activity, is discussed in detail in Section 2.2 above.

3.1.3 Assessment of potential cumulative impacts

The assessment of potential cumulative impacts was included in the overall significance rating for the impacts of the proposed Sebilo Perth Mine. These are summarised in Table 54, where cumulative impacts are indicated as (Cu).

3.2 Proposed mitigation measures to minimise adverse impacts

The Environmental Management Plan (EMP) is presented in tabular format overleaf in Table 55. The EMP is based on the following:

- The management measures presented are based on the available specialist studies as discussed earlier in this report
- The main aspects from the studies and reports listed above are presented in the EMP in Table 55.
- Specific management procedures are included in Section 3.2.2 onwards. These include an Emergency Response Plan (which includes a Veld Fire Management Plan, Spill Management Plan, a Fire Risk Management Plan and a Flood Risk Management Plan), and Environmental Incident Report Sheet, Blasting Management and a Complaints Handling Procedure.





Table 55.1 Environmental Management Plan: Access and General Safety

Impact	Significance of impact	Applicable Mining Phase	Environmental Management Plan	Responsible Person	Estimated Annual Mitigation cost	Reconciliation with prescribed Standards
Access to the Mine and General Safety Conditions	<p>Initial assessment: Medium negative</p> <p>With mitigation: Low negative</p>	Operational Phase	<p>• Sebilo undertakes to operate within a well-planned mining strategy and not to disturb the topography and land unnecessarily.</p> <p>• The mining area will be fenced off and access to the operations will be restricted.</p> <p>• Sebilo will implement an inspection schedule and record all inspections undertaken at the operations.</p> <p>• Sebilo will implement a permanent security force at the operations, who will patrol the mining area on a daily basis. One of the tasks if the security force, will be to identify and remove illegal occupiers (squatters) from the project area.</p> <p>• The area to be disturbed will be kept to a minimum and where practical, additional infrastructure will be located on land previously disturbed by mining activity.</p> <p>• Existing tracks will be used during mining, as far as possible.</p> <p>• When new roads are constructed, the route shall be selected so that the minimum number of bushes and trees are felled and existing fence lines will be followed as far as possible. Routes, which cross watercourses will be avoided as far as practical.</p> <p>• Sebilo will not remove protected tree species without the necessary permits.</p> <p>• All access and haul roads will be designed and constructed with appropriate sediment and erosion control, including cut-off berms and trenches, as necessary.</p> <p>• Strict safety regulations will be implemented, including using the appropriate PPE and access conditions for private people.</p> <p>• All fire fighting equipment (see Fire Risk Management Plan in Table 57), will be on site at all times. Responsible staff will receive the necessary training to use the fire fighting equipment efficiently.</p> <p>• A 5m-fire break will be cleared of vegetation and maintained around the mining area.</p> <p>• Sebilo will make sufficient operational budget and resources available to implement the conditions of the EMP during and after mining.</p>	Project Manager ECO	<p>PPE: R3000 Fire fighting: R2000 Fire break maintenance R2000</p> <p>TOTAL: R7000</p>	<p>Planning and implementation will comply with the requirements of:</p> <ul style="list-style-type: none"> • The MPRDA and its Regulations • The NWA and its Regulations • The DWA Best Practice Guidelines • NEMA and its Regulations.
		Decommissioning and Closure Phase	<p>• Discussions will be undertaken with the landowner during the operational phase to identify access roads and other infrastructure that the landowner would like to use after mining ceases. These areas will be excluded from the rehabilitation programme and will be handed over to the landowner at closure, subject to the approval of the regulatory authorities.</p> <p>• All access and haul roads not required by the landowners will be rehabilitated during the decommissioning phase to meet the requirements of the Rehabilitation Plan in Table 67.</p> <p>• If necessary, damage to existing roads will be repaired in consultation with the landowner. Suitable material that will not pose a pollution threat, will be used to repair roads.</p> <p>• Discussions will be undertaken with the landowner regarding mine infrastructure and buildings that will be used by the landowner after closure. Structures and infrastructure not required by the landowners, will be demolished and rehabilitated according to the Final Closure Plan, which will be finalised at least 5 years before planned mine closure.</p>	Project Manager	Rehabilitation costs presented in Section 4	





Table 55.2 Environmental Management Plan: Biodiversity

Impact	Significance of impact	Applicable Mining Phase	Environmental Management Plan	Responsible Person	Estimated Annual Mitigation cost	Reconciliation with prescribed Standards
Impact on Biodiversity (vegetation, animals and conservation areas)	Initial assessment: Medium negative With mitigation: Low negative	Construction Phase	<ul style="list-style-type: none"> It is recommended that a more detailed vegetation and faunal survey is completed by a regional vegetation specialist during the optimal flowering period (April/May and August/September) prior to the commencement of the construction phase. This will allow for the identification of all species for which permits are required for their removal or destruction; to identify specimens that could qualify for plant rescue or for which seed should be obtained to assist with their re-establishment; to document qualitative and quantitative the species present; their composition and ecological drivers, to facilitate future rehabilitation of the area and to investigate the effect of cumulative impacts. 	ECO	R80 000 for the detailed fauna and flora survey	Planning and implementation will comply with the requirements of: <ul style="list-style-type: none"> The MPRDA and its Regulations The NWA and its Regulations NEMA and its Regulations. The CARA National Forests Act Provincial Nature and Environmental Conservation Ordinance National Conservation Resources Act National Environmental Management Biodiversity Act
		Operational Phase	<ul style="list-style-type: none"> Due to the untransformed nature of the landscape, new infrastructure should be kept close to existing infrastructure as practically possible, to prevent additional habitat fragmentation. The area along the western boundary is associated with a riparian wetland. It should be managed in accordance with the requirements of the National Water Act. Due to the critical function of vegetation to stabilise the soils within and arid landscape, unnecessary destruction of vegetation should be avoided at all cost. Should mining activities have a detrimental impact on the vegetation cover, steps should be taken immediately to address and stabilise it. Effective stormwater management must form a critical component of the mining operations, as unmanaged runoff will result in erosion. Sebilo will identify and manage alien invasive plants and weeds. Category 1 and 2 alien invasive species will be removed on an on-going basis and their remains will be disposed of in such a way that reproduction will be minimised or stopped. Regular monitoring (every 3 – 6 months) of roads, the drainage lines, the ultrafines facility and other areas disturbed by mining will be undertaken to identify and remove alien invasive plant species. Alien invasive plants will be eradicated either through manually uprooting smaller plants, or cutting larger shrubs and painting the stump with a systemic herbicide. Manually uprooted alien plants and other exotic plant material will be destroyed immediately to prevent further spread. Affected sites will be regularly monitored to detect regrowth or seedlings and to remove these as soon as possible. Sebilo has prohibited poaching on site. Every finding poaching will be recorded. Sebilo will further record and remove every trap found. Awareness campaigns will be undertaken on site informing staff about poaching and what to look for. Sebilo will identify and manage possible threatened or protected species on site. This will include identification of areas that provide habitat to threatened or protected faunal species and note the visual confirmation of these species on site. If conservation-important species are found, a ecologist will be consulted to determine the most suitable interventions. Where possible, Sebilo will maintain habitats suitable for species likely to occur at the operations. The Sebilo Veld Fire Management Strategy, as detailed in Table 57, will meet ecological needs as well as legislative and regulatory requirements. To facilitate baseline data collection and future monitoring, aerial photos can be considered. This information can be used to record vegetation loss, ponding, erosion and disturbance. 	ECO	Alien plant removal: R7000 Aerial photographs R5000 TOTAL: R12000	





			<ul style="list-style-type: none"> Land disturbed during mining will be rehabilitated according to the Rehabilitation Plan in Section 11.2. The Conceptual Closure Plan presented in Section 11 will be upgraded to a Final Closure Plan at least 5 years before planned mine closure. Follow-up inspections will be undertaken in terms of the Alien Invasive Species Eradication Programme after rehabilitation and appropriate remediation actions will be implemented, as required. Animal life is expected to return to active mining and mineral processing areas of the mine lease when mining activities cease. Rehabilitated areas will provide a habitat that will attract animals and birds. 	Project Manager	Rehabilitation costs presented in Section 4
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Table 55.3 Environmental Management Plan: Heritage Sites

Impact	Significance of impact	Applicable Mining Phase	Environmental Management Plan		Reconciliation with prescribed Standards
			Responsible Person	Estimated Annual Mitigation cost	
Heritage sites	Initial assessment: Low negative With mitigation: Low negative	Operational Phase	ECO	No specific costs other than maintenance included in operational budget	<ul style="list-style-type: none"> Section 3(2) of the National Heritage Resources Act
		Decommissioning and Closure Phase			





Table 55.4 Environmental Management Plan: Surface Water

Impact	Significance of impact	Applicable Mining Phase	Environmental Management Plan	Responsible Person	Estimated Annual Mitigation cost	Reconciliation with prescribed Standards
Surface water	<p>Initial assessment: High negative</p> <p>With mitigation: Medium negative</p>	<p>Construction Phase</p> <p>Operational Phase</p>	<p>• Sebilo will apply for the necessary water use licenses with Department of Water Affairs (DWA) for the activities required under the NWA.</p> <p>• Sebilo will implement a water treatment plant at the Perth operations to treat contaminated water dewatered from the existing flooded workings. The contaminated water will be treated to an acceptable standard prior to its reuse or discharge to the environment.</p> <p>• Brine from the water treatment plant will be stored in an appropriately designed brine pond that is capable of containing the total volume of brine and that will not leak into the soil or aquifers. In this regard, the brine pond must be lined with suitable material to meet these objectives.</p> <p>• Sebilo will investigate the available options to divert surface water around the mining operations and associated infrastructure, as required. The diversion will form part of the pre-feasibility stage design for the operations and must be designed based on the expected peak flow rates and volumes calculated as part of a detailed catchment study. The design of the works must be completed in conjunction with the mine planning process to ensure that the Witteegte drainage line can be reinstated and that the decline portals and open cast pit can be protected from flooding in the long-term. The Flood Risk Management Plan is presented in Table 58.</p> <p>• A more detailed mine water balance must be completed for the operations, once the sizing and design of the waste rock dump, ultrafines empoundment facility, process plant and mining areas have been finalised. Once this has been completed, a reliable source of process water supply can be secured.</p> <p>• Sediment and erosion controls will be designed an implemented to manage surface runoff from the mining and processing areas as well as the mine residue deposits.</p> <p>• Clean surface runoff will be diverted around all mining areas and dirty water will be contained in structures that comply with the requirements of GN704, to prevent and minimise contamination.</p> <p>• All process water will be contained in adequately sized dams and/or reservoirs.</p> <p>• Sufficient capacity will be created in the reservoirs used at the Plant to contain all process water. Overflow of reservoirs will not be allowed. The Plant will be operated as a closed water circuit and no discharge will be allowed.</p> <p>• All chemicals, diesel and oils to be stored on at the Sebilo workshops in appropriately banded areas that include oil traps and stormwater management measures. The Oil and Diesel Storage Environmental Procedure in Appendix 13 must be adhered to at all times.</p> <p>• The necessary spill response kits will be kept on site and Sebilo staff will receive training on the use of the spill kits and the safe disposal of waste material.</p> <p>• Machinery and equipment will only be maintained at the workshops on a paved area with the necessary oil traps and stormwater management in place.</p> <p>• Spills will be managed according to the Spill Procedure in Table 56. Any contaminated soil will be collected into non-permeable drums and disposed of to an approved landfill site.</p> <p>• Chemical toilets will be used at the open cast operations and will be used in such a way as to prevent water pollution. Full or leaking toilets must be reported to the Supervisor for corrective action or replacement.</p>	<p>Project Manager</p> <p>ECO</p>	<p>Water Use License Application R250 000</p> <p>Detailed water balance for the operations: R50 000</p> <p>Sediment and erosion control: R20 000</p> <p>Spill kits (2): R8 000</p> <p>Stormwater management measures: R50 000</p> <p>TOTAL: R378 000*</p> <p>*The cost for the surface water diversion scheme is excluded as insufficient detail is available to cost this option at present</p>	<p>Planning and implementation will comply with the requirements of:</p> <ul style="list-style-type: none"> • The MPRDA and its Regulations • The NWA and its Regulations • The DWA Best Practice Guidelines • Government Notice 704 • The NEMA and its Regulations





Impact	Significance of impact	Applicable Mining Phase	Environmental Management Plan	Responsible Person	Estimated Annual Mitigation cost	Reconciliation with prescribed Standards
Surface water	Initial assessment: High negative With mitigation: Medium negative	Decommissioning and Closure Phase	<ul style="list-style-type: none"> • it is unlikely that the water treatment plant will be operational in the long-term, unless significant inflows or surface water into the open pit occurs. During decommissioning, the water treatment plant and associated infrastructure will be removed from site. The plant will be sold or returned to its owner, depending on the way in which it will be acquired. • The brine pond will be left to evaporate. At closure, the pond will be filled with selected waste or fines to create a domed landform, which could then be rehabilitated by covering with soil and topsoil and the establishment of vegetation to form a suitable free draining landform. • Care will be taken that no effluent of chemical substance is released into the Wittelegte drainage line and its catchment. • Stormwater will be diverted around the plant. Clean and dirty water will be separated. • All sumps, cut-off trenches and berms will be rehabilitated according to the Rehabilitation Plan in Table 67 	Project Manager	Rehabilitation costs presented in Section 4	<ul style="list-style-type: none"> • The MPRDA and its Regulations • The NWA and its Regulations • The DWA Best Practice Guidelines • Government Notice 704 • The NEMA and its Regulations





Table 55.5 Environmental Management Plan: Groundwater

Impact	Significance of impact	Applicable Mining Phase	Environmental Management Plan	Responsible Person	Estimated Annual Mitigation cost	Reconciliating with prescribed Standards
Groundwater	<p>Initial assessment: High negative</p> <p>With mitigation: Medium negative</p>	<p>Construction phase</p> <p>Operational Phase</p> <p>Decommissioning and Closure Phase</p>	<p>• Sebilco will apply for the necessary Water Use Licenses, as required.</p> <p>• Installation of surface berms and diversion trenches will reduce the surface inflows into the mining area during the operational phase. This will ensure that the volume of “dirty” water is managed effectively.</p> <p>• The surrounding aquifers will be dewatered due to mine dewatering. Groundwater seeping into the mining area will be contained and re-used as part of the mine water balance. If this water must be dewatered from the mining area, it will be pumped to the plant pollution control dam.</p> <p>• Groundwater levels will be monitored on a quarterly basis in all boreholes identified, including private boreholes.</p> <p>• It is on completion of mining operations, that a monitoring borehole is installed in the north-western corner of the rehabilitated opencast area (Coordinates: 4980E ; -3018 700N (WGS84, LO23). This borehole will serve to monitor the rate of rise and the quality of water in the rehabilitated material and serve as an early warning system. If the water level in this borehole reaches the sandy gravel lithologies, additional monitoring is implemented between the mine and the Wittege stream to monitor shallow, poor quality seepage daylighting from the sand.</p> <p>• If monitoring information indicates that mining negatively affects private borehole users, Sebilco will enter into discussions with these users to identify and implement alternative measures.</p> <p>• Groundwater quality will be monitored, according to the Monitoring Programme in Table 41, to determine the impact of mining and associated activities on the aquifers.</p> <p>• Pitwater that collects in in-pit sumps will be sampled and analysed, according to the Monitoring Programme in Table 41.</p> <p>• Appropriate seepage capture systems, like herringbone drains, should be considered as part of the design of the ultrafines impoundment facility.</p> <p>• All potential sources to groundwater contamination (see Section 3.9.7) must be quantified by a groundwater specialist to determine the need for additional groundwater monitoring around these areas. Available information suggests that most of the potential sources to groundwater identified, does not pose a significant risk.</p> <p>• Groundwater levels must be monitored on a monthly basis in all boreholes on the mine.</p> <p>• Groundwater quality must be monitored in all boreholes on the mine on a bi-annual basis.</p> <p>• All monitoring information must be entered into a database and used to analyse trends. This will allow the early detection of a decline in borehole performance as well as groundwater contamination.</p> <p>• Monitoring results must be reported to DWA and DMR on a quarterly basis.</p> <p>• Spills will be managed according to the Spill Procedure in Table 37. Any contaminated soil will be collected into non-permeable drums and disposed of to an approved landfill site.</p> <p>• The mining area will be rehabilitated according to the Rehabilitation Plan in Table 67.</p>	<p>ECO</p> <p>ECO</p>	<p>Stormwater diversion measures are currently excluded from costs. This will be confirmed once the surface water diversion scheme has been finalised</p> <p>Spill kits provided for in Surface Water Management Plan</p> <p>programme: Water Use License Application included in Surface Water Management Plan</p>	<p>Planning and implementation will comply with the requirements</p> <ul style="list-style-type: none"> • The MPRI and Regulations • The NWA and its Regulations • The DWA Best Practice Guidelines • NEMA and Regulations. • The NEMV (Act 59 of 2009) and Regulations.





Table 55.6 Environmental Management Plan: Soil, Erosion, Land Use and Capability

Impact	Significance of impact	Applicable Mining Phase	Environmental Management Plan	Responsible Person	Estimated Annual Mitigation cost	Reconciliation with prescribed Standards
Soils, Erosion, Land Use and Land Capability	Initial assessment: Medium negative With mitigation: Low negative	Operational Phase	<ul style="list-style-type: none"> • Topsoil will be stripped and stockpiled according to the Soil Stripping Plan in Section 2.1.3.1.2. • Soil boundaries of soil types that should be stripped and stockpiled separately should be staked at 50 m intervals before any soil stripping commences. • Topsoil will be adequately protected from being blown or washed away or being eroded. • Machinery and equipment will only be maintained at the contractors yard on a paved area with a suitable oil trap and stormwater management. • Controls will be implemented to minimising erosion and sediment washing from access roads and other disturbed areas. • Sediment and erosion controls may include cut-off trenches and drains, culverts for roads, rock armouring or mulching or other suitable methods identified. • Minimising the area of disturbance and timely rehabilitation will help to minimise erosion and sediment movement. • Care will be taken not to compact soil unnecessarily by minimising the construction of roads and other infrastructure only to that needed. • Monthly inspections will be undertaken of erosion and sediment controls to ensure they are effective and to determine whether maintenance work is required. • All facilities will be maintained in an adequate condition to limit the occurrence of environmental incidents. • The necessary fencing, gates, cattle control and access corridors will be implemented by Sebilo around sensitive rehabilitated areas.. • The spoils should be leveled to a free draining surface, similar to the pre-mining topography, before topsoil is replaced during rehabilitation. • Topsoil should be replaced evenly over spoils during rehabilitation at depths as specified in the Soil Stripping Plan in Section 2.1.3.1.2. • The A and B-horizons should be reconstructed in the original sequence as specified by the procedures in Section 2.1.3.1.2. • The replaced topsoil should be ameliorated according to soil analysis before seeding and re-vegetation take place. • Rehabilitated areas should be re-vegetated as soon as possible with a grass mixture dominated by local climax species in order to stabilize the soils. • Soil erosion on the rehabilitated areas should be monitored and remediate if necessary until the area can be declared as stabilized and self sustaining. • A post-mining soil depth and land capability evaluation should be done by a soil specialist registered at the Council for Natural Scientific Professions (SACNASP). A post-mining land capability map should be compiled and submitted for closure purposes 	ECO	<p>Sediment and erosion controls: R10000</p> <p>TOTAL: R10000</p>	<p>Planning will comply with the requirements of:</p> <ul style="list-style-type: none"> • The MPRDA and its regulations • The NWA and its Regulations • The DWA Best Practice Guidelines • NEMA and its Regulations. • The NEMWA (Act 59 of 2009) and its Regulations.
		Decommissioning and Closure Phase	<ul style="list-style-type: none"> • Rehabilitation costs presented in Section 4 	Project Manager		





Table 55.7 Environmental Management Plan: Air quality and Noise

Impact	Significance of impact	Applicable Mining Phase	Environmental Management Plan	Responsible Person	Estimated Annual Mitigation cost	Reconciliation with prescribed Standards
Air quality and Noise Management	Initial assessment: Medium negative With mitigation: Low negative	Construction Phase	<ul style="list-style-type: none"> Dust control programmes should contain precautions against watering programmes that confound trackout problems. Water may be combined with a surfactant as a wetting agent. This will increase the surface tension of water, thus reducing the volume of water required. Sebilo will investigate the viability of using chemical stabilisation of haul roads during the construction phase. If this option is to be implemented, the specific areas that will receive this treatment will be identified and prepared accordingly. It is however noted that this option is not cost effective for small-scale operations Sebilo will investigate and confirm whether authorisation in terms of the Air Quality Act is necessary for its operations. The following should be considered prior to the purchase of earthmoving equipment: enclosure of engine bays, modification of radiator fan design, installation of louvers on fans, re-engineering exhaust systems. Haul loads could be covered to avoid loss during transport, especially when transporting off site. Dust and mud should be controlled at vehicle exit and entry points to prevent the dispersion of dust and mud beyond the site boundary. Facilities for the washing of vehicles can be considered at entry and exit points. The predominant source of emissions at Perth Mine is crushing and screening of ore. It is recommended that dust suppression systems be fitted here, either as water sprays, or a bag filter or cyclone system. This system should also be fitted to the rail rapid load station. All stockpiles should be maintained for the shortest possible time and wind breaking enclosures should be investigated. Stockpiles should, as far as possible, be situated away from the site boundary, watercourses and nearby receptors and the location of stockpiles should take predominant wind direction into consideration. During the transfer of material to piles, drop heights should be minimised to control the dispersion of materials. All machinery used will be fitted with appropriate dust and noise suppression equipment like water sprays, silencers and mufflers. Relocate noise sources to areas which are less noise sensitive to take advantage of distance and shielding Pre-start inspections of equipment will include inspections of noise and dust control measures to ensure they are operational at all times. Blasting is to be undertaken according to the Blasting Procedure . No blasting will take place on Sundays and Public Holidays. Speed limits on gravel roads will be 40 km/hr to minimise dust and noise generation. Traffic over exposed areas should be kept to a minimum to curb dust levels. Dust will be effectively controlled in all disturbed areas through water spraying. Other means of dust suppression will be considered during the Construction Phase and implemented, if possible. Sebilo will monitor the quality of water used for dust suppression on a bi-annual basis to ensure that it does not cause a pollution hazard. Sebilo will monitor noise levels at its operations and issue hearing protection to all workers in accordance with the requirements of the MHSA. Dust levels will be monitored on mine personnel and the necessary PPE will be issued to workers in accordance with the requirements of the MHSA. Fallout monitoring should be undertaken to assess the level of nuisance dust. This monitoring must be undertaken within the neighbouring farming and community areas as well as on site. No specific management measures 	Project Manager	Watering of roads: R35 000 Occupational hygiene monitoring (noise and dust): included in operational costs Cost of PPE included in Access and General Safety Management Plan TOTAL: R35000	Planning will comply with the requirements of: • The MPRDA and its regulations • NEMA and its Regulations. • The Air Quality Act (Act 39 of 2004). • Mine Health and Safety Act (Act 29 of 1996)
		Operational Phase	<ul style="list-style-type: none"> Pre-start inspections of equipment will include inspections of noise and dust control measures to ensure they are operational at all times. Blasting is to be undertaken according to the Blasting Procedure . No blasting will take place on Sundays and Public Holidays. Speed limits on gravel roads will be 40 km/hr to minimise dust and noise generation. Traffic over exposed areas should be kept to a minimum to curb dust levels. Dust will be effectively controlled in all disturbed areas through water spraying. Other means of dust suppression will be considered during the Construction Phase and implemented, if possible. Sebilo will monitor the quality of water used for dust suppression on a bi-annual basis to ensure that it does not cause a pollution hazard. Sebilo will monitor noise levels at its operations and issue hearing protection to all workers in accordance with the requirements of the MHSA. Dust levels will be monitored on mine personnel and the necessary PPE will be issued to workers in accordance with the requirements of the MHSA. Fallout monitoring should be undertaken to assess the level of nuisance dust. This monitoring must be undertaken within the neighbouring farming and community areas as well as on site. No specific management measures 	ECO		
	Closure			NA		





Table 55.8 Environmental Management Plan: Waste

Impact	Significance of impact	Applicable Mining Phase	Environmental Management Plan	Responsible Person	Estimated Annual Mitigation cost	Reconciliation with prescribed Standards
Waste	Initial assessment: Low negative With mitigation: Low negative	Operational Phase Decommissioning and Closure Phase	<ul style="list-style-type: none"> • Mining areas will be maintained in a clean and tidy condition at all times. • All waste will be collected, separated and stored in properly constructed containers with lids and/or receptacles. • Waste will be re-used, recycled or disposed of to an approved landfill according to local municipal requirements. Full waste bins must be reported to the ECO for collection and disposal at an approved landfill. • Precautions will be taken to prevent spills and soil contamination. • The necessary spill response kits will be kept on site. • All scrap metal and other re-usable equipment will be stored in the salvage yard. Material will be sorted and stored in designated areas for re-use or to sell. No scrap metal or other old equipment may be stored or dumped outside the fence of the salvage yard. • Biodegradable waste will be disposed of to the Municipal waste disposal facility. • Chemical toilets will be kept at the opencast operations for use during mining. Flush toilets, emptying to french drains will be used elsewhere. • Diesel and oil will be stored and handled according to the Oil and Diesel Storage Environmental Procedure in Appendix 13. • Remaining refuse, chemicals, fuels and waste materials will be removed from the site following the completion of mining. Such waste will be disposed of to an approved landfill. Disposal certificates will be kept for record-keeping purposes. • The entire disturbed area will be inspected to confirm effective removal of waste. 	ECO	Spill kit provided in Surface Management Plan costs Waste disposal: R20 000 TOTAL: R20000	<ul style="list-style-type: none"> • The NEMWA (Act 59 of 2009) and its Regulations.
					Rehabilitation costs presented in Section 12	<ul style="list-style-type: none"> • The NEMWA (Act 59 of 2009) and its Regulations.





Table 55.9 Environmental Management Plan: Mine Residue Deposits

Impact	Significance of impact	Applicable Mining Phase	Environmental Management Plan	Responsible Person	Annual Mitigation cost	Reconciliation with prescribed Standards
Mine Residue Deposition	Initial assessment: Medium negative With mitigation: Low negative	Construction and Planning Phase	<ul style="list-style-type: none"> For new mine residue deposition areas (waste rock and fines), a Risk Assessment Process as required by the COP on Mine Residue Deposits, including formation of a Risk Management Team, identifying the scope for Risk Assessment, complete a Risk Analysis, develop a Risk Management Plan and documenting the process, will be compiled. The relevant investigations, studies, design and analysis required to identify and manage the associated risks, will be undertaken. These include technical reports on the design, construction and operation of the TSF, establishing a system of Maintenance and Repair, procedures for modifications, decommissioning and inspections, audit inspections by a professional engineer, development of an Emergency Preparedness Plan and procedures for re-commissioning closed or abandoned mine residue deposits 	Project Manager ECO		
		Operational Phase	<ul style="list-style-type: none"> The mine residue deposits will be managed and operated according to the DMR requirements. As part of this process, a COP for Mine Residue Deposits will be compiled and implemented. Excess water will not be allowed to accumulate in the return-water dam. Process water will be removed from the return-water dam and be recycled back to the plant. The TSF must be inspected daily to ensure that: <ul style="list-style-type: none"> The freeboard is always maintained to prevent overflow and/or spillage of ultrafine material. The fines deposition pipe does erode the upstream face of the containment walls. No erosion gullies form on the downstream side of the containment walls. Seepage appearing at the toe of the walls is noted and the responsible engineer is notified. The floating barge and pump are operating efficiently at all times. There are no leaks in the ultrafines delivery and return water pipes. Periodic inspections must be undertaken by mine personnel that are linked to the on-going risk assessment process. Inspection checklists must be drafted and agreed to between the mine, mine residue operator, professional engineer and the workers representative, as follows: <ul style="list-style-type: none"> Mine residue operator's shift mudguard – every shift Competent person designated in writing / Mine residue operator's team leader – daily Mine residue operator's supervisor – Monthly Sebio Operational Engineer, ultrafines empoundment operator area manager and professional engineer – Every three months Quarterly audit inspections to be undertaken by professional engineer and mine residue operator, with compilation of minutes. Detailed annual inspection and review of the mine residue waste site. Draft and implement an Emergency Preparedness Plan, which provides contingency plans and allocate responsibilities in the event of emergencies. Waste rock will be backfilled into mined out opencast pits as part of the concurrent rehabilitation programme. 	Project Manager Mine Residue Operator ECO	Costs for implementing the COP will be included in TSF operational budget	<ul style="list-style-type: none"> Mandatory COP on Mine Residue Deposits, Conceptual Closure Plan SANS 10286 Standard on Mine Residue Deposits
		Decommissioning and Closure Phase	<ul style="list-style-type: none"> To be developed as part of the Final Closure Plan. Final rehabilitation of the opencast mining area will take place during the decommissioning phase to reinstate the natural topography as far as possible. All rehabilitation will be undertaken according to approved plans. 	ECO	Rehabilitation costs presented in Section 4	





Table 55.10 Environmental Management Plan: Socio-economics

Impact	Significance of impact	Applicable Mining Phase	Environmental Management Plan	Responsible Person	Annual Mitigation cost	Reconciliation with prescribed Standards
Socio-economic impacts	Initial assessment Low positive With mitigation: Low positive	Construction phase	<p>• Sebilo is advised to make use of local labour as far as possible in all stages and for all aspects of the project. This applies to all contractors during construction. Liaison with local community structures and the Local Municipality will assist in identifying a local labour pool.</p> <p>• Sebilo is currently in negotiations with the landowner to purchase the farm Perth.</p> <p>• Sebilo should raise awareness amongst construction workers about local traditions and practices.</p> <p>• Sebilo should inform local businesses about the expected influx of construction workings so that they can plan for extra demand.</p> <p>• Sebilo should ensure that local community communicates their expectations of construction workers' behaviour with the construction sub-contractor, and to formalise a written agreement between the community and the sub-contractor.</p> <p>• Sebilo should ensure that employment procedure/policy is communicated to local stakeholders, especially the landowner.</p> <p>• Sebilo to consider the establishment of a Monitoring Forum (MF) in order to monitor the construction phase and the implementation of the recommended mitigation measures. Forum should comprise of representatives from local communities, local municipality, landowner and contractor(s)</p> <p>• Sebilo and the contractor(s) should, in consultation with representatives from the MF, develop a code of conduct for the construction phase. The code should identify which types of behaviour and activities are not acceptable.</p> <p>• Sebilo to consult with local South African Police Services to establish standard operating procedures for the control and removal of loiterers at the construction site.</p> <p>• Construction workers should be clearly identifiable by wearing proper construction uniforms displaying the logo of the construction company.</p> <p>• The movement of construction workers on and off the site should be closely managed and monitored by the contractors. Contractors should therefore be responsible for making the necessary arrangements for transporting workers to and from site over weekends or after hours.</p>	Project Manager		Planning will comply with the requirements of: <ul style="list-style-type: none"> • The MPRDA and its regulations • NEMA and its Regulations.





Impact	Significance of impact	Applicable Mining Phase	Environmental Management Plan	Responsible Person	Annual Mitigation cost	Reconciliation with prescribed Standards
Socio-economic impacts	Initial assessment Low positive With mitigation: Low positive	Operational phase Decommissioning and Closure Phase	<p>The Perth Social and Labour Plan provides adequate measures to establish and develop local SMEs and integrate them within the proposed mine's supply chain</p> <ul style="list-style-type: none"> The Perth Social and Labour Plan provide a five year plan for Local Economic Development, comprising three individual projects, in the neighbouring communities. Sebilo is advised to avoid handing out cheques or making random payments towards social causes and requests. A strategic approach is required to guide the company on these matters. The Perth Social and Labour Plan provide adequate measures to train and develop employees. Maintain good relationships with local authorities and ensuring prompt payments of rates and taxes will minimise any stakeholder risks and further ensure that the municipality is in the position to provide much needed basic services. Continues engagement with the Traditional Authority will be important to build trust and understanding. The 10 year development plan for the Bathharo will further investigate these challenges and concerns. Conduct detailed socio-economic assessments five years before mine closure to determine the impacts and develop mitigatory measures. Capacity building and skills training among employees are critical and would be highly beneficial to those involved, especially if they receive portable skills to enable them to also find work elsewhere and in other similar environments The Perth Social and Labour Plan provides mechanisms and strategies to prevent job losses or where these cannot be avoided to implement appropriate plans to ameliorate the social and economic impact that downscaling of the operations and/or closure may have on employees, communities and the economy 	Project Manager ECO	Quarterly consultation with communities and other IAPs: R20 000 TOTAL: R20 000	Planning will comply with the requirements of: • The MPRDA and its regulations • NEMA and its Regulations.





3.2.1 Significant activities that require mitigation

The significant impacts identified by the independent specialist consultants who assisted with the compilation of this EMP, are summarised in Table 54. The information presented in this table was summarised from the detailed discussions presented in Section 2.2 above.

3.2.2 Concomitant appropriate technical or management options

The concomitant management options chosen to modify, remedy, control or stop any action, activity or process that may cause significant impacts on the environment, socio-economic conditions and historical and cultural aspects identified, is detailed in Tables 55.1 – 55.10 above. In addition to the management measures presented in the tables, additional specific environmental management procedures were developed for the operations. These are detailed below.

3.2.2.1 Emergency Response Procedure

Emergency environmental incidents can be defined as incidents having the following criteria:

- The likelihood of these incidents occurring is considered to be very low or may never take place during the life of the mining operations.
- The environmental impacts associated with these incidents may be significant if they are not contained or cleaned immediately.

It is essential that personnel involved with mining know how to respond in the event of an environmental emergency situation in order to avoid significant environmental degradation or injury to human health. Ideally such incidents should not occur. If personnel involved in mining implement all management measures outlined in the EMP above, the likelihood of such incidents occurring is greatly reduced. However, despite the best intentions and the best environmental management practices, it is impossible to ensure that no incidents will ever occur during mining. Therefore, it is vital to ensure that all personnel are aware of the management measures to be undertaken in the event of an accident.

Three emergency incidents have been identified. They are hydrocarbon spills, the outbreak of a fire and flooding.

Standard Operating Procedures for these emergency incidents are provided in Tables 56 and 57. The Environmental Incident Report Sheet, which must be completed in the event of an environmental incident/emergency accident, is shown in Table 59. These forms will be managed by the Environmental Officer appointed to the project and will be used to improve environmental management measures to prevent re-occurrence of environmental incidents.

3.2.2.2 On-site Communication Procedure

Copies of the EMP will be kept on site at all times and will be available to the ECO and the Site Manager. The EMP will be provided on request to authorities or stakeholders for inspection.

The mining contractor will implement a checklist that meets the requirements of the EMP, which will be used on a daily basis during inspections. Copies of this checklist must be kept on site by the Site Manager for inspection and auditing purposes. Contractors' meeting minutes must reflect environmental queries, incidents, agreed actions and dates of full compliance with the conditions of the EMP. These minutes will form part of the official environmental record for the project.





3.2.2.3 Site Instruction Entries

A site instruction book must be kept on site by the Site Manager at all times. Entries into the instruction book will be used to record general site instructions relating to mining as well as EMP requirements and/or non-compliances. It will also be used by the ECO for issuing stop orders if unacceptable environmental risks are identified.

3.2.2.3.1 ECO Diary entries

The ECO will keep a diary that will be used to record comments on the mining activities, infringements, possible changes to the EMP that may be required and/or work stop orders.

3.2.2.3.2 Method Statements

Method statements will be required from the mining contractor or any other person working on the site, for specific actions in sensitive areas on request of the authorities or the ECO. The method statement may be modified from time to time, upon agreement between the ECO and the Site Manager. The method statement will describe the scope of the intended activity in a step-by-step description to ensure that the ECO and the Site Manager understand the intentions of the person undertaking the work. As part of this process, the ECO will devise mitigation measures that will minimise environmental impacts associated with the activity. The person undertaking the work will be evaluated against the mitigation measures. For each instance under which the ECO requests a method statement from the person undertaking the work, the document must clearly indicate the following:

- **What** – A concise description of the task/work to be undertaken.
- **How** – A detailed description of the process of work, methods, materials and mitigation strategies.
- **Where** – A description or sketch map indicating the locality of the work or activity, if applicable.
- **When** – An indication of the commencement and completion dates for the planned work.

Upon instruction from the ECO, the person undertaking the work must submit the method statement to the ECO a week before the activity in a sensitive area is due to start. Work may not commence until the method statement has been accepted by the ECO and has been clearly communicated to the workforce. It is the responsibility of the ECO to discuss the need for and the contents of each method statement with the landowner prior to its implementation.

The proposed format of the Environmental Method Statement is provided in Table 60.

3.2.2.3.3 Record keeping

Records related to the implementation of the EMP must be filed by the ECO and Site Manager on site where it can be retrieved easily. All records must be available for scrutiny by any relevant authority or stakeholder.

Photographs must be taken at fixed locations at the mining site, before, during mining and after rehabilitation as a visual reference. These photographs must be filed with the other records related to the EMP on site for inspection at any time.

3.2.2.4 Complaints

In order to set a clear procedure to deal with complaints from landowners and IAPs, a Complaints Register will be kept on site, as detailed in Table 61.





Definition of a complaint:

Complaints may constitute, but are not limited to the following:

- If Sebilo failed to meet the environmental commitments in this EMP.
- If Sebilo failed to meet the conditions of any other written agreements.
- All other issues raised will be treated as grievances, which will be resolved as soon as reasonably possible.

It is preferable that complaints are received in writing (email, fax or letter), but verbal complaints will be accepted under the Complaints Handling Procedure. Written complaints must be directed to the Sebilo Representative, which is:

Name: Tebogo Louw

Address: P O Box 48477, Roosevelt Park, 2129

Email: tebogol@intekom.co.za

Fax: 086 730 7556 / 011 782 3401 **Tel:** 011 782 4322





Table 56 Spill Procedure

PRECAUTION	<ul style="list-style-type: none"> • Clear and secure the area. • Wear the necessary PPE. • All spills should be cleaned up promptly, efficiently and properly. • Immediately warn everyone at risk due to the spill. • Ensure adequate ventilation, if the spill occurred in-doors.
PERSON RESPONSIBLE	The Site Manager is the person responsible to ensure that the spill is managed according to the Spill Procedure. If the Site Manager is not at the scene of the spill, notify him/her immediately to ensure that they attend to the spill as soon as possible.
IDENTIFY THE SPILL	Determine what was spilled. Consult the Material Safety Data Sheets for the item(s) spilled for additional information concerning clean-up requirements. Determine how much of the material was spilled.
EQUIPMENT	<ul style="list-style-type: none"> • PPE: chemically resistant safety gloves, safety glasses, enclosed footwear (safety boots or gumboots) and overall, as applicable and instructed by the Site Manager. • Material Safety Data Sheets for all hazardous material stored on site, including oil, diesel, etc. • Water (to be used sparingly). • Appropriate spill kit.
METHOD	
Non-volatile, non-flammable, non-toxic material	Hazardous materials (flammable, toxic or highly reactive substances)
<ul style="list-style-type: none"> • Put the required PPE on. • Clean the spill up as directed by your Site Manager. • Most clean-ups of non-volatile, non-flammable and non-toxic liquid spills can be done with absorbent material. Clean-up can then be done using a dustpan, brush and appropriate PPE. • Pick up broken glass and dispose of in safe manner. • Wash the area where the spill occurred once the cleanup is completed. Use water sparingly. • Report the spill to the ECO. • Investigate and report the cause of the spill to the Site Manager to prevent future re-occurrence. • Complete an Environmental Incident Report Sheet and submit to the ECO within 24 hours of the spill. 	<ul style="list-style-type: none"> • Put the required PPE on. • Notify the Site Manager and ECO immediately. • Confine spill to a small area with an earth bund wall downstream, or around the spill, if required. • Pick up broken glass and dispose of in a safe manner. • If spilled material is flammable, turn off ignition and heat sources without putting yourself at risk. • Avoid raising dust and inhaling airborne material. • Use the relevant spill kit to clean spill up, eg. oil spill kit. • Contaminated material must be disposed of in an appropriate manner at a waste disposal facility and may not be buried or burned on site. Do not discard of materials or waste water used to clean the spill in sinks, garbage cans or the storm water drains. • Complete an Environmental Incident Report Sheet and submit to the ECO within 24 hours of the spill. • Investigate and report the cause of the spill to prevent future re-occurrence. <p style="text-align: center;">For small spills involving acids:</p> <ul style="list-style-type: none"> • Flush the area with water but not to the extent that the spillage is spread unnecessarily. • Contain the spillage with earth or sand and neutralise carefully with soda ash or sodium bicarbonate. • Dispose of clean-up waste to an industrial waste site. <p style="text-align: center;">For small spills involving alkalis:</p> <ul style="list-style-type: none"> • Contain the spillage with earth or sand. • Use citric acid to neutralise the alkali before clean up. • Residual alkali should be washed with water ensuring that no contact occurs between washings and any aluminium or zinc containers. • Dispose of clean up waste to an industrial waste site.





Table 57 Fire Management Plan

<p>OBJECTIVE To ensure that the Sebilo Perth Mining Project is prepared in the event of a fire breaking out.</p>
<p>FIRE MANAGEMENT ZONES A fire management zone will be created within the mining right area. Before the establishment of mining activities, the following information will be recorded: topography, vegetation, atmospheric conditions, location of firebreaks and access to water bodies.</p>
<p>FIRE PREPAREDNESS To ensure that the mining team is prepared to respond to a fire breakout successfully, the following is applicable: Fire weather and fire danger rating: The dry winter season and drought conditions are rated as fire weather and everyone should be alert to fire hazards during these times. Fast Initial Attack This concept is to quickly suppress any small fire that may start within the mining area.</p>
<p>PREVENTION The following measures will be implemented to prevent a fire outbreak during mining:</p> <ul style="list-style-type: none"> • Clearing vegetation in consultation with the ECO to create a fire management zone. • Collection of firewood will not be allowed. • Open fires will be prohibited to people involved in mining. Only contained fires (eg. konkas) and gas cookers will be allowed on site. • Fires will be allowed in containers (like konkas) during the cold winter months to warm personnel. These fires will be light with care and will be kept contained at all times. • No hunting will be allowed. • No burning cigarettes or matches may be thrown down within the mining area. A bucket with sand will be provided in appropriate areas for the disposal of cigarettes and matches. • No smoking will be allowed near gas, paints or fuel storage areas. • Suitable welding blankets are to be used when welding or operating grinders and this equipment is to be serviced regularly. • A fire extinguisher must be immediately at hand if any 'hot work', like welding or grinding, is undertaken. • Rubbish or vegetation may under no circumstances be burnt. All waste will be removed off site and disposed of at an approved landfill. • Sebilo will implement the necessary liability insurance in case of fire at the operations.
<p>DETECTION The Site Manager will be responsible for a daily inspection of the site and to identify and rectify any fire hazards.</p>
<p>FIRE FIGHTING EQUIPMENT</p> <ul style="list-style-type: none"> • A 10 000 litre water cart will be kept on site for dust suppression. This cart will be made available, should a fire not associated with the mining project break out on surrounding farms. Fire crews from the mining site will also be made available to fight such fires. • On-site vehicles will be used to mobilise fire crews and transport water. • Hand tools to be kept on site for fire fighting include a shovel, an axe, fire swatter, a water hose and a water pump. • PPE will be kept on site and used, including boots with fire resistant soles, gloves, hard hats and a first aid kit.
<p>RESPONSIBILITY It is the responsibility of the Site Manager to ensure that the conditions of the Fire Management Plan are adhered to and that all mining personnel and/or contractors are fully informed and trained to prevent and manage fires.</p>
<p>TRAINING The Site Manager working on the mining site will receive basic fire fighting and first aid training.</p>
<p>REVIEWS The Fire Management Plan will be reviewed annually on the anniversary of the mining license approval date, or if an incident occurs that is not adequately addressed by this Fire Management Plan.</p>





Table 58 Storm evacuation procedure

<p>Objective: To establish safe practices to manage the risk associated with severe storms and protect personnel, equipment, and facilities.</p>
<p>Scope: This procedure should be understood and followed by all employees and contractors.</p>
<p>Responsibilities:</p> <ul style="list-style-type: none"> • Ensure that each manager implements this procedure in their area of responsibility; • Monitor the compliance of this procedure; • Ensure all employees (Contractors) are trained; • Ensure that all personnel on site have proper and working communications equipment, especially those working in remote areas; • Ensure that the shelters close to the available work area have been identified; and • Review Severe Storm procedures with staff at least once a year, and if necessary, update the procedures.
<p>Employees</p> <ul style="list-style-type: none"> • Abide by this procedure.
<p>Safety Department</p> <ul style="list-style-type: none"> • Ensure the implementation of this procedure; • Schedule training sessions on the Severe Storm Procedure for all employees; • Provide guidance on the protection system against severe downpours and lightning, as required; and • The Emergency Response Team (ERT) will be on alert and trained to respond in a timely manner in case of an emergency.
<p>Contractors</p> <ul style="list-style-type: none"> • Provide the necessary resources to carry out this procedure; • Instruct all contracted personnel on this procedure; and • Designate a person responsible for enforcing the procedure in case of a Severe Storm.
<p>Evacuation Drills:</p> <p>Experience has shown that it can take typically 15-60 minutes to evacuate a medium to large sized mine. This time to evacuate will improve (reduce) if evacuation drills are practiced at an operation.</p>
<p>GENERAL PROCEDURES</p> <p>Follow the Alert System (Yellow, Orange and Red) defined below. Each division has designated safe zones and communication methods. Alarm definitions are as follows</p> <p>Yellow Alert indicates that the storm is approximately within a range of 20 to 37 km of the detector (CRITICAL AREA). This alert means we need to be aware on the development of a potential storm. The yellow alert will be communicated every 30 minutes.</p> <p>Orange Alert: Orange Alert indicates that the storm is approximately within a range of 11 to 19 km of the detector (CRITICAL AREA). This means that all personnel must be aware to the alert being communicated by the Risk Prevention Department. The supervisor can and should decide to send their workers to the shelters during the alert particularly in sensitive areas such as outdoor activities. The orange alert will be communicated every 15 minutes.</p> <p>Red Alert: Red Alert indicates that the storm is approximately within range of 0 to 5 km from the detector (CRITICAL AREA). The red alert will be communicated every 5 minutes.</p> <p>DURING A RED ALERT: NO PERSONNEL ARE TO BE EXPOSED! Smoking Areas are off limits If red alert occurs during shift change in any area, proceed immediately to a safe shelter. Departing personnel may move immediately from safe shelter to departing buses.</p>
<p>Training:</p> <p>All staff employees and contractors must be trained on an annual basis and must have a refresher course at least once per month before the beginning of the defined storm season;</p> <p>Site Safety Plan Training will be conducted during new hire orientation and Contractor Hazard Training; and</p> <p>Divisional Specific Training will be included in site specific area training.</p>
<p>Emergency Response:</p> <p>In the event of witnessing an accident, follow these steps: Notify security via radio or phone for EMT response; Provide the location; Indicate the number of potential victims and their current status (if possible); Stay in your location until the arrival of the emergency team; and If safe to do so, take any first aid actions necessary until emergency personnel arrive.</p>
<p>PROCESS DIVISION:</p> <p>All buildings and structures in the process division are bonded to ground. Electronic detection with the three zone color scheme and audible alarms will be used throughout the process areas. Designated Shelters: Crusher buildings;</p>





Screening buildings;
MCC buildings;
Maintenance Shop;
Maintenance Building; and
Offices

Methods of Communication:

Telephone service between all shelter areas;
Radio communication as each operator has personal radio;
Cell phone communication as available;
Audible alarm from detection system; and

All employees working in areas of concern will be issued a hand held detector.

THIS PROCEDURE MUST BE FOLLOWED AT ALL TIMES IN THE PROCESS DIVISION

Process Procedures:

Designated Weather Watcher(s): Control Room Operators

Yellow Alerts will be monitored by control room operators in all process areas.

Orange Alerts:

Orange Alerts will be monitored by control room operators in all process areas. The response to an orange alert will consist of the control room operator making a formal announcement across the radio system to all employees in their respective area.

Red Alerts:

Red Alerts will be monitored by control room operators in all process areas. The response to a red alert will consist of the control room operator making a formal announcement across the radio system to all employees in their respective areas. This announcement must be made three consecutive times and then every 15 minutes thereafter until the red alert is cleared. The announcement must contain these words, RED ALERT ALL EMPLOYEES REPORT TO THE CLOSEST STORM SHELTER IN THEIR AREA.

Employee's working in Areas of concern:

Employees must remain in their vehicles with the doors and windows closed until red alert is cleared. If other emergencies should occur such as a vehicle struck by lightning and fire and you must leave your vehicle then walk approximately 200 m from vehicle and assume a crouch position with feet together and hands covering your ears. Stay in this position until alert has cleared.

Employees can move without delay from shelter to shelter.

Employees in sheltered areas should close large overhead doors and then address work that can be accomplished indoors.

When practical, employees should use red alerts for scheduled breaks and lunch periods.

The stoppage of work for unsafe conditions due to lightning and rain/hail storms can be ordered by any employee.

OPEN PIT DIVISION

Designated Shelters:

Grounded buildings in different areas with doors and windows closed are approved shelters. Approved buildings include the Truck shop, the Welding shop, the Tire shop, the Dewatering shop, Control and the Fuel Bay building. Shipping containers can be used as efficient and economical shelters, either temporarily or permanently.

The insides of vehicles are considered safe shelters, provided all the doors and windows are closed. No one shall leave the vehicle during a Red Alert except to enter a safe structure. No one shall work outside during Red Alert

Communication of Approaching Storm

The Following Open Pit Procedures Must Be Followed.

Designated Weather Watcher(s): Open Pit Supervisor or Operator

The Supervisor will announce the appropriate Alert on mine wide designated radio channels based on the information provided by the detection system.

The Dispatch Supervisor will ensure that the supervisors of the pit, shop, dewatering, and engineering are contacted by radio or phone and understand the alert level

Blasting personnel will monitor a hand held detector unit at the pattern when yellow alert.

During the "Red Alert" the Open Pit supervisors (pit, shop, dewatering, and engineering) will proceed to evacuate and transport all personnel within their departments that do not have access to approved shelters.

All vehicle drivers and equipment operators must remain in their respective units with their windows completely closed until the "Red Alert" has been terminated

All mobile equipment heavy and light must be driven and parked at their designated parking bays outside the open pit. Once the vehicles are parked the operators may withdraw to the designated shelters

With regards to the excavators and less mobile equipment they must be removed from the open pit bottom and parked at an area designated by the Open Pit Supervisors. To ensure there is enough time to carry out this activity it should normally commence during the "Orange Alert period". Once these units are parked up at their designated locations the operators should be uplifted by personnel transport and delivered to the allocated shelters

During the "Red Alert" the vehicle/equipment radio base must only be used if necessary, but the hand held radios can be used at any time.

Normal operations may continue provided that all doors and windows are completely closed.

The indoor activities in workshops and offices may continue their normal activities keeping doors and windows completely closed and remaining within the facilities until the "Red Alert" is terminated.

If your vehicle has been struck by lightning, remain inside until the red alert has been terminated, although, in the event





of an emergency such as fire produced by the discharge, get off the unit and walk away to a distance up to 200m and adopt the crouch position with feet together and ears covered with your hands. If your haul truck is struck by lightning please follow the truck operational procedure.

In the event that there is no place to find shelter, adopt the crouch position with feet together and ears covered with your hands.

During an ongoing blasting process, the blast area must be evacuated and activities must be stopped until the "Red Alert" is terminated. In this case, the blasting evacuation procedure will be applied, which means all personnel shall be evacuated to a safe distance from the blasting area. The pit supervisor will determine the proper evacuation distance.

All rigging activities must be stopped and loads must be grounded.

Personnel can move from the vehicle to a safe structure and from building to building without delay.

The total stoppage of work in the operating area will be a decision of the area supervisor.

Communication to Vendors and Contractors:

The Operations Dispatcher will contact any contractors performing work for operations;

The Drill and Blast supervisor will contact any related contractors;

The Truck shop supervisor will contact any contractors performing work for Maintenance;

The Engineering supervisor will contact any contractors performing work for Engineering; and

The Dewatering supervisor will contact any contractors performing work for Dewatering.

Evacuation Plan during Blasting Procedures:

If a storm approaches while blasting operations are in progress, the following will apply:

Orange Alert:

The blast will be fired, if possible, once the area has been properly secured and all personnel have been evacuated to a minimum distance of 500m.

Red Alert:

All blasting operations will cease, the area will be properly secured by placing roadblocks a minimum of 500m from the blast site. All loose explosives will be locked in the blasting trucks and the trucks will be left at the blast site. Bulk trucks will be left at the blast site. The blasting personnel will be evacuated from the blast site in vehicles that are not carrying explosives.

ADMINISTRATION DIVISION (Exploration, Environmental, Safety & Health, etc.)

Designated Shelters:

Administration Building;

Core Shed;

The insides of vehicles are considered safe shelters, provided all the doors and windows are closed. No one shall leave the vehicle during a Red Alert except to enter a safe structure; and

No one shall work outside during Red Alert

Unsheltered Areas of Concern:

Exploration Drill Rigs;

Stock Piles; and

Any area the stationary audible alarms cannot be heard

Communication of Approaching Storm:

Designated Weather Watcher(s): Process Control Room Operators and Open Pit Dispatch

Process control room operators and open pit dispatch operators will monitor the automated lightning sensing system.

An audible alarm will sound announcing an approaching storm;

All employees working in areas of concern will be issued a hand held lightning detector;

Employee's working in areas of concern must remain in their vehicles with the doors and windows closed until red alert is cleared. If other emergencies should occur such as a vehicle struck by lightning and fire and you must leave your vehicle then walk approximately 200m from vehicle and assume a crouch position with feet together and hands covering your ears. Stay in this position until alert has cleared.

Employees in sheltered areas should close large overhead doors and then address work that can be accomplished indoors; and

Employees can move without delay from shelter to shelter if necessary;

During the "Red Alert" the vehicle/equipment radio base must only be used if necessary, but the portable radios can be used at any time; and

The indoor activities in workshops and offices may continue their normal activities keeping doors and windows completely closed and remaining within the facilities until the "Red Alert" is terminated; and

If your vehicle has been struck by lightning, remain inside until the red alert has been terminated, although, in the event of an emergency such as fire produced by the discharge, get off the unit and walk away to a distance up to 200m and adopt the crouch position with feet together and ears covered with your hands. If your haul truck is struck by lightning please follow the truck operational procedure; and

In the event that there is no place to find shelter, adopt the crouch position with feet together and ears covered with your hands.

Personnel can move from the vehicle to a safe structure and from building to building without delay.

Communication to Vendors and Contractors:

The administrative department responsible for respective contractors and vendors will make contact with them and give instructions on what to do during the alert.





Table 59 Environmental Incident Report Sheet

ENVIRONMENTAL INCIDENT REPORT SHEET

This sheet must be completed in the event of an environmental incident and returned to the ECO. All environmental incidents must be reported immediately to the Site Manager and the ECO.

Mining area: Incident number:

Please tick the relevant box indicating the cause of the environmental incident:

To be filled in by the ECO

Accident Spill Equipment failure Other (please specify below)

Specify other:

In case of spill, please specify type of material spilled (eg. oil)

Location: Date: Time:

Please tick the relevant boxes describing the environment(s) on which the incident will impact upon:

River water	<input type="checkbox"/>	Storm water or rainfall runoff	<input type="checkbox"/>	Dam water	<input type="checkbox"/>	Drinking water	<input type="checkbox"/>
Groundwater	<input type="checkbox"/>	Air quality in nearby community	<input type="checkbox"/>	Air quality in prospecting area	<input type="checkbox"/>	Soil	<input type="checkbox"/>
Plants	<input type="checkbox"/>	Animals	<input type="checkbox"/>	Noise in prospecting area	<input type="checkbox"/>	Noise in nearby community	<input type="checkbox"/>
Private land	<input type="checkbox"/>	Capricorn-owned property	<input type="checkbox"/>	Private property	<input type="checkbox"/>		

Specify other:

Please describe the activity being undertaken at the time of or that caused the environmental incident:

Please indicate what can be done to prevent similar environmental incidents in future:

Person in charge:

Name:

Job title: Contact number:





Table 60 Environmental Method Statement

ENVIRONMENTAL METHOD STATEMENT				
(If the space provided is insufficient, additional sheets can be added)				
WHAT	(Subject of MS)			
WHO	Site Manager			
	ECO			
	Date submitted		Date approved	
WHEN	Date work starts		Date completed	
	Rehabilitation period			
	Restrictions			
	Work Phases	Item	Start date	End date
	Phase 1			
	Phase 2			
	Phase 3			
WHERE	Area of works - submit a sketch plan, if appropriate			
HOW	Route/site pegged			
	Date available for inspection			
	Landscape concerns (refer to EMP, as required)			
	Existing features and services affected (eg. Roads, tracks, kraals, fences, etc)			
	Trees and protected vegetation (protection or removal methods)			
	Reinstatement methods			
	Maintenance required			
	Access and restricted areas			
	General Environmental Considerations (refer to EMP, as required)			
	Machinery, earthworks and dust			
	Stormwater control			
	Stockpiles, refuse and rubble			
Hydrocarbon control measures				
Landowner consultation				
Fire and emergency contingencies				
Special conditions or mitigation measures				
Comments				





Table 61 Complaints Handling Procedure

OBJECTIVE
To ensure that complaints are resolved in an efficient and professional manner.
COMMITMENT
Sebilo is committed to efficient and fair resolution of complaints within the context of this EMP. Sebilo acknowledges landowners' and IAPs' rights to complain and actively solicit feedback in order to ensure that the EMP is effective.
FAIRNESS
Sebilo recognise the need to be fair to both the complainant as well as to Sebilo during complaints handling.
RESOURCES
Sebilo has adequate resources for complaints handling with sufficient levels of delegated authority.
VISIBILITY AND ACCESS
The complaints register will be made available to Government, landowners and IAP on a quarterly basis. The complaints register is accessible to all and ensures that the process of complaints resolution is transparent.
RESPONSIVENESS
Complaints shall be dealt with in a reasonable time and the complainants shall be treated courteously. Feedback will be given to complainants after problem areas have been resolved.
REMEDIES
The Complaints Procedure has the capacity to determine and implement remedies.
COLLECTION
Complaints and outcomes will be recorded in the Complaints Register in the format of a spreadsheet.
SYSTEMATIC AND RECURRING PROBLEMS
Complaints shall be classified and analysed for the purpose of identification and rectification of systematic and recurring problems.
REVIEWS
The Complaints Procedure will be reviewed annually on the anniversary of the mining license approval date or if an incident occurs that is not adequately addressed by this procedure.

3.2.3 Review the significance of the identified impacts

The review of the significance of the identified impacts after implementation of the mitigation measures are presented in Tables 55.1 – 55.10. If the management measures discussed in these tables are implemented, the significance of all impacts identified will be within acceptable standards, as shown in the tables.





4 FINANCIAL PROVISION

In terms of Regulation 52 (2) (d) of the MPRDA, Sebilo is required to -

4.1 Plan for quantum calculation purposes

The location and aerial extent of the mining operations, activities and processes are presented in Figures 40 and 41.

4.2 Alignment of rehabilitation with the closure objectives

Describe and ensure that the rehabilitation plan is compatible with the closure objectives determined in accordance with the baseline study as prescribed.

4.3 Quantum calculations

4.3.1 Historical impacts and liabilities

Assmang extracted low-grade manganese ore from the Perth Manganese Mine up until 1978, using both opencast and underground mining activities. The opencast pit covers an area of approximately 9.6 ha. Underground mining covers an area of approximately 12.2 ha and the workings were accessed from five adits in the highwall of the opencast pit.

Surface infrastructure was demolished during 1992. Assmang embarked on a programme to recover all saleable lump ore from the Perth Project during 2003, as part of a rehabilitation programme. A total of 70 000 t was removed via road to their Gloria Plant for processing (Golder Associates, 2003).

The historical mining footprint includes the following:

- A partially flooded opencast pit and underground workings.
- A waste rock dump that is unrehabilitated and rests at angle of repose, covering an area of approximately 8.3 ha. The dump contains mainly overburden material removed during opencast mining.
- A platform constructed from waste rock, to a height of 2 – 4m, to create a level surface for use as an ore floor.
- Various small piles of manganese ore scattered over the project area.
- Access roads and buildings belonging to Ds Anthonissen, the property owner.

As part of the Assmang rehabilitation programme, it was proposed that the adits in the high wall of the flooded pit be sealed with waste rock, which was tipped over the high water into the pit. Other rehabilitation measures proposed by Golder Associates (2003) include reshaping the waste rock dump slopes to 18°; planting *Acacia mellifera* along the perimeter of the pit as protection; seeding disturbed areas and implementing stormwater management measures. During the walk-over site assessments undertaken as part of this project, there was no evidence of the implementation of these rehabilitation measures.

Golder Associates (2002) embarked on a closure cost estimation for Assmang for Perth Mine. According to their calculations at the time, the quantum for provision for rehabilitation was estimated to be R75 947.50.





This includes dismantling of buildings and steel structures; demolition of reservoirs, silos and other heavy concrete structures and stabilisation of the opencast pit highwall. It was proposed that the adits are sealed with waste rock, as discussed above, as part of the stabilization of the highwall. No provision was made for backfilling of the opencast pit and rehabilitation of the waste rock dump. It is understood that financial provision for rehabilitation was made and that this fund is still owned and managed by Assmang.

According to the MOA between Assmang and Sebilo, the rehabilitation responsibility for the historical mining footprint is transferred to Sebilo. As such, Assmang has transferred the financial provision for rehabilitating the historical mining footprint to Sebilo.

4.3.2 Project components evaluated

4.3.2.1 Mine dewatering

4.3.2.1.1 Pre-mining mine dewatering

The Perth pit water was sampled during October 2010 and March 2011. The results indicate that the quality of the water is very poor, even compared to the Assmang mining and process water quality, (iLEH, 2010). The water exceeds all the DWA Water Quality Guidelines for Domestic Use, with the exception of pH, which is slightly alkaline.

Sebilo used old mine plans and recent survey information to estimate the volume of water present in the opencast pit and the underground workings. The estimated rest level of the pit water is 1035 m above sea level. Based on the pit volume (1.3 million m³) and the void space in the underground workings, the volume of water in the pit is approximately 32000m³ and 82700m³ in the underground workings. The total volume of water present is thus approximately 114 million litres (iLEH, 2010).

4.3.2.1.2 Operational mine dewatering

The proposed Pit Dewatering Strategy is discussed in more detail in Section 2.1.3.1.1 above.

4.3.2.2 Stormwater management and pollution control dams

The proposed stormwater management and pollution control dams are discussed in Section 2.1.3.3.2 above.

4.3.2.3 Haul roads

To construct the haul road, 0.5m of topsoil will be stripped and placed on the soil stockpile. This will be replaced by suitable fill material, like crusher stone, and compacted (Mineral Corporation, 2011).

On either side of the haul road, line drains of up to 0.5m deep will be excavated. These drains will collect stormwater runoff and deliver it to the mine site PCD. The PCD has been designed with sufficient capacity to contain the runoff from the haul road as well as the mine site.

4.3.2.4 Summary of mine components evaluated

The associated mining infrastructure and mining components evaluated as part of this assessment, is summarised in Table 47 (adapted from Mineral Corporation, 2011). The components listed are shown in Figure 40.

Sebilo is in the process of compiling the EMP for the project as part of the mining right





application. The EMP will be completed during the fourth quarter of 2011 and submitted to the DMR for approval. The calculation for financial provision presented in Tables 7 and 8, is therefore provisionally based on available information and was prepared according to the DMR Guideline for Financial Provision (2005).

Two estimates are provided. The first estimate is based on premature closure of the mining project and the second is the expected final planned closure cost for the mining project.

At present, no formal negotiations have been completed with the landowner, Ds Anthonissen, to determine whether he will use mining infrastructure after closure. For the purpose of the calculations, it was assumed that all infrastructure will be removed and rehabilitated. If the landowner would like to use mining infrastructure after closure, the quantum will be adjusted accordingly.

Financial provision for rehabilitation will be made through a bank guarantee. The guarantee will provide for sufficient funds for premature and planned closure of the mining operation.

The quantum for financial provision for rehabilitation and closure will be re-assessed on an annual basis and arrangements to fund shortfalls will be made. This information will be submitted to the DMR on an annual basis, on the anniversary of the mining right approval date.

4.3.3 Baseline information used

The baseline information used during this assessment, as required by the DMR Guideline (DME, 2005) is summarised in Tables 62 and 63. The following is presented in support of the information:

- Primary risk class: The Perth mine will produce less than 10 000 tpm of lumpy manganese ore, which is an oxide basemetal. The operations will include a mine, mine waste, a plant and plant waste. No further processing of the ore will take place and there will be no further risks associated with saleable by-products.
- Environmental sensitivity: the area is largely disturbed by historical mining activities. There is limited natural fauna and flora and exotic plant species were noted. Water resources are probably disturbed and impaired by the historical mining footprint. Local communities are not within sighting distance and the area is rural. The area is not a major source of income to local communities.
- Level of information available: Sebilo is in the process of compiling an EMP for approval, which will include a detailed Closure Plan. The rehabilitation costs are calculated based on the information presented in this report.
- Overburden material will be backfilled into the pit as part of concurrent rehabilitation during mining. No overburden material will remain after closure for rehabilitation.

Table 62 Baseline Information Used

Element	Value
Mineral mined	Iron, iron-bearing minerals, including hematite, goethite, specularite and limonite; and manganese and manganese bearing minerals
Type of mining	Opencast and underground
Geographic location of mine	Kuruman Magisterial district, near Hotazel
Primary risk class	A
Environmental sensitivity	Low
Level of information available	Limited
Nature of terrain/accessibility	Flat
Proximity to urban area where goods and services are supplied	Peri-urban





Table 63 Closure components applicable to the Perth Mine

Component No	Main Description	Applicable Closure Component		
		Opencast	Underground	Combination
1	Dismantling of processing plant and related infrastructure			Yes
2A	Demolition of steel buildings and structures			
2B	Demolition of reinforced concrete buildings and structures			Yes
3	Rehabilitation of access roads			Yes
4A	Demolition and rehabilitation of electrified railway lines			Yes
4B	Demolition and rehabilitation of non-electrified railway lines			
5	Demolition of housing and facilities			Yes
6	Opencast rehabilitation including final voids and ramps	Yes		
7	Sealing of shafts, adits and inclines		Yes	
8A	Rehabilitation of overburden and spoils			
8B	Rehabilitation of processing waste deposits and evaporation ponds (basic, salt-producing waste)			Yes
8C	Rehabilitation of processing waste deposits and evaporation ponds (acidic, metal-rich waste)			
9	Rehabilitation of subsided areas			Yes
10	General surface rehabilitation, including grassing			
11	River diversions			
12	Fencing			Yes
13	Water management (separating clean and dirty water, managing polluted water and managing the impact on groundwater, including treatment, when required)			Yes
14	2 – 3 years of maintenance and aftercare			Yes

4.3.4 Generally accepted closure methods

Based on DMR requirements (DME, 2005), Sebilo undertakes to comply with the following generally accepted closure methods:

- Processing Plant (Component 1): All infrastructure and concrete structures, including foundations, will be broken down to natural ground level and buried adjacent to the plant site. The area will be covered with 1m subsoil and 300mm topsoil to establish vegetation. No credits are allowed for scrap steel and other equipment that can be re-used or sold.
- Reinforced Concrete Structures (Component 2B): All structures will be demolished to 1m below ground level. Rubble will be buried adjacent to the site. The silo will be imploded and buried. The affected areas will be shaped, covered with 300mm topsoil and vegetated.
- Railways (Component 4A): Rehabilitation will include removal of the ballast, sleepers and rail. All culverts, bridges and structures are to remain. No rehabilitation will be undertaken to the general earthworks, neither cut or fill. The electrification of the railway line will be removed, including the sub-station and signalling. The area will be cleaned up in general and adequate drainage will be implemented. No credits are allowed for second-hand rail and ballast sales.
- Opencast rehabilitation (Component 6): The most beneficial land-use after closure will be identified in consultation with the landowner. Sebilo intends to backfill the pit with waste rock material. Concurrent rehabilitation will commence within 3 years after opencast mining commences. In order to achieve this, overburden material will be deposited in close proximity to the pit. Whether or not a final void will remain after mining, will be determined as part of the compilation of the EMP for the project.
- Sealing of decline shaft (Component 7): Inert concrete rubble from the demolition of surface infrastructure will be deposited into the decline shaft. A mass concrete cap of 1000mm thickness will be placed onto the building rubble into the shaft. The shaft area will be shaped and covered with 300mm of topsoil for grassing.
- Processing plant waste: basic and salt-producing (Component 8B): The new waste rock dump to be constructed by Sebilo will be backfilled into the pit as part of the concurrent





rehabilitation programme. Excess overburden material will be shaped and grassed. The tailings facility will also be shaped and grassed. Slopes will be modified to gradients of 1:3. The necessity of a dedicated cover on the excess waste rock or on the tailings facility, will be determined as part of the EMP for the project.

- Pollution control dams: The operational PCDs will be lined to prevent seepage of contaminated water to the soil and groundwater.
- Water management: Stormwater will be managed with concrete chutes at 200m spacing on the upper and outer slopes of the rehabilitated waste rock and tailings facilities. Energy dissipation will be included in the design to minimise erosion from surface runoff. The runoff will be diverted to the PCDs during the operational phase of mining.
- Surface and groundwater impact management: the operational cutoff trenches and berms will be kept in place until all rehabilitation has been completed and monitoring indicates runoff from the area is clean. At this point, the cutoff trenches and berms will be removed and rehabilitated.
- General surface rehabilitation: Final surface rehabilitation will be aligned with the selected final land use. The surface topography will emulate the surrounding general landscape. Steep slopes, in excess of 6%, will be avoided. The landscaping will facilitate surface runoff and free draining areas. All infrastructure will be removed and the area will be made neat and suitable for revegetation.
- Maintenance and aftercare: This is planned for 2 – 3 years after mining production ceases. It will include annual fertilising of rehabilitated areas, monitoring of surface and groundwater impacts, the control of alien invasive plants and general maintenance.

4.3.5 Preliminary closure objectives

The following preliminary closure objectives are provided as a basis for the calculation of the quantum for rehabilitation and closure. These closure objectives will be confirmed and/or expanded, as necessary, as part of the compilation of the EMP for the project.

- To ensure plans are in place for the continued management of the site in accordance with the Closure Plan.
- To create safe and stable landforms conducive to revegetation.
- To rehabilitate the site to a self-sustaining ecosystem such that the site blends in with the surrounding landscape as far as this is practical.
- To consult the landowner, community and IAPs as part of developing the Closure Plan, focussing specifically on the final land use.
- To monitor environmental performance during operation, decommissioning and post-closure stages of the project and to take appropriate action until the specified closure criteria have been met. A maintenance and aftercare period of 3 years was included in this assessment.
- There will be no adverse environmental effect outside the disturbed area and the affected area will be shaped to ensure effective drainage and prevent ponding on site.
- The disturbed area will not require greater maintenance than that in or on surrounding land after closure.





4.3.6 Closure liability calculations

Based on the discussions and information presented above, the premature closure liability for the proposed Perth Mine is estimated in Table 64 and the final closure liability in Table 65.

Based on the information presented in this report, and the quantities listed in Table 47, the premature closure liability is R10.7 million and the final closure liability for the operations is estimated to be R12.6 million (excluding VAT).

The two amounts are similar due to the fact that most of the infrastructure and mining components will be required from the start of the project. The final pit extent may be smaller at premature closure, compared to final closure. The fencing and access roads are also expected to be less at premature closure.

The numbers presented in Tables 64 and 65 will be confirmed as part of the process of compiling the EMP for the operations.

As discussed above, the quantum for rehabilitation will upon approval of the mining right, be amended on an annual basis and the financial provision will be adjusted accordingly.





Table 64 Premature Closure Liability Estimation

Premature Closure and Rehabilitation Costs

Mine:
Evaluators:
Risk Class
Area Sensitivity

Perth Mine
Irene Lea
A
Low

Location:
Date:

Kuruman
30-Jul-11

No.	Description	Unit	A	B	C	D	E=A*B*C*D
			Quantity	Master rate	Multiplication factor	Weighting factor 1	Amount (rands)
1	Dismantling of processing plant and related structures (including overland conveyors and powerlines)	m3	10,000	6.82	1.00	1.00	68,200
2(A)	Demolition of steel buildings and structures	m2	0	95.00	1.00	1.00	0
2(B)	Demolition of reinforced concrete buildings and structures (silo)	m2	100	140.00	1.00	1.00	14,000
3	Rehabilitation of access roads	m2	78,000	17.00	1.00	1.00	1,326,000
4(A)	Demolition and rehabilitation of electrified railway lines	m	3,150	165.00	1.00	1.00	519,750
4(B)	Demolition and rehabilitation of non-electrified railway lines	m	0	90.00	1.00	1.00	0
5	Demolition of housing and/or administration facilities	m2	0	190.00	1.00	1.00	0
6	Opencast rehabilitation including final voids and ramps	ha	8	99,600.00	1.00	1.00	796,800
7	Sealing of shafts, adits and inclines	m3	3,000	51.00	1.00	1.00	153,000
8(A)	Rehabilitation of overburden and spoils	ha	0	66,400.00	1.00	1.00	0
8(B)	Rehabilitation of processing waste deposits and evaporation ponds (basic salt-producing waste)	ha	11	82,700.00	1.00	1.00	879,928
8(C)	Rehabilitation of processing waste deposits and evaporation ponds (acidic, metal-rich waste)	ha	0	240,200.00	1.00	1.00	0
9	Rehabilitation of subsided areas	ha	0	55,600.00	1.00	1.00	0
10	General surface rehabilitation	ha	81	52,600.00	1.00	1.00	4,260,600
11	River diversions	ha	0	52,600.00	1.00	1.00	0
12	Fencing	m	400	60.00	1.00	1.00	24,000
13	Water management	ha	14	20,000.00	0.60	1.00	163,080
14	2 to 3 years of maintenance and aftercare	ha	81	7,000.00	1.00	1.00	567,000
15A	Specialist study	Sum	0	0.00	1.00	1.00	
15B	Specialist studies (soil remediation)	ha	0	0.00	1.00	1.00	0.00
SubTotal 1							8,772,358

10000

(Sum of items 1 to 15 above)

1	Preliminary and General	6.0% if Subtotal 1 > 100 000 000 12.0% if Subtotal 1 < 100 000 000	Weighting factor 2	1.05 0.00	1,105,317
7	Contingency	10.0% of Subtotal 1			877,236

SubTotal 2 10,754,911

(Subtotal 1 plus sum of management and contingency)

Add Vat (14%) 1,505,688

GRAND TOTAL 12,260,598
(Subtotal 2 plus VAT)





Table 65 Final Closure Liability Estimation

Final Closure and Rehabilitation Costs

Mine:
Evaluators:
Risk Class
Area Sensitivity

Perth Mine
Irene Lea
A
Low

Location:
Date:

Kuruman
30-Jul-11

No.	Description	Unit	A	B	C	D	E=A*B*C*D
			Quantity	Master rate	Multiplication factor	Weighting factor 1	Amount (rands)
1	Dismantling of processing plant and related structures (including overland conveyors and powerlines)	m3	10,000	6.82	1.00	1.00	68,200
2(A)	Demolition of steel buildings and structures	m2	0	95.00	1.00	1.00	0
2(B)	Demolition of reinforced concrete buildings and structures (silos)	m2	100	140.00	1.00	1.00	14,000
3	Rehabilitation of access roads	m2	78,000	17.00	1.00	1.00	1,326,000
4(A)	Demolition and rehabilitation of electrified railway lines	m	3,150	165.00	1.00	1.00	519,750
4(B)	Demolition and rehabilitation of non-electrified railway lines	m	0	90.00	1.00	1.00	0
5	Demolition of housing and/or administration facilities	m2	0	190.00	1.00	1.00	0
6	Opencast rehabilitation including final voids and ramps	ha	10	99,600.00	1.00	1.00	996,000
7	Sealing of shafts, adits and inclines	m3	9,000	51.00	1.00	1.00	459,000
8(A)	Rehabilitation of overburden and spoils	ha	0	66,400.00	1.00	1.00	0
8(B)	Rehabilitation of processing waste deposits and evaporation ponds (basic salt-producing waste)	ha	13	82,700.00	1.00	1.00	1,066,000
8(C)	Rehabilitation of processing waste deposits and evaporation ponds (acidic, metal-rich waste)	ha	0	240,200.00	1.00	1.00	0
9	Rehabilitation of subsided areas	ha	0	55,600.00	1.00	1.00	0
10	General surface rehabilitation	ha	95	52,600.00	1.00	1.00	4,991,740
11	River diversions	ha	0	52,600.00	1.00	1.00	0
12	Fencing	m	800	60.00	1.00	1.00	48,000
13	Water management	ha	14	20,000.00	0.60	1.00	163,080
14	2 to 3 years of maintenance and aftercare	ha	95	7,000.00	1.00	1.00	665,000
15A	Specialist study	Sum	0	0.00	1.00	1.00	
15B	Specialist studies (soil remediation)	ha	0	0.00	1.00	1.00	0.00
SubTotal 1							10,316,773

10000

(Sum of items 1 to 15 above)

1	Preliminary and General	6.0% if Subtotal 1 > 100 000 000	Weighting factor 2	1.05	
		12.0% if Subtotal 1 < 100 000 000		0.00	1,299,913
7	Contingency	10.0% of Subtotal 1			1,031,677

SubTotal 2 12,648,364

(Subtotal 1 plus sum of management and contingency)

Add Vat (14%) 1,770,771

GRAND TOTAL 14,419,135

(Subtotal 2 plus VAT)

4.4 Undertaking to provide financial provision

Sebilo herewith undertakes to provide the amount required for rehabilitation as a bank guarantee, should the right be granted.

The quantum for rehabilitation will be re-assessed on an annual basis and updated information will be presented to the DMR upon completion of the annual assessment.





5 MONITORING AND PERFORMANCE ASSESSMENT

Undertaken in terms of Regulation 52(2)(e) of the MPRDA.

5.1 List of impacts requiring monitoring programmes

The following impacts will require monitoring during the construction, operational and closure phases of the proposed mining operations:

- Air quality
- Cultural heritage
- Fauna and Flora
- Groundwater
- Soil
- Surface water
- Erosion
- Mine residue deposits
- Socio-economics

5.2 Functional requirements for monitoring programmes

The functional requirements for the monitoring programme are presented in Table 66.

5.3 Roles and responsibilities for monitoring programmes

The monitoring responsibility is assigned to the ECO, the Project Manager as well as to specialist consultants and the Plant Manager in Table 66.

5.4 Committed time frames for monitoring and reporting

The committed time frames for the monitoring programme are presented in Table 66.

The EMP will be audited by an independent party on a bi-annual basis to determine the level of compliance, according to the requirements of Regulation 55 of the MPRDA. The results of this audit will be used to improve environmental management procedures, where required.

The Performance Assessment Audit Report will be submitted to the DMR upon completion.





Table 66 Proposed Monitoring Programme

Monitoring Aspect	Monitoring Position	Parameters to monitor	Responsibility	Monitoring frequency and reporting	Performance Indicator
Air quality	5 Dust buckets down wind of mining area	• Dust fall-out	ECO	Quarterly monitoring	• Fall-out dust <300 mg/m ³ /day
Cultural heritage	Graveyard	• Grave sites	Maintenance Department	Quarterly	• No deterioration or unauthorised access
Fauna and Flora	Mining areas	• Species composition, condition and abundance	Specialist ecologist	Bi-annual before and after rainy season	• Conditions comparable to surrounding land
Fauna and Flora	Mining area	• Alien invasive and pest species	ECO	Bi-annual before and after rainy season	• No alien invasive species or pests present
Groundwater	5 existing mine boreholes 18 private boreholes	• Quality, groundwater level	ECO	Quarterly: mine boreholes Bi-annually: private boreholes	• Quality in mine and private monitoring boreholes to be equal or better than SANS Class 1 Standards.
Soil	Mining area	• Chemistry • Physical properties	Specialist soil scientist	Annually	• No deterioration from ambient conditions
Surface water	Up- and downstream when the Wittiege stream flows	• Quality and stream sediment quality	ECO	Bi-annually, when carrying water	• Quality at upstream and downstream compliance points to be equal or better than In-stream Water Quality Objectives
Erosion	Mining area and rehabilitated ground	• Signs of erosion	ECO	Monthly	• No visible signs of erosion. Stormwater management measures are in place.
Mine residue deposits	Side walls Waste material Toe paddocks Return water dam	• Physical and chemical stability. • Chemical composition and mineralogy. • Leachable harmful substances and contamination potential	Plant Manager ECO	Per the requirements of the COP for Mine Residue Deposits	• Slope stability of permanent retention barriers and embankments. • Safety index for specific use in embankment stability. • Capacity of drainage systems. • Peak flood capacity of dams and embankments, drainage channels, settling ponds.
Socio-economics	Labour sending areas Local communities	• Individual and community welfare. • Economic indicators: employment rates	Project Manager	Annually	• Requirements of SLP • Economic stability





6 CLOSURE AND ENVIRONMENTAL OBJECTIVES

Undertaken in terms of Regulation 52 (2) (f) of the MPRDA.

6.1 Rehabilitation plan

6.1.1 Rehabilitation objectives

- Existing watercourses such as riparian zones, are taken into consideration during rehabilitation.
- The newly created topography should contribute to and blend in with the natural surrounding environment to ensure self-sustaining, stable systems with alternative utilisation potential.
- Rehabilitation designs are developed so that the least possible amount of material has to be shifted so as not to affect the structure of topsoil and overburden material to be used.
- Concurrent rehabilitation will be undertaken of the opencast pits during the current phase of mining. This will be achieved by the roll-over method of rehabilitation during which mined-out blocks are progressively backfilled with overburden material, shaped and topsoiled.
- Careful selection of indigenous plant species, adapted to the climatic conditions, will be used to ensure a low cost, low maintenance and speedy recovery of disturbed areas. Where possible, self-seeding will be encouraged from the natural seedbed in the topsoil.
- Soil amelioration will only be undertaken to the extent that would bring disturbed soils into equilibrium with the natural environment and not to reach agricultural levels.
- Available material will be used as a cover layer, even if amelioration is required, to avoid further destruction of land by creating borrow pits.
- Contour walls must be constructed to prevent erosion on the slopes of waste rock dumps. As a general guideline, contour walls will be constructed every 20 – 30m, depending on the gradient and the length of the slope and the coarseness of the surface material.
- Waste rock dumps and ultrafine material will be backfilled into the mined out pit.
- The mining area will be divided into rehabilitation units as part of the development of the Final Closure Plan. A detailed rehabilitation plan will be developed for each unit, including a terrain analysis, soil and vegetation survey and designs of earthworks and cross sections through each area. A summary of the volumes of material to be shifted at each unit will be provided. A general plan of the area will be prepared at an appropriate scale and indicating the surface topography to accurate interval spacings.

6.1.2 General rehabilitation objectives

The general approach to rehabilitation is detailed in Table 67. The principles presented will form the basis of the Final Closure Plan for the operations and will be expanded and finalised during the decommissioning phase of mining.





Table 67 General rehabilitation principles

Discussions will be undertaken with the landowner during the decommissioning phase of mining to identify infrastructure and buildings that they can use after mine closure. Such areas will be removed from the Final Rehabilitation Plan, including the Financial Provision for Rehabilitation. Sebilo will submit a letter to the DMR listing the infrastructure and buildings on property it owns that will not be rehabilitated, but will be used after mining ceases.
Progressive rehabilitation will be undertaken during the operational phase of mining. The roll-over method of rehabilitation will be implemented at the opencast operations during which mined-out areas will be backfilled, shaped and covered with topsoil on an on-going basis.
At closure, the decline shafts will be backfilled and sealed according to DMR requirements, in consultation with the Chief Inspector of Mines. The area will be shaped to ensure free draining conditions and to avoid ponding. The disturbed area will be topsoiled and vegetated to blend into the surrounding environment. The rehabilitated shafts will be marked on surface with appropriate signage for future location, as required.
At closure, all temporary and permanent equipment and facilities, not required by the landowners, will be removed off site.
All sumps and trenches will be backfilled, compacted and topsoil will be replaced.
Topsoil will be replaced across the disturbed areas and shaped to allow a free draining surface. No ponding on the disturbed area will be allowed, unless agreed to with the landowner. Ponding in two of the pits rehabilitated during the 1990s are used for stock watering during the rainy season. Analysis of the water indicates that it is of good quality.
A survey will be undertaken of all disturbed areas to record the occurrence of alien invasive species. These plants will be removed according to the Alien Invasive Eradication Programme in this EMP.
Waste containers will be removed off site and waste will be disposed of at an approved landfill site.
All survey pegs and flagging will be removed, where required.
Natural re-vegetation from the seed mix contained in topsoil will be encouraged at the operations. Current progressive rehabilitation undertaken as part of the operational phase of mining indicates that this is feasible. Rehabilitated areas will be inspected regularly. Where bare ground occurs, ripping, fertilisation and seeding with a vegetation seed mix adapted to reflect the local indigenous flora, will be considered. An inspection will be held after rehabilitation to determine weed or pest infestation and the necessary corrective action will be implemented.
Access roads, not required by landowners, will be ripped and graded to match the surrounding landforms. If necessary, rehabilitated roads will be appropriately fertilised, based on a soil analysis, to ensure the regrowth of vegetation. Imported road construction materials may hamper the regrowth of vegetation will be avoided as far as possible. If material has to be imported, it will be removed and disposed of to an approved landfill during rehabilitation.
Damage to pre-existing roads will be repaired in consultation with the landowner. If backfilling is required, inert material will be used.
The affected area will be shaped to ensure effective drainage of stormwater and to prevent ponding on site.
In cases where native vegetation has been removed or damaged and where re-vegetation is required, species endemic to the area will be re-established, as required.
At closure, the Regulation 2(2) Plan will be updated to reflect the final extent of mining and will be submitted to the DMR. A final Environmental Risk Report (ERR) will be compiled according to Regulation 60 of the MPRDA and included in the Final Closure Plan that will be developed at the start of the closure phase. The ERR will be based on the screening level environmental assessment presented in this document as well as additional sampling, data collection and monitoring that may be required.
Photos will be taken of each site before, during and after mining at a fixed point and filed for inspections.

6.2 Closure objectives

6.2.1 Conceptual Closure Plan

The purpose of this Conceptual Closure Plan is to describe the general objectives for the post-mining land use at the Sebilo Perth operations and the planning processes leading to the final Closure Plan. The Conceptual Closure Plan will be updated on an annual basis and will be submitted to the Authorities with the revised quantum for rehabilitation, as required by the MPRDA. The planning presented here aims to adhere with the following general principles of mine closure:

- Environmental Management Plans must comply with best practise.
- The closure planning and management actions must comply with the applicable legislation.
- A Final Closure Plan with the sufficient level of detail must be prepared at least 5 years before planned closure. This should include specialist studies evaluating the long-term impact of mining on the environment, as required.
- Risk assessments to be based on conservative assumptions in the absence of reliable data.





6.2.2 Proposed closure objectives

The following closure objectives will be applicable for rehabilitation:

- To ensure plans are in place for the continued management of the site in accordance with the Closure Plan.
- To create safe and stable landforms conducive to revegetation.
- To rehabilitate the site to a self-sustaining ecosystem such that the site blends in with the surrounding landscape as far as this is practical.
- To consult local communities and IAPs regarding the closure of the Perth operations.
- To retain features of heritage value where practical, consistent with the mining history of the area.
- To monitor environmental performance during operation, decommissioning and post-closure stages of the project and to take appropriate action until the specified closure criteria have been met.
- Land disturbed will be rehabilitated to a stable and permanent form suitable for subsequent land use.
- The final land use will be cattle farming.
- There will be no adverse environmental effect outside the disturbed area and the affected area will be shaped to ensure effective drainage and prevent ponding on site.
- The disturbed area will not require greater maintenance than that in or on surrounding land after closure.

The proposed closure objectives and completion criteria are listed in Table 68.





Table 68 Closure objectives and completion criteria

Closure Area and Component	Closure Objective	Completion Criteria
General		
All areas	The landowners are left with no residual liability for site rehabilitation and/or maintenance.	Government approval of Final Closure Report, which demonstrates achievement of all completion criteria.
	Public health and safety is not endangered.	An independent audit confirming that any remaining mining infrastructure left is safe and secure and discourages public access.
	Final land use characterised by vegetation that is resilient, self-sustaining and comparable to the surrounding areas.	A landscape and vegetation assessment is undertaken, which confirms that rehabilitation is resilient, self-sustaining and comparable to surrounding areas.
	No increase in contaminant levels above baseline conditions.	A site contamination survey that demonstrates no elevated levels of indicator contaminants.
	Full awareness with landowner and other IAPs regarding the mine closure concept and timing thereof.	Stakeholder engagement records show ongoing consultation and engagement in closure planning process.
Site infrastructure		
Processing plant	All infrastructure is removed.	Audit of closure area against Final Closure Plan to confirm no plant infrastructure remain on site.
Mine residue facilities	Rehabilitated in situ tailings that will not be reprocessed and does not pose a threat to the environment or human health	Audit of closure area against Final Closure Plan to confirm the mine residue deposits are appropriately rehabilitated and not a threat to the environment or human health.
Opencast workshop and stores	All infrastructure is removed.	Audit of closure area against Final Closure Plan to confirm no workshop and stores infrastructure remain on site.
Mining operations		
Opencast pits	Quality of water that collects from rehabilitated areas does not lower surrounding water quality or impact on fauna that may use it, e.g. cattle, game, birds and amphibians No impact on water quantity or quality available to private groundwater users. No private groundwater users have been identified at present. This will be confirmed at closure. No injuries or deaths resulting from pit stability or ease of access to the pits.	Monitoring post-closure of surface water runoff from areas in rehabilitated areas show compliance with in-stream water quality objectives for the catchment and trends from operational monitoring does not show a deteriorating trend. Groundwater monitoring post-closure in mine and private boreholes identified, demonstrates there is no change from the baseline in terms of quality and quantity and a specialist groundwater study shows that recharge rates are as per the predictions undertaken during the operational phase. Backfilling, shaping and re-vegetation of the pit. Audit of closure area against Final Closure Plan to confirm the gradient of slopes and quality of rehabilitation.
Surface water dams		
Surface water management structures	Surface water storage areas and reservoirs are removed and/or rehabilitated to provide habitat for fauna, with no alien invasive species present. All surface water structures remaining in place are physically stable and safe to cattle, game and humans	Fauna and flora assessment undertaken and report to indicate that surface water functions as habitat for fauna and that no alien invasive species are present. Audit of structures against Final Closure Plan to confirm acceptable stability and safety.
Access and haul roads		
Access roads	All access roads are to be rehabilitated unless required for end land use by landowners. All haul roads and other site roads to be rehabilitated unless required for end land use by landowners.	Audit of access roads and associated infrastructure no longer required after closure confirm decommissioning and rehabilitation to acceptable standards. Audit of haul and site roads and associated infrastructure no longer required after closure confirm decommissioning and rehabilitation to acceptable standards.





6.2.3 Closure planning

Sebilo recognises the fact that the process of mine closure is a cyclical process that needs continual assessment and updating as the operations move from operational phase through to the final mine closure and post closure phases. This process takes account of improvements in technology, ore reserve re-assessments, updated results from ongoing field closure trials, legal updates, changes in stakeholder expectations and so forth.

Sebilo incorporates closure planning into the operation of their mining area. Closure planning is vital to ensure that closure costs are estimated for the operation and that the quantum for rehabilitation is updated annually as part of the budgeting process. The closure plan and cost estimates are based on the most probably scenario for rehabilitation and closure of the operations.

Regular internal reviews of the closure plan enables Sebilo to ensure plans and cost estimates are accurate as the operation progresses and changes. The reviews also enable:

- More extensive research and engineering to improve original closure assumptions.
- More detailed engineering designs and cost estimates for closure near the end of the life of mine.
- For adjustments to accommodate changes in society expectations and legal requirements at the time of closure.

6.2.3.1 Operational Phase of Mining

The following activities will be undertaken in preparation for mine closure during the operational phase of mining:

- Develop a progressive rehabilitation plan
- Identify research and development needs for closure
- Implementation an ongoing review of operational plan
- Undertake EMP performance assessment and amendment of EMP as required
- Progressive implementation of rehabilitation and Final Closure Plan
- Implementation of monitoring programmes to verify long-term impacts
- Implementation of research and development programmes
- On-going Environmental Risk Assessment (ERA) and review of closure impacts
- Continuous review of closure plan and closure cost assessment in conjunction with budget review
- Develop a quantitative ERA 5 years prior to closure.
- Ongoing review of post-closure impacts
- On-going consultation with IAPs on post-closure objectives.

6.2.3.2 Final Mine Closure Plan

The Final Closure Plan will be compiled 5 years before planned closure. This process will include a detailed site risk assessment. Sebilo will engage in stakeholder consultation to develop and agree on final closure objectives.





6.2.4 Management of the socio-economic impact of mine closure

The Final Closure Plan will include comprehensive plans, with a variety of strategies, to manage the socio-economic impact of retrenchments and mine closure according to the requirements of the SLP. These strategies will be guided by the following principles:

- Consultation with local communities, Government departments and other relevant parties. Local businesses that are reliant on the mine will also be consulted as part of this process.
- Capacity building focussed at empowering retrenched employees to set up their own businesses. Support and guidance will be provided during operations as well as at the time of retrenchment to encourage entrepreneurial initiatives through local business and with interested employees.
- Mentorship will be used during the operational phase in line with the needs of employees, empowered groups and local community structures. Ad hoc mentoring for entrepreneurs will be provided as required and based on specific projects.
- Skills development will be conducted with employees facing retrenchment, in addition to the skills development initiatives that takes place during the life of mine. This programme will be focussed on developing skills that can be transferred to other industries and which will promote employability. The skills development programme will build on skills that are recognised nationally as well as on the existing skills of employees. Skills gaps will be addressed to enable employees to manage their own careers and to provide business related training, where applicable.

6.2.4.1 Decommissioning Phase

A Final Closure Plan will be developed, based on all the information gathered during the operational and decommissioning phases of mining and will be submitted to the authorities at the end of the decommissioning phase for approval. The Final Closure Plan will document clearly all the work undertaken in the mine closure risk assessment process as well as the decisions and agreements reached with IAPs. The agreed quantitative closure objectives and performance indicators for all significant risks identified will be listed, together with the monitoring programme that will be implemented to verify compliance with the objectives. At this stage, the closure cost assessment and financial provision assessment will be included.

The Final Closure Plan will address the residual or latent impacts, post-closure monitoring and maintenance procedures, financial arrangements for post-closure management and maintenance and contractual agreements with future landowners and/or responsible parties.

Following rehabilitation of the mining area there will be a requirement for maintenance, particularly during the initial two years following closure. Maintenance of the site will continue until all closure completion criteria have been met (see Table 68). These activities are likely to involve repair to surface drainage structures, repair of any erosion areas or the reseeded areas due to poor vegetation establishment. More specifically, where monitoring has identified erosion, weed invasion, failure of revegetation or excessive browser damage to regenerating vegetation, maintenance activities will be implemented to ensure regeneration progresses successfully and rapidly. Restriction of access of cattle to rehabilitated area until vegetation is established.

The specific objectives in managing the decommissioning process will be:

- To obtain approval of the Final Closure Plan.
- To ensure that rehabilitation and decommissioning are carried out in a planned sequential manner, consistent with best practice.
- To ensure that the agreed post-mining land-use outcomes are achieved.





- To finalise financial arrangements, contractual agreements with landowners and other responsible parties and to avoid ongoing liability.

Decommissioning will address the following aspects of the Closure Plan:

- Scheduling for the removal of the plant, infrastructure and other materials.
- Retention of specific infrastructure as required by the landowner, where applicable.
- Site access and fencing post-closure.
- Environmental monitoring, including groundwater, fauna, vegetation, soil profile reconstruction, erosion as part of the verification programme
- Removal of contaminated material, if required.
- Maintenance and care programme until final closure is achieved.
- Regular reporting to the Authorities.
- Site closure and signoff.

6.2.5 Post-closure Phase

A final Closure Risk Assessment Report will be prepared by Sebilo upon mine closure.

If a closure certificate is issued, Sebilo will no longer have a formal responsibility and the appointed third party will be responsible for the implementation of the post-closure monitoring and maintenance programmes. These programmes will be developed as part of the Final Closure Plan.

This phase will continue until the residual impact of the operations has reached acceptable levels and no further ongoing maintenance work is required.

6.2.6 Final land use

The revegetation objective will be to re-instate natural vegetation complexes across disturbed areas, to a grazing potential comparable to natural veld. Self-sustaining complexes that maintain representative species composition and structure, based on existing vegetation types, will be encouraged. Alien invasive species will be eradicated and follow-up programmes will be implemented to ensure that regrowth does not take place.

The proposed land use at mine closure is detailed in Table 69.





Table 69 Proposed land uses for each Closure Area after Closure

Closure Area	Component	Proposed Land Use
Site infrastructure	Processing plant	Resilient, self-sustaining indigenous vegetation providing suitable area for grazing as well as a habitat for fauna.
	Opencast workshops and stores area	Resilient, self-sustaining indigenous vegetation providing suitable area for grazing as well as a habitat for fauna.
Mine workings	Opencast pits	Pits: stabilised modified landform suitable, sustainable and safe for grazing. Overburden bunding: resilient, self-sustaining indigenous vegetation of local origin and suitable for grazing.
	Waste rock dumps	It is the intention of Sebilo to backfill all waste rock back into the pit. If for some unforeseen reason, waste rock will remain after closure, the final land use will be stabilised modified landform with resilient, self-sustaining indigenous vegetation of local origin.
	Ultrafines compoundment.	It is the intention of Sebilo to backfill all fines back into the pit. If for some unforeseen reason, ultrafine material will remain after closure, the final land use will be stabilised modified landform with resilient, self-sustaining indigenous vegetation of local origin.
Access and haul roads	Access and haul roads	Some access roads may be left for use by landowners or other road users. Access roads not required by current users will be returned to resilient, self-sustaining vegetation of local origin, suitable for grazing.
Mine water dams	Surface water management structures	Stabilised modified landform with resilient, self-sustaining indigenous vegetation of local origin

6.2.7 Care and Maintenance

In the event that a care and maintenance phase is required, stores of potentially hazardous materials, like fuels and oils, would be reduced to minimum levels or removed from the site entirely. Monitoring required under the EMP will be continued until no longer required.

Access to the mining area will be strictly controlled during care and maintenance. Security measures would be put in place to limit public access.

6.3 Confirmation of consultation

Sebilo confirms that the environmental and closure objectives will be discussed with the landowner during a meeting scheduled for 17 Mei 2012. These objectives were discussed with other IAP during the Open Day held on 21 April 2012. The landowner could not attend the Open Day due to personal reasons.





7 PUBLIC PARTICIPATION

Undertaken in terms of Regulation 52 (2) (f) of the MPRDA.

The following objectives are set for the Public Participation Process for the project:

- Undertake reasonable measures to identify landowners and IAP, provide information on the project in writing and afford them an opportunity to express their views/concerns about the project.
- Inform Government Authorities of the project and provide an opportunity for them to express their concerns and indicate which issues they would like to see addressed in the EMP.
- Record IAP raised issues associated with the project, which are likely to impact on the biophysical and socio-economic aspects of the surrounding environment.
- Assist in defining the terms of reference for the EMP for the project.
- Determine and document which aspects of the project require further investigation during the proceeding phases.
- Document the process and outcomes of the Public Participation Process.

7.1 Identification of Interested and Affected Parties

Landowners and their contact details were identified through a Title Deed search for the properties around the proposed project area. The information obtained was incorporated into the IAP Database, which is presented in the Scoping Report for the project (iLEH, 2011).

Other key IAPs were identified through Sebilo's interaction with the Tribal Authority, local and provincial Government, surrounding mining operations, organised labour, the farming community and Non-Governmental Organisations (NGO). These key stakeholders are included in the IAP Database.

Letters, Background Information Documents (BID) and Project Comment Sheets were hand delivered or posted with registered mail to landowners and surrounding Mining Houses for who contact details were available at the time of the compilation of this report. This documentation was used to introduce these IAP to the project and to invite them to participate in the process. IAP were also identified through responses to advertisements placed, telephone discussions, e-mail and faxed communication as well as a public meeting, as detailed below.

A public Open Day was held on 21 April 2012. A total of 81 community members attended this meeting. The attendance register for the Open Day is contained in Appendix 11.

7.1.1 Landowner and lawful occupier

The Title Deed landowner is Ds EZ Anthonissen and the land is currently leased to Mr FH Swanepoel (Table 70).

Table 70 Landowner contact details

	Name	Tel No	Fax No	Address	Email
Land owner	EZ Anthonissen	083 306 6021	053 741 1382	P O Box 117 Hotazel 8490	ebena@absamail.co.za
Land leased to	FH Swanepoel	083 395 6364	053 712 3000	P O Box 2741 Kuruman 8460	fhs@isat.co.za





7.1.1.1 Affected community

The nearest communities, which form part of the Batlharo Ba Ga Bothware Traditional Authority, are situated 20km towards the northeast. Chief Pelonomi Toto was notified of the project and information regarding the mining right application was provided to him (see Table 71).

Table 71 Affected community contact details

	Name	Tel No	Fax No	Address	Email
Batlharo Ba Ga Motlhware	Chief Pelonomi Toto	072 507 2741	NA	NA	Pelo.toto@gmail.com

7.1.1.2 Land Claims

There are currently no land claims on the farm Perth 276.

7.2 Details of the engagement process

7.2.1 Description of the information provided

A Background Information Document or BID was forwarded to all IAP via hand delivery, e-mail, fax or post during the Scoping Phase (iLEH, 2011). The BID includes details of the proposed project, a map of the project area, the EMP and Public Participation Processes being followed. It also includes contact details for the Public Participation Process and the DMR.

IAPs were invited to register and send responses by fax, telephone or email to iLEH or directly to the DMR.

A comment sheet was attached to the BID sent to all IAP. Landowners and other IAP were encouraged to register as an IAP and to complete the comment sheet, to list their views and concerns and to attend the public meeting on 5 December 2011.

The Scoping Report was made available for comment to all registered IAP during January 2012. An electronic copy and hard copy of the report was hand delivered to the landowner. A hard copy of the report was made available to registered IAP at the Hotazel library.

A feedback letter was sent out via registered mail to all registered IAP on 4 April 2012 (see Appendix 11). The letter provided an update on the status of the mining right application as well as on progress made with the EIA process. The letter also contained an invitation to the Open Day on 21 April 2012.

During the Open Day, posters, handouts, information sheets and comment sheets were made available to IAP. Copies of these are presented in Appendix 11.

The draft EMP will be made available to all registered IAP on 17 May 2012 for a 30-day comment period. A hard copy of the EMP will be hand delivered to the landowner on the same day. Sebilo will meet on a one-on-one basis with the landowner on 17 May to present the information made available during the Open Day to him. He could not attend the Open Day, due to personal commitments.

All comments from IAP will be incorporated into a final Public Participation Report, which will be submitted to the DMR at the end of June 2012, once the comment period has closed.

7.2.2 List of parties consulted and those not consulted

The landowner could not be consulted directly before the draft EMP was submitted to the DMR for comment. Sebilo is however committed to consult with the landowner and for this reason, a meeting was set up for 17 May 2012 to discuss the information presented at the Open Day as well as the draft EMP.





7.2.3 List of views raised by consulted parties on the environment

- Stakeholders who are most likely to be influenced by the proposed Perth Mine are the landowner, the surrounding communities in the immediate vicinity of the proposed mining area and indirectly those community members in the outlying areas further away.
- The proposed Perth Mine may have mainly positive and some negative socio-economic impacts on the local and sending communities. These impacts may however be minimal, considering the broader impact of manganese mining in the region. The proposed mine could however contribute positively to the economy and social stability of the area through job creation, support to local suppliers, creation of secondary industries, support of local Municipalities and funding of community projects and social services.
- Sebilo intends to employ approximately 130 people on a permanent basis, as far as practically possible from the Joe Morolong and Ga-Segonyana areas. This is expected to generate a collective income of around R10 million per year. This could have a knock-on effect on suppliers of goods and services in the area.
- During the operational phase of mining, Sebilo intends to implement three LED projects, including renovation of the Manyiding School, livestock farming and the provision of sanitation in the Joe Morolong area.
- In addition to the above, the Social and Labour Plan makes provision for Human Resource Development, which could see an increase in literacy as well as a skilled labour force.
- The Batlharo Ba Ga Bothware Community will directly benefit from the proposed mining project, as this Tribal Authority has a 5% shareholding in the Perth Project. Dividends from the mining operations will be utilised for the upliftment of the community through the development of social infrastructure like building and renovation of schools, child-care facilities, entrepreneurial development and capacity building for the Tribal Authority.
- The specific negative socio-economic impacts that the proposed Perth Mine may contribute to, include the possible influx of migrants in search of jobs, the possible growth of informal settlements, the possible increase in HIV/AIDS, the possible increase in mining-related illness and pressure on infrastructure like water, electricity and roads.
- It is anticipated that farming activities on the farm Perth could be impacted due to reduced grazing and agricultural land. The current and proposed future mining activities will disturb grazing over an area of approximately 80 ha. According to the carrying capacity specialist study, approximately 15ha should be provided for one head of cattle, if overgrazing of the land is to be avoided. Based on this assessment, the landowner will be losing grazing land for around 7 animals.
- The landowner and tenant indicated that they are planning to grow lucern within the proposed project area and to irrigate the lucern with water from the pit. Available information suggests that the water in the pit will be unsuitable for irrigation, but loss of income from this possible irrigation project would be incurred over an area of approximately 30 ha.
- Borehole water, that provides drinking water to cattle, could be negatively affected during mine dewatering. This will result in a loss of agricultural activities in the vicinity of the project.
- Subsistence farmers in the surrounding communities are of the opinion that mining activities pollute water streams, depriving them of essential resources for livestock and human consumption.
- Blasting at the opencast operations and general mining activities could generate dust, which may impact negatively on grazing quality and quantity. Blasting is also known to create distress in animals and may impact on breeding processes of cattle.
- Other concerns raised by the landowner include theft, increased traffic, the quality of roads, oil spills and garbage.
- Consultation with the Traditional Authority and the Municipality identified the following impacts





on traditional communities:

- Most mines bring in own workers from outside the local areas;
 - Locals are overlooked for employment opportunities due to lack of necessary skills and expertise;
 - Areas like Kathu have reached their capacity and potential for growth which means migrants could flock to areas like Ga-Segonyane and Joe Morolong. Increase in population in areas like the Batlharo could result in a demand for housing and the mushrooming of informal settlements
 - Most migrants are skilled and professionals creating a class structure resulting in resentment and tensions with the locals;
 - Schools and child-care facilities are already full in the Batlharo area;
 - Increase in child-trafficking in the informal settlements;
 - Dilution and marginalisation of local languages and cultural practises;
 - Men leave women and children with very little remittance back home;
 - Teenagers vulnerable to moral degradation (sugar daddy syndrome);
 - Increase in teenage pregnancies and related diseases like HIV/AIDS and STDs;
 - Increase in unemployment rate as not all job-seekers are successful and some decide to stay in the area;
 - Increase in drinking and substance abuse;
 - Infiltration of Somali and Pakistani traders' threatening xenophobia attacks;
 - Increased traffic volumes (busses ferrying employees and transporting commodities);
 - Increase in road accidents related to trucks (that transport manganese); and
 - Pot-holes created by these trucks.
- Upon mine closure, the social impacts on employee households and communities are usually severe and leave people impoverished. Mine closure is often traumatic for both mine workers and their dependents and can cause severe psychological impacts on those affected. This is often associated with an escalation in crime rates and above, alcoholism and other substance abuse.
 - The Batlharo communities will earn dividends annually, but once the mining operations cease, the income will end. The worst-case scenario is that the Traditional Authority may have become dependent on mining and that the impact will be disastrous for the community. For this reason, a 10-year development plan will be developed for the Batlharo to assist in the sustainable development of the rural communities. It must be noted that the issue of dependency have not been raised during consultations with the Traditional Authority nor the municipality.

7.2.4 List of views raised by consulted parties on the impact of mining

Please refer to the information presented above.

7.2.5 Other concerns raised by consulted parties

The Issues and Response Report submitted as part of the Scoping Report for the project, is presented in Table 72. This table will be updated once comments on the draft EMP have been received. The updated Issues and Response Report will be submitted as part of the final Public Participation Report to the DMR at the end of June 2012.





Table 72 Issues and Response Report (5 December 2011)

Aspect	Person	Issues	Response
Legal basis	FH Swanepoel Public Meeting 5 December 2011	How can the DMR issue a mining right if there is a court case pending over the farm?	The court case relates to the existing manganese ore stockpiles left behind by Sebilo and not the opencast and underground mining, which is what the mining license is for. The matter must be resolved through court and cannot be discussed as part of this process
Implementation of EMP	EZ Anthonissen Public Meeting 5 December 2011	There are many mines in the surrounding area who have made promises in terms of environmental management that were not kept.	if the EMP is approved, it will be a legal document, which Sebilo must implement and audit on a regular basis. Public consultation is undertaken to identify issues to make sure they area addressed
Implementation of EMP	EZ Anthonissen Public Meeting 5 December 2011	Sebilo did not adhere to the existing land use agreement with him, entered into as part of the prospecting right. How will they adhere to the conditions of an EMP?	Sebilo has an open door policy and would like to resolve issues raised by Ds Anthonissen. There were misunderstandings on both sides regarding the land use and land access agreement. Sebilo will seek to find solutions through negotiations with the landowner
Water Management	L Swarathile – DWA Telephonic discussion	He visited the project site and noted the following: <ul style="list-style-type: none"> • Sebilo need to develop an integrated water management plan. • Sebilo must ensure that the water is treated and discharged to a plant. • Sebilo will get water supply from the Gamagara LM and will have to apply for the appropriate water use license. • DWA is aware that Sebilo is looking at appropriate ways of water management to minimise environmental impacts. 	So noted. The Surface- and Groundwater Impact Assessments will be used to identify the optimum integrated water management plan for the operations. Sebilo will apply for the necessary water use licenses for the project.
Socio-Economics	EZ Anthonissen Public Meeting 5 December 2011	He is the No 1 economically affected party. He has not been consulted. Nobody will mine on his farm to his detriment. Assmang negotiated behind his back with Sebilo. He categorically opposes the project. He will fight the project to the end, will be obstructive and will prevent Sebilo from reaching the mining project's timelines. He will also appeal the decision if a mining right is issued to Sebilo.	The Socio-economic and Soil, Land Use and Land Capability Impact Assessments will address the loss of income resulting from mining. Sebilo has an open door policy. A meeting was requested with Ds Anthonissen, but he declined to attend and asked that Sebilo talk to his lawyer. Minutes of this meeting are contained in Appendix 1.
Socio-Economics	FH Swanepoel Public Meeting 5 December 2011	He also opposes the project.	Noted. Refer to comments above.
Socio-Economics	P Toto – Bathwaro Traditional Council Telephonic Discussion	He welcomes the project in the area, as it will lead to: <ul style="list-style-type: none"> • Job opportunities for the unemployed young people. • The village will benefit through the Community Trust established by Sebilo. • The Kgosiyadi believes dividends earned will go a long way to the development of the community 	So noted. The Socio-Economic Impact Assessment will address measures to enhance the benefits of the project.





Aspect	Person	Issues	Response
Socio-Economic	T Dilotsolthe – LED Manager, JTGD Telephonic discussion	<p>He had a consultative meeting with Sebilo and proposes that Sebilo ensures the following:</p> <ul style="list-style-type: none"> • Develop an EIA • Promote secondary industries for sustainable livelihoods beyond the life of the mine. • Recruitment is in favour of local people. Importing of labour breeds resentment and hostilities in the community. • Promotion of joint ventures with the local SMMEs to accelerate participation of the locals in the supply value chain. • Guard against delayed implementation of SLPs. • SCI is not stand alone, but in line with district and LM objectives and plans. • Build on existing programmes/projects for maximum impact. • Maintain relationships with relevant government departments and be part of the re-launched LED forum. • Participate in Skills Development Programme of the District, e.g. support bursars in the community to attain mine related skills 	<p>So noted. These aspects will be included and evaluated as part of the Socio-Economic Impact Assessment to be undertaken during the EIA phase of the project.</p>
Socio-Economics	M Anthonissen Public Meeting 5 December 2011	<p>Focus is placed on empowering communities and women, but not once were the benefits to the landowner mentioned. He is concerned about their safety and their future. How will Sebilo ensure their sustainability?</p>	<p>The law prescribes that communities benefit from mining projects as part of transformation and upliftment. A mutually beneficial solution can only be achieved through consultation between Sebilo and the landowner and his family. Sebilo proposes that a meeting is held with Ds Anthonissen after the Public Meeting to start negotiations.</p>
Socio-Economics	FH Swanepoel Public Meeting 5 December 2011	<p>What rights do the landowner have?</p>	<p>The law requires Sebilo to notify the landowner of the mining right application and to consult with him regarding the proposed project. The law does not require Sebilo to get the permission of the landowner, but it is to everyone's advantage that an agreement regarding the project is reached. Sebilo promotes that a solution is found. The law separates mineral rights from surface rights, which causes conflict.</p>
Rehabilitation responsibilities	FH Swanepoel Public Meeting 5 December 2011	<p>Was the rehabilitation responsibility transferred from Assmang to Sebilo?</p>	<p>Yes, the rehabilitation responsibility was transferred to Sebilo as part of the Section 11 transfer. Sebilo has already made financial provision for rehabilitation in consultation with the DMR.</p>
Services	C Pienaar – Eskom Telephonic discussion	<p>Eskom is currently increasing their capacity and will have enough electricity to supply the mine. Sebilo should contact Eskom whenever they require clarification from Eskom's side</p>	<p>So noted. Sebilo has already entered into discussions with Eskom in this regard.</p>





7.2.6 Confirmation of appended minutes and records of consultations

The minutes of the Public Meeting held on 5 December 2012 is appended in Appendix 11. Other records of consultation are also contained in Appendix 11.

7.2.7 Information regarding objections received

The landowner objects to the Sebilo mining right application.

7.3 Manner in which issues raised were addressed

The issues raised by IAP were addressed as part of the Socio-Economic specialist study undertaken by MWA (2012) for the mining right application. More details regarding the proposed socio-economic impact management plan, are provided in Table 55.10.





8 ENVIRONMENTAL AWARENESS PLAN

Undertaken in terms of Section 39(3)(c) of the MPRDA.

8.1 Employee communication process

The On-Site Communication Procedure is discussed in detail in Section 3.7.2 above. Information is presented on the requirements for site instructions, ECO diary entries, method statements for work in sensitive areas and record keeping.

8.2 Description of solutions to risks

The EMP developed for the project, is presented in Tables 55.1 – 55.10 as well as in Tables 56 – 61. The manner in which risks will be dealt with to avoid or minimise pollution is described in detail in these tables, as well as in Section 3.2.2 above.

8.3 Environmental awareness training

Induction training will be conducted on all personnel and contractors involved in the mining project, prior to the commencement of any work or mining. The environmental awareness programme will be aimed at all levels of management and staff. Training will involve all the relevant components of the EMP including:

- Access, including use of roads, tracks, gates, etc (as detailed in Table 55.1).
- Control measures required to manage excluded and exempted areas.
- The handling, storage and disposal of waste (as detailed in Table 55.8).
- Weed control (as detailed in Table 55.2).
- Fire prevention and emergency response (as detailed in Table 57).
- Spill control and management (as detailed in Table 56).
- Sediment and erosion control (as detailed in Table 55.5).
- Control measures to be implemented with regards to the management of water, noise and dust (as detailed in Tables 55.3, 55.4 and 55.6).
- Rehabilitation of drilling sites and access tracks (as detailed in Table 67).

The Induction Report will be signed by the mining contractor, the ECO, as well as the person undergoing the induction. Records will be kept by the ECO for auditing purposes. Refresher training will be undertaken annually following the Performance Assessment Audit on environmental compliance for the project.

Toolbox training and discussions on rectification of non-compliances will form part of the environmental awareness plan. All workers will receive weekly toolbox talks that will be presented by the Project Manager or his/her representative, the ECO or individual contractors. Themes for toolbox talks may include a general description of what the environment is, why it needs to be protected, environmental aspects and impacts of the mining work programme, what each person can do to minimise impacts, managing waste, spillage reporting and prevention, driving restrictions and environmental management requirements.





9 CAPACITY TO REHABILITATE AND TO MANAGE IMPACTS

Undertaken in terms of Section 39(4)(a)(iii) of the MPRDA.

Sebilo has the capacity to undertake rehabilitation and to minimise negative impacts on the environment in terms of Section 39(4)(a)(iii) of the MPRDA. The Rehabilitation Plan for the project is detailed in Section 6.1.1 and financial provision for rehabilitation is detailed in Section 9.1. Suitably qualified people will be appointed to the project to ensure that all commitments in the EMP are met. These people will receive adequate training according to the details in Section 8.3.

9.1 Annual environmental costs

The information presented in this section is based on available information and will be confirmed as part of the compilation of the EMP for the project. It is assumed that:

- The cost of auditing and inspection on site will be included in the salary of the Environmental Control Officer (ECO) that Sebilo will employ for the project. No specific provision was therefore made.
- The cost of rectification of non-compliances cannot be estimated at present. It is assumed that these costs will form part of the operational budget for the project. A provision of ±R15000 per annum should however be included in the environmental budget for spill clean ups and so forth.
- The quality of water in the two PCDs will be monitored monthly with a hand-held instrument to ensure that the water is suitable for re-use and for dust suppression. It is recommended that the quality of the water in the PCD is monitored for a full analysis twice a year.
- Five Sebilo groundwater monitoring boreholes and 18 private boreholes will be monitored on a quarterly and bi-annual basis. Additional boreholes may be required, based on the results of the groundwater specialist study to be undertaken as part of the EMP for the mining project.
- It was assumed that five dust buckets will be installed down wind of the operations to monitor the impact of mining on air quality and the effectiveness of dust suppression measures. The necessity of watering gravel roads and mine working areas will be triggered by this monitoring programme, especially during the dry winter months.
- The mine will monitor noise levels on a quarterly basis at the operations.
- The EMP will be linked to the monitoring programme to ensure that effective management measures are triggered if the monitoring programme indicates exceedances.

The approximate annual environmental costs, as presented in Table 73, is estimated to be around R156 300.

Sebilo will make provision for environmental monitoring as part of its annual operating budget. The costs presented in Table 73 must be incorporated into the Mine Work Programme (MWP) for the project.

The MWP must further include the cost of the salary for the ECO. It is recommended that this person is appointed on the Patterson C-Band level to ensure that environmental commitments are managed efficiently.





Table 73 Anticipated operating environmental monitoring costs

Monitoring activity	Frequency	Responsibility	Management Action	Approximate annual cost
Check compliance with all conditions of the EMP.	Monthly	ECO	Rectify non-compliances immediately.	R15 000
Visual inspection of erosion control measures.	Monthly	ECO	Rectify non-compliances immediately.	No cost*
Inspection of the storage area for visible signs of pollution.	Weekly	ECO	Rectify non-compliances immediately.	No cost*
Soil monitoring	Annually	ECO	Clean up and remove contaminated soil. Dispose safely	R5 000
Alien invasive species	Monthly	ECO	Inspections and removal of plants	R7 000
Surface water: up- and downstream of operations	Bi-annually: full analysis	ECO	Implement management plan if exceedances occur	R7 000
Surface water: Pollution Control Dams	Monthly: pH, EC, TDS Bi-annually: Full analysis	ECO	Dams will be lined and are sized to manage stormwater. Monthly analysis with hand-held instrument.	Hand-held instrument: R9 000 Analysis: R7 000
Groundwater: 18 private boreholes	Bi-annually	ECO	To establish a baseline against which to monitor impacts	R54 000
Groundwater: 5 mine boreholes	Quarterly	ECO	Borehole used to trigger management plan, as required	R30 000
Air quality	Monthly	ECO	Dust suppression, like watering of road and workings surfaces	R10 000
Waste separation and removal	Monthly	Site Manager	Reduce, reuse and recycle	R 12 000
Rainfall	Daily	ECO	A portable rain gauge will be erected at each site.	Rain gauge: R300
Total Estimated Environmental Monitoring Cost				R156 3000

* No costs other than the salary of the ECO. The cost of rectification cannot be estimated at present. It was assumed that these costs would form part of the operational budget for the mining project.

9.2 Integration with Mining Work Programme

Sebilo herewith confirms that the information presented in this EMP will be reflected in the updated Mining Work Programme.





10 UNDERTAKING

Undertaking to execute the EMP in terms of Regulation 52 (2) (h) of the MPRDA.

Herewith I, the person whose name and identity number is stated below, confirm that I am the person authorised to act as representative of the applicant in terms of the resolution submitted with the application, and confirm that the above report comprises EIA and EMP compiled in accordance with the guideline on the Departments official website and the directive in terms of sections 29 and 39 (5) in that regard, and the applicant undertakes to execute the Environmental management plan as proposed.

Full Names and Surname	Tobogo BATHOLOMEW Louw
Identity Number	66122958 17080

-END-





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