

EMP Number	Technical and Management Commitments	Scheduling	Project Phase	
			Construction	Operation
1	APPOINTMENTS, ROLES AND RESPONSIBILITIES	.	.	.
1.1	Sishen Iron Ore Company (SIOC) as owner of the Kathu Supplier Park	.	.	.
	Environmental Aspect / Impact Source:	.	.	.
	Non-compliance with the EMP due to a lack of understanding and delegation of responsibilities.	.	.	.
	Goals and Objectives:	.	.	.
	Define organisational and administrative arrangements for EMP implementation. Adequate management and mitigation of environmental impacts.	.	.	.
	Mitigation Measures:	.	.	.
1.1.1	SIOC will be the holder of the environmental approvals (environmental authorisation and water use license).	Ongoing	Y	Y
1.1.2	SIOC to notify the competent authorities as soon as any of the contact details of the holder of these authorisations change, including the name of the responsible person, the physical or postal address and/or telephonic details.	Ongoing, as required.	Y	Y
1.1.3	SIOC is ultimately responsible for the implementation of the EMP during construction and operation phases of the project.	Ongoing	Y	Y
1.1.4	SIOC to appoint a capable and suitably qualified and responsible Environmental Control Officer (ECO) to oversee implementation of the EMP during construction phase of the project. The ECO to be appointed prior to the start of construction. The competent authorities to be notified of the details and contact numbers of the appointee in writing for record and communication purposes. Authorities to be notified about staff changes or when responsibilities are delegated to an alternative person.	Ongoing	Y	.
1.1.5	SIOC to use a capable and suitably qualified Environmental Auditor (EA) to audit compliance with the EMP at the required intervals. The EA to be external to the Kathu Supplier Park. The details of the appointment to be submitted to the competent authorities on request.	Quarterly during construction.	Y	.
1.1.6	SIOC to appoint a project manager (PM) to oversee the construction phase of the project.	Ongoing	Y	.
1.1.7	SIOC to ensure that all appointed Contractors are bound to implement the EMP as it applies to the Contractors' line of work.	Ongoing	Y	.
1.1.8	Should any activity be planned on the site that requires an environmental authorisation, permit or license approval, which is not covered by existing authorisations or approvals, appropriate applications for authorisations and approvals must be lodged with the competent authorities. These includes listed activities in terms of the MPRDA, NEMA, NEMWA, and NWA as well as other environmental acts and regulations.	As required.	Y	.

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1.1.9	Should the ownership of the Kathu Supplier Park or any of the associated infrastructure be transferred from SIOC to any other juristic person, it must be formally recorded in writing and submitted to the competent authorities. The future holder of the authorisation will be required to take ownership of the implementation of the conditions of the EMP and the conditions of all approvals upon transfer of ownership.	If and when required.	Y	Y
1.2	Environmental Control Officer (ECO)	.	.	.
	Environmental Aspect / Impact Source:	.	.	.
	Non-compliance with the EMP due to a lack of understanding and delegation of responsibilities.	.	.	.
	Goals and Objectives:	.	.	.
	Define organisational and administrative arrangements for EMP implementation. Adequate management and mitigation of environmental impacts.	.	.	.
	Mitigation Measures:	.	.	.
1.2.1	The ECO to oversee the implementation of the EMP on a day to day basis, verifying that the EMP mitigation measures and conditions of all authorisations and approvals are adhered to at all times, and to act as guide and advisor to Contactors, the SHE officer and SIOC personnel on matters related to EMP implementation.	Ongoing	Y	.
1.2.2	Where necessary, the ECO to develop and oversee implementation of EMP procedures, to give effect to the commitments of the EMP. EMP procedures are live documents and the ECO may amend them from time to time to bring them in line with environmental conditions and issues pertaining to the Kathu Supplier Park and surroundings.	As required.	Y	.
1.2.3	Where necessary, the ECO to issue EMP instructions to Contractors, SIOC personnel or any party present on site to address and correct non-compliances with the EMP and specific environmental issues pertaining to the Kathu Supplier Park and surroundings.	As required.	Y	.
1.2.4	The ECO to provide a copy of the EMP (and all updates / amendments) to Contractors appointed by SIOC. Records to be kept of documents issued, including details and signature of Contactors' responsible person to whom the documents were issued.	As required.	Y	.
1.2.5	The ECO to provide copies of EMP procedures (and all revisions) to Contractors appointed by SIOC, if the procedures apply to the nature of their activities and contract with SIOC. The ECO to keep proof that documentation has been provided to the Contractor.	As required.	Y	.
1.2.6	The ECO to be responsible for regular internal inspections of the Kathu Supplier Park area and surroundings to monitor and verify that the EMP is implemented and that environmental impacts are kept to a minimum during construction and operation. Records of findings to be kept and submitted to SIOC management.	Weekly inspections. EMP verification every two months.	Y	.

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1.2.7	The ECO to arrange, facilitate, attend and minute regular meetings to discuss environmental performance and EMP implementation with the Contractors' SHE officers.	Monthly.	Y	.
1.2.8	The ECO to keep records of all matters concerning compliance monitoring, environmental performance and EMP implementation in the incident reporting system and to make it available for inspection to a relevant and competent authority in respect of this project.	Ongoing, as required.	Y	.
1.2.9	The ECO to keep a legal register, listing legislation applicable to the project and a summary of how the legislation applies to the project.	Ongoing	Y	.
1.2.10	The ECO to keep copies of the approved EMP and all authorisation / approval letters on site. The authorisations / approvals to be produced to authorised officials of a relevant or competent government department who requests to see it and to be made available for inspection by any employee or agent of the holder of the authorisation who works or undertakes work at the site.	Ongoing	Y	.
1.2.11	In addition to EMP compliance, the ECO is to monitor overall environmental compliance with relevant legislation.	Annually	Y	.
1.2.12	The ECO shall maintain copies of all reports submitted to the competent authorities.	Ongoing	Y	.
1.2.13	The ECO shall maintain copies of all correspondence to and from competent authorities.	Ongoing	Y	.
1.2.14	The ECO to produce regular environmental reports for submission to the EA and SIOC management, covering EMP compliance, general environmental performance, incidents, complaints, EMP procedures and instructions issued, and results of meetings and inspections during the reporting period.	Quarterly.	Y	.
1.2.15	The ECO is to submit compliance reports to the EA and SIOC Management / PM.	Quarterly.	Y	.
1.2.16	The ECO to report environmental incidents and major EMP non-compliances (that could result in significant environmental damage or pollution) to the SIOC Management / PM who will then be responsible to report to competent authorities.	As soon as possible, but at least within 24 hours.	Y	.
1.2.17	The ECO is to manage environmental incidents in accordance with a formal incident response and reporting procedure.	Ongoing, as required.	Y	.
1.2.18	The ECO to oversee environmental awareness induction training to all contractor staff.	Prior to individuals starting work on site.	Y	.
1.2.19	The ECO to ensure that the necessary environmental induction training takes place and that records of attendance are maintained and up to date.	Ongoing		.

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1.2.20	The ECO to put in place an incident reporting procedure and to keep this up to date at all times.	At start of construction phase, ongoing thereafter.	Y	.
1.2.21	Other duties as listed as being the ECO's responsibility under various EMP headings.	Ongoing	Y	.
1.2.22	The ECO to manage the process of submitting any proposed changes/amendments to the EMP to the competent authorities for approval before such changes can be implemented.	Every six months, or as required.	Y	.
1.2.23	ECO to arrange regular submission of monitoring and compliance reports (performance assessments and other audits) to competent authorities as required by the various authorisations issued.	Quarterly	Y	.
1.3	Environmental Auditor (EA)	.	.	.
	Environmental Aspect / Impact Source:	.	.	.
	Non-compliance with the EMP due to a lack of understanding and delegation of responsibilities.	.	.	.
	Goals and Objectives:	.	.	.
	Define organisational and administrative arrangements for EMP implementation. Adequate management and mitigation of environmental impacts.	.	.	.
	Mitigation Measures:	.	.	.
1.3.1	The EA (or an independent environmental consultant / mediator) to act as independent party during disputes.	Quarterly	Y	.
1.3.2	The EA to compile environmental compliance audit reports to SIOC for submission to competent authorities (DEA and DW&S).	Quarterly	Y	.
1.4	Contractors	.	.	.
	Environmental Aspect / Impact Source:	.	.	.
	Non-compliance with the EMP due to a lack of understanding and delegation of responsibilities.	.	.	.
	Goals and Objectives:	.	.	.
	Define organisational and administrative arrangements for EMP implementation. Adequate management and mitigation of environmental impacts.	.	.	.
	Mitigation Measures:	.	.	.
1.4.1	Contractors to familiarise themselves with the EMP and to ensure that contract prices allow for environmental legal compliance and costs associated with EMP implementation.	Ongoing	Y	.
1.4.2	Contractors to comply with the EMP where it applies to the nature of their activities and contract with SIOC.	Ongoing	Y	.

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1.4.3	Contractors to implement EMP amendments, EMP procedures and written EMP instructions issued to them by the ECO, within the timeframe specified by the ECO in the EMP procedure or instruction.	Ongoing	Y	.
1.4.4	Contractors not to deviate from the EMP or procedures and instructions issued by the ECO without written approval by the ECO.	Ongoing	Y	.
1.4.5	Contractors to ensure that their workforce, sub-contractors and suppliers comply with the EMP.	Ongoing	Y	.
1.4.6	Contractors to be responsible for rectifying and rehabilitating, at their own expense, any environmental damage caused by their activities on the Kathu Supplier Park and surroundings. Measures to repair damage and rehabilitate the affected area to be approved and signed off by the ECO.	Ongoing	Y	.
1.4.7	Contractors shall nominate a capable and suitably qualified staff member as SHE officer to supervise implementation of the EMP as it applies to the nature of the contract with SIOC. For the purposes of the EMP, a SHE officer shall mean a staff member that has attended an environmental management system or environmental audit course or has a proven track record of managing site environmental matters.	At start of construction phase.	Y	.
1.5	Contractor SHE Officer	.	.	.
	Environmental Aspect / Impact Source:	.	.	.
	Non-compliance with the EMP due to a lack of understanding and delegation of responsibilities.	.	.	.
	Goals and Objectives:	.	.	.
	Define organisational and administrative arrangements for EMP implementation. Adequate management and mitigation of environmental impacts.	.	.	.
	Mitigation Measures:	.	.	.
1.5.1	Each SHE officer to identify all EMP sections (as may be amended from time to time) that apply to the Contractor's activities and contract with SIOC and to ensure implementation of these sections.	Ongoing	Y	.
1.5.2	Each SHE officer to identify EMP procedures issued by the ECO that apply to the nature of their activities and contract with SIOC and to ensure that these EMP procedures are implemented within the timeframe specified in the EMP procedure.	Ongoing	Y	.
1.5.3	Each SHE officer to ensure that EMP instructions issued to them, are implemented within the timeframe specified in the EMP instructions.	As required.	Y	.
1.5.4	Each SHE officer to inspect areas in which the Contractor operates to verify EMP compliance.	Daily	Y	.
1.5.5	Each SHE officer to attend meetings with the ECO and to bring environmental issues and problems with implementation of the EMP to the attention of the ECO.	Monthly, or as required.	Y	.

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1.5.6	Each SHE officer to report environmental incidents, complaints, and major EMP noncompliances (that could result in notable environmental damage or pollution) to the ECO.	As soon as possible, but at least within 24 hours.	Y	.
1.5.7	Each SHE officer to submit regular environmental inspection reports to the ECO, covering EMP compliance and progress with the implementation of EMP procedures and EMP instructions applicable to the reporting period.	Monthly	Y	.
1.6	SIOC Project Manager	.	.	.
	Environmental Aspect / Impact Source:	.	.	.
	Non-compliance with the EMP due to a lack of understanding and delegation of responsibilities.	.	.	.
	Goals and Objectives:	.	.	.
	Define organisational and administrative arrangements for EMP implementation. Adequate management and mitigation of environmental impacts.	.	.	.
	Mitigation Measures:	.	.	.
1.6.1	The project manager (PM) is to act on SIOC's behalf during construction of the project.	Ongoing	Y	.
1.6.2	The PM is to report environmental incidents, complaints, and major EMP non-compliances (that could result in notable environmental damage or pollution) to the ECO.	As soon as possible, but at least within 24 hours.	Y	.
1.6.3	The PM is to approve the Contractors' nomination of SHE officers.	Ongoing	Y	.
1.7	Competent Authorities for the Project	.	.	.
1.7.1	DENC: for matters related to the National Environmental Management Act, 1998 (NEMA, No. 107 of 1998).	Ongoing	Y	Y
1.7.2	DW&S: for matters related to the National Water Act, 1998 (NWA, No. 36 of 1998), the WULA and technical report and conditions of the water use license record of decision.	Ongoing	Y	Y
2	TRAINING, AWARENESS AND COMPETENCE	.	.	.
	Environmental Aspect / Impact Source:	.	.	.
	Environmental impacts resulting from an insufficient understanding of risks associated with work conditions and job description, resulting in insufficient "duty of care".	.	.	.
	Goals and Objectives:	.	.	.
	Ensure adequate knowledge and understanding of EMP stipulations, policies and procedures. Understanding the interface between the work environment and environmental protection.	.	.	.
	Mitigation Measures:	.	.	.

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2.1	All construction workers, suppliers and service providers entering the construction site to attend and undergo environmental awareness induction training session covering key environmental issues pertaining to the construction site and surroundings.	Upon appointment and before entering the construction site.	Y	.
2.2	Maintain a record of all individuals attending an environmental induction session.	Ongoing	Y	.
2.3	Individuals dealing with potential hazardous situations that could lead to hazardous spills, pollution incidents, excessive dust or other forms of environmental damage to receive appropriate job-specific training and to be aware of the risks and potential consequences of their appointment and work situation, how to avoid environmental impacts and how to respond during an environmental incident or emergency situation.	Ongoing	Y	.
2.4	Maintain a record of all individuals receiving job-specific training.	During each training session.	Y	.
3	COMPLAINTS REGISTER AND MANAGEMENT	.	.	.
	Environmental Aspect / Impact Source:	.	.	.
	Hazardous spills, pollution occurrences, excessive dust or other forms of environmental damage. Recurring environmental incidents. Complaints by third parties.	.	.	.
	Goals and Objectives:	.	.	.
	Adequately assess root cause of incidents in order to develop and implement appropriate corrective actions and prevent incidents from recurring.	.	.	.
	Mitigation Measures:	.	.	.
3.1	A detailed grievance mechanism to be established for communities to lodge concerns, suggestions and complaints which can be dealt with by the Kathu Supplier Park in a timely manner.	Prior to construction.	Y	Y
3.2	A complaints register and procedure to be put in place and kept up to date at all times.	At start of construction phase, ongoing thereafter.	Y	.
3.3	Complaints to be reported in writing as per the complaints procedure.	As required	Y	.
3.4	All complaints to be investigated and appropriate corrective actions to be implemented, including measures to prevent recurring complaints.	As required	Y	.

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3.5	Upon completion of construction, an operations phase complaints register and procedure to be put in place and kept up to date at all times.	At end of construction, ongoing thereafter.	.	Y
4	MONITORING AND AUDITING	.	.	.
	Environmental Aspect / Impact Source:	.	.	.
	Continued environmental degradation due to a lack of information about environmental performance. Lack of communication may result in delays in adequately addressing pertinent environmental issues. Legal non-compliance.	.	.	.
	Goals and Objectives:	.	.	.
	Provide information and ensure early detection of the impact of the construction activities upon the receiving environment. Recognise environmental changes in order to enable analysis of their cause. Maintain accurate records and transparent communication with regulatory bodies. Keeping regulatory body up to date with the development.	.	.	.
	Mitigation Measures:	.	.	.
4.1	General compliance with the EMP to be monitored and verified through regular inspections of the construction site and surroundings.	Daily	Y	.
4.2	The Contractors' activities and their compliance with the EMP to be monitored and verified through regular inspections of areas where the Contractors operate.	Weekly	Y	.
4.3	Records of the timeframes and scope of monitoring and verification inspections to be kept on file.	Weekly	Y	Y
4.4	Monitoring and inspections to be conducted as outlined in the individual sub-sections of the EMP (i.e. dust deposition through visual and/or dust buckets if required). Records will be kept on file.	As required.	Y	Y
4.5	Regular meetings to be conducted between SHE Officers and ECO to discuss EMP compliance and/or environmental issues and/or an environmental awareness topics and general environmental performance. Minutes of meetings will be kept on file.	Monthly	Y	.
4.6	Written EMP instructions to be issued to Contractors to address non-compliances with the EMP or other environmental issues related to the Contractors' activities on the construction site and surroundings. All instructions and records of measures implemented to address the issues will be kept on file.	As required	Y	.

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4.7	Regular environmental audits will be conducted, covering:	Quarterly, or as required	Y	.
4.7.1	Compliance with environmental authorisation and license conditions.	Quarterly, or as required	Y	.
4.7.2	Compliance with the EMP.	Quarterly, or as required	Y	.
4.7.3	Adequacy of the EMP and level of environmental-legal compliance.	Quarterly, or as required	Y	.
4.7.4	Recommendations for EMP amendments to address inadequacies.	Quarterly, or as required	Y	.
4.7.5	EMP procedures to be developed and issued to the Contractors.	Quarterly, or as required	Y	.
4.7.6	EMP instructions to be issued to the Contractors.	Quarterly, or as required	Y	.
4.8	Environmental monitoring during operations as per established development owner practices.	Ongoing, or as required.	.	Y
5	ENVIRONMENTAL RISKS AND EMERGENCIES	.	.	.
	Environmental Aspect / Impact Source:	.	.	.
	Negative public perception. Community mobilisation.	.	.	.
	Goals and Objectives:	.	.	.
	Ensure control measures are developed and implemented to ensure efficient and effective response to emergency incidents/ events.	.	.	.
	Mitigation Measures:	.	.	.
5.1	Potential significant environmental risks and emergency situations will be identified and specific emergency procedures will be developed.	At start of construction, as required thereafter.	Y	Y

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5.2	Emergency response planning to be undertaken with input from municipal health and emergency services and local police.	At start of construction, as required thereafter.	Y	Y
5.3	Interactive and hands-on competency training will be provided for individuals responsible for emergency response.	Upon appointment, as required thereafter.	Y	Y
5.4	Telephone numbers of emergency services, including fire fighting service, shall be clearly displayed on notice boards.	Ongoing	Y	Y
5.5	Access to potentially hazardous areas on the site will be restricted. Appropriate 'no entry' signage will be in place.	Ongoing	Y	Y
5.6	All personnel and Contractors will obtain approval from SIOC prior to entering restricted areas.	Before entering prohibited areas	Y	Y
5.7	The perimeter of the construction area will be fenced to prevent members of the public and livestock accessing the construction and other potential hazardous areas.	Ongoing	Y	Y
5.8	All fences will be routinely inspected and maintained.	Weekly	Y	Y
6	HYDROLOGY, WATER USE AND CONSUMPTION	.	.	.
	Environmental Aspect / Impact Source:	.	.	.
	Depletion of natural water resources.	.	.	.
	Goals and Objectives:	.	.	.
	Optimisation of natural resource consumption and conservation.	.	.	.
	Mitigation Measures:	.	.	.
6.1	Minimise water consumption, create awareness and encourage all staff to use water sparingly.	Ongoing	Y	Y
6.2	Ensure adequate maintenance of water tanks, pipes and taps and repair all drips and leaks as soon as possible.	Ongoing, within 24 hours of detection.	Y	Y
7	SOIL	.	.	.
	Environmental Aspect / Impact Source:	.	.	.
	Soil disturbance, loss of nutrients, loss of topsoil cover, loss of in situ structure and physical / chemical properties, soil compaction and erosion. Local soils associated with thin topsoil layer. Deficiency of topsoil in the Kathu area.	.	.	.

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	Goals and Objectives:			
	Optimise availability and viability of soil as growth medium to enable sustainable vegetation cover after rehabilitation. Maximise topsoil availability for rehabilitation of construction areas and disturbed areas at the Kathu Supplier Park.			
	Mitigation Measures:			
7.1	Soils to be handled in dry weather conditions to result in a little compaction as possible.	Ongoing	Y	.
7.2	Soil stripping to only occur where soils are to be disturbed by activities that are described in the design report, and where a clearly defined end rehabilitation use for the stripped soil has been identified.	Ongoing	Y	.
7.3	All available and utilisable (topsoil and upper portion of subsoil - B2/1 Horizon) to be stripped from areas affected by construction within the footprint of the Kathu Supplier Park.	Ongoing	Y	.
7.4	An average utilisable soil depth of 600 m (or until hard rock/ calcrete is encountered) to be stripped over areas of deep excavations (foundations etc.) where possible.	Ongoing	Y	.
7.5	An average utilisable soil depth of 300 m to be stripped over areas of infrastructure development (offices, workshops, access roads, terraces) where possible.	Ongoing	Y	.
7.6	Soils to be stripped effectively during the less windy months to reduce erosion and assist stockpiling and natural regeneration of vegetative cover to propagate.	As required.	Y	.
7.7	Utilisable soil to be stripped and stockpiled separately from the lower "B" horizon and all softs (decomposed rocks).	Ongoing	Y	.
7.8	Wet based soils (wetland pan areas) to be seperately stripped and stockpiled from the dry soils (colluvial and soft rock overburden). In turn, the colluvial (shallower) derived materials to be stored separately from the soft rock overburden.	Ongoing	Y	.
7.9	All vegetation to be stripped and stored as part of the utilisable soil. Only large bushes to be removed prior to stripping).	Ongoing	Y	.
7.10	Topsoil will be stockpiled for later reuse in rehabilitation of embankments and cuttings.	Ongoing	Y	.
7.11	The EA will approve the location and design (i.e. height and erosion control measures) of stockpiles.	As required	Y	.
7.12	Soil stockpiles will be demarcated and clearly marked to identify both the soil type and the intende area of rehabilitation.	Ongoing	Y	.
7.13	Stockpiles to be located in close proximity to the source and in a position that will be convenient for the final rehabilitation of the facilities.	Ongoing	Y	.
7.14	Stockpiles will not be located in wetlands / pans, areas prone to flooding or where the flow of water could cause ponding of water or soil erosion.	Ongoing	Y	.
7.15	Soils to be stockpiled as berms or as low stockpiles. Heights of all stockpiles to be minimised to not more than 1.5 m where possible to reduce wind erosion, loss of materials and to avoid compaction and damage to the seed pool.	Ongoing	Y	.

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7.16	Where stockpiles higher than 1.5 m cannot be avoided, stockpiles to be benched to a maximum height of 15 m. Each bench should ideally be 1.5 m high and 2 m wide. For storage periods greater than 3 years, vegetative (vetiver hedges and native grass species) or rock cover will be essential, and should be encouraged using fertilisation and induced seeding with water and/ or the placement of rock. The stockpile side slopes should be stabilised at a slope of 1 in 6 in order to promote vegetation growth and reduce run-off related erosion.	Ongoing, as required.	Y	.
7.17	Location of stockpiles to ensure easy access and avoid areas for future development.	As required	Y	.
7.18	Soils to be ameliorated (cultivated by means of watering and/ or fertilisation). This is required to enhance the growing capability of stockpiled soils so that they are available for rehabilitation and to sustain the soils ability to retain oxygen and nutrients, therefore sustaining vegetative material and maintaining the soils viability during storage, and to protect the soils and combat erosion by wind and water.	Ongoing	Y	.
7.19	No rock material to be placed on the stockpiles.	Ongoing	Y	.
7.20	Stockpiles will be established/ engineerd with storm water diversion berms in place to prevent run off erosion.	Ongoing	Y	.
7.21	Stockpiles to be protected from contamination.	Ongoing	Y	.
7.22	Stockpiles will be kept free from all alien vegetation and weeds.	Ongoing	Y	.
7.23	Equipment movement on top of the stockpiles will be limited to avoid topsoil compaction and subsequent damage to the soils and seedbank.	Ongoing	Y	.
7.24	Soils that are compacted as a result of construction activities outside of the development footprint to be ripped and profiled, special attention to be paid to alien invasive control within these areas.	Ongoing	Y	.
7.25	Impacted area to be minimised.	Ongoing	.	Y
7.26	Soils to be replaced timorous to minimise the area of disturbance.	Ongoing	.	Y
7.27	Soils to be adequately protected from wind and water erosion.	Ongoing	.	Y
7.28	Soils to be effectively covered and protected from wind (dust) and dirty water contamination.	Ongoing	.	Y
8	STORMWATER, EROSION AND SEDIMENTATION	.	.	.
	Environmental Aspect / Impact Source:	.	.	.
	Degradation of wetland pan water quality and habitats. Loss of growth medium.	.	.	.
	Goals and Objectives:	.	.	.

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	Adhere to applicable effluent discharge standards. Minimise impacts on downstream wetland pan ecosystems. Limit the loss of growth medium (soil) and prevent sedimentation of downstream drainage systems.	.	.	.
	Mitigation Measures:	.	.	.
8.1	Areas where wind and water erosion becomes a problem will be stabilised and protected as soon as practically possible. Protection measures may include berms, trenches, channels, and benches to divert or attenuate stormwater, or rock cladding, gabions, sodding, hydro seeding, planting, soil binders, etc.	As required	Y	Y
8.2	Sedimentation traps / berms will be installed below extensive earthworks and unvegetated areas where erosion is found to be problematic, including soil stripping operations, and stockpiles.	As required	Y	Y
8.3	Regular inspection of attenuation ponds and sediment traps for maintenance purposes.	Weekly	Y	Y
8.4	Regular maintenance of attenuation ponds and sediment traps.	Ongoing, as required.	Y	Y
8.5	Appropriate measures to be included in the lease agreements of tenants for the separation of oil and stormwater flow at the individual erven and facilities within the Kathu Supplier Park. The construction and maintenance will be the onus of each developer.	Prior to operation.	.	Y
8.6	Should erosion of wetland banks become a problem as a result of construction activities, these areas will be stabilised and protected. Protection measures could include attenuation structures, gabions, rock cladding, etc.	Annually	Y	Y
8.7	Erosion protection measures and measures to control sedimentation problems will be approved by the EA.	Ongoing	Y	.
8.8	Exposed areas associated with topsoil stripping and vegetation removal in advance of infrastructure developments will be kept to a minimum.	Ongoing	Y	.
8.9	Water used for dust suppression shall be in quantities small enough not to generate significant run-off that could result in erosion.	Ongoing	Y	.
8.10	Stockpiling of gravel, cut, fill or any other material (e.g. soil) to be limited in degraded areas or footprint areas where future buildings and infrastructure are planned. The Contractor to indicate the proposed areas and method of undertaking these activities in a method statement to be submitted to the ECO for approval before these activities commence.	Prior to construction, ongoing.	Y	.
8.11	The Contractor to ensure that the stockpiled material does not blow or wash away, or mix with each other. If the material is in danger of being washed or blown away, the contractor to cover it with a suitable material such as hessian, netting or plastic.	Prior to construction, ongoing.	Y	.
8.12	The Contractor to take reasonable measures to control the erosive effects of storm water runoff, especially where excavation and construction activities form temporary channels.	Prior to construction, ongoing.	Y	.

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8.13	Earth deflection berms to be used on sections of pipelines that exceed a slope of 1:3. A method statement in this regard shall be submitted to the ECO prior to commencement of pipeline construction.	Prior to construction, ongoing.	Y	.
8.14	All roadways, drains and storm water control facilities to be kept clean.	Ongoing	.	Y
9	HERITAGE RESOURCES	.	.	.
	Environmental Aspect / Impact Source:	.	.	.
	Damage or loss of cultural, historical sites, artefacts or graves if such sites are unearthed during site operations.	.	.	.
	Goals and Objectives:	.	.	.
	Implement measures to avoid disturbance or loss of important heritage sites and artefacts, including graves. Due to the fact that subterranean Stone Age material is known from the surroundings of the study area, the following general recommendations are required.	.	.	.
	Mitigation Measures:	.	.	.
9.1	Known heritage sites, artefacts and graves within 500 m from construction activities to be fenced, signposted and protected from damage, unless a permit approving their destruction has been obtained.	Prior to construction	Y	.
9.2	An archaeologist suitably qualified in Stone Age fieldwork and research must be appointed to undertake an Archaeological Watching Brief, and will be responsible for the following:	Prior to construction	Y	.
9.2.1	Provide training to the ECO in Stone Age archaeology and the identification of Stone Age artefacts and sites.	Ongoing	Y	.
9.2.2	Conduct an archaeological monitoring program whereby the construction site is visited.	Bi-weekly for first 3 months.	Y	.
9.2.3	On-site assessment of any Stone Age material exposed and the provision of recommendations for the way in which the exposed material must be mitigated.	As required.	Y	.
9.2.4	Compile and submit an archaeological monitoring report at the end of the monitoring process.	End of construction	Y	.
9.3	The ECO will be responsible for on-site archaeological monitoring.	Daily	Y	.
9.4	If an unknown grave or artefact is unearthed during soil stripping or earthworks, reasonable measures will be implemented to prevent damage to the grave or artefact.	As required.	Y	.
9.5	Should any Stone Age material or any archaeological material such as artefacts, graves or protected and endangered biota be identified, all construction activities in that area must immediately stop and the ECO notified.	As required.	Y	.
9.6	The ECO to demarcate a construction free area around the discovery and to contact the archaeologist (or alternatively the McGregor Museum) immediately.	As required.	Y	.

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9.7	The archaeologist to visit the construction site to identify and assess the exposed Stone Age or archaeological material. After assessing the exposed material the archaeologist would provide recommendations for the exposed material which may range from destruction without mitigation (if the exposed material is found to be of little significance) to archaeological mitigation (if the exposed material is found to be significant).	As required.	Y	.
9.8	The Stone Age or archaeological material will not be removed and work at the site will not resume until clearance is given by the specialist for removal or work to continue.	As required	Y	.
9.9	The Stone Age or archaeological material will not be disturbed or relocated until the necessary permits have been obtained where applicable.	As required	Y	.
9.10	All monuments and historical sites to be treated with the utmost respect. No destruction of any site to be allowed. Interference with graves is strictly prohibited.	Ongoing	Y	.
10	DUST	.	.	.
	Environmental Aspect / Impact Source:	.	.	.
	Fugitive dust emissions due to low rainfall figures, material composition and particle sizes, and impacts due to location of residences.	.	.	.
	Goals and Objectives:	.	.	.
	Develop and implement appropriate dust control measures according to the risk profile of the project.	.	.	.
	Mitigation Measures:	.	.	.
10.1	The CM and ECO will develop and maintain up to date procedures for dust control at potential problem areas and near sensitive receptors.	At start of construction, as required thereafter	Y	.
10.2	Strict dust control measures will be maintained on gravel / non-surfaced roads used by construction-related vehicles (wet and chemical suppression and road maintenance).	Ongoing	Y	.
10.3	Dust generation and other disturbances in close proximity to residences to be kept to a minimum, especially during times when the wind direction is towards nearby residences.	Ongoing	Y	.
10.4	Complaints regarding dust to be registered in the complaints register and to be investigated and managed in accordance with the incident reporting procedure.	As required	Y	.
10.5	Dust monitoring to be instituted in case of credible complaints.	As required	Y	.

EMP Number	Technical and Management Commitments	Scheduling	Project Phase	
			Construction	Operation
10.6	Non-essential material handling activities during strong winds will be avoided where practically possible. A decision to stop activities will be at the discretion of the ECO, based on visual observations of dust liberation and the proximity to and impacts on sensitive receptors.	As required	Y	.
10.7	A stakeholder communications plan, including community engagement, to be developed and implemented.	Prior to construction.	Y	.
10.8	The name and contact details of the ECO or PM accountable for air quality and dust issues should be displayed on the site boundary. The head or regional office's contact information should also be displayed.	Ongoing	Y	.
10.9	A dust management plan to be developed and implemented depending on the risk.	Prior to construction.	Y	.
10.10	Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner and record the measures taken.	Ongoing	Y	.
10.11	The complaints log to be made available to the competent authority on request.	As required.	Y	.
10.12	Record any exceptional incidents that cause dust and/or air emissions, either on- or offsite, and the action taken to resolve the situation in the log book or ECO diary.	Ongoing	Y	.
10.13	Undertake on-site and off-site inspections, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log book or ECO diary available to the local authority when requested. This should include regular dust soiling checks of surfaces such as street furniture, cars and window sills within 100 m of site boundary, with cleaning to be provided if necessary.	Daily	Y	.
10.14	Undertake regular site inspections to monitor compliance with the dust management plan, record inspection results and make the log book or ECO diary available to the local authority on request.	Regular, as required.	Y	.
10.15	Increase the frequency of site inspections by the ECO accountable for air quality and dust issues on site should when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.	As required.	Y	.
10.16	Agree dust deposition or real-time PM10 continuous monitoring locations with the Local Authority. Where possible commence baseline monitoring before work commences on site.	Three months prior to construction.	Y	.
10.17	Plan site layout so that machinery and dust causing activities are located away from receptors as far as possible.	Prior to construction.	Y	.
10.18	Erect solid screens or barriers around dusty activities or the site boundaries that are at least as high as any stockpiles on site.	Prior to construction.	Y	.
10.19	Site or specific operations where there is a high potential for dust production and the site is active for an extensive period of time to be fully enclosed.	Prior to construction.	Y	.
10.20	Avoid site runoff of water or mud.	Ongoing	Y	.
10.21	The site fencing, barriers and scaffolding to be cleaned using wet methods.	Ongoing	Y	.

EMP Number	Technical and Management Commitments	Scheduling	Project Phase	
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10.22	Materials that have a potential to produce dust should be removed from site as soon as possible, unless being re-used. If they are being re-used on-site they should be covered, seeded or fenced to prevent wind whipping.	Ongoing	Y	.
10.23	Stockpiles to be covered, seeded or fenced to prevent wind whipping.	Ongoing	Y	.
10.24	All vehicles engines to be switched off engines when stationary - no idling vehicles.	Ongoing	Y	.
10.25	The use of diesel or petrol powered generators to be avoided where practicable. Mains electricity or battery powered equipment to be used instead.	Ongoing	Y	.
10.26	Impose and signpost a maximum-speed-limit of 24 km/h (15 mph) on surfaced and 16 km/h (10 mph) on unsurfaced haul roads and work areas.	Ongoing	Y	.
10.27	Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.	Prior to construction.	Y	.
10.28	Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing).	Prior to construction.	Y	.
10.29	Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.	Ongoing	Y	.
10.30	Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.	Ongoing	Y	.
10.31	Use enclosed chutes and conveyors and covered skips.	Ongoing	Y	.
10.32	Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.	Ongong	Y	.
10.33	Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.	Ongoing	Y	.
10.34	Avoid bonfires and burning of waste materials.	Ongoing	Y	.
10.35	Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable.	Ongoing	Y	.
10.36	Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable.	Ongoing	Y	.
10.37	Only remove the cover in small areas during work and not all at once.	Ongoing	Y	.
10.38	Avoid scabbling (roughening of concrete surfaces) if possible.	Ongoing	Y	.
10.39	Ensure sand and other aggregates are stored in banded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.	Ongoing	Y	.
10.40	Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery.	Ongoing	Y	.

EMP Number	Technical and Management Commitments	Scheduling	Project Phase	
			Construction	Operation
10.41	For smaller supplies of fine power materials ensure bags are sealed after use and stored appropriately to prevent dust.	Ongoing	Y	.
10.42	Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use.	Ongoing	Y	.
10.43	Avoid dry sweeping of large areas.	Ongoing	Y	.
10.44	Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.	Ongoing	Y	.
10.45	Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.	Ongoing	Y	.
10.46	Record all inspections of haul routes and any subsequent action in a site log book.	Ongoing	Y	.
10.47	Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned.	Ongoing	Y	.
10.48	Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).	Ongoing	Y	.
10.49	Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits.	Ongoing	Y	.
10.50	Access gates to be located at least 10 m from receptors where possible.	Ongoing	Y	.
11	BIODIVERSITY - TERRESTRIAL HABITATS	.	.	.
	Environmental Aspect / Impact Source:	.	.	.
	Destruction of natural floral and faunal habitats due to site clearing, earthworks, and movement of vehicles through the veld. Impacts on floral and faunal diversity. Impacts on floral and faunal Species of Conservation Concern (SCC) and protected species.	.	.	.
	Goals and Objectives:	.	.	.
	Prevent the alteration of natural ecological systems and processes. Minimise impacts on protected and SCC species and other areas identified as sensitive. Preserve the floral and faunal diversity.	.	.	.
	Mitigation Measures:	.	.	.
11.1	Trapping, catching and hunting of all animals are prohibited.	Ongoing	Y	Y
11.2	The construction footprint to be clearly demarcated by fencing in order to contain all activities within designated areas.	Prior to construction.	Y	.
11.3	No areas to be cleared outside the development footprint area.	Ongoing	Y	.
11.4	Ensure that development related activities are kept strictly within the development footprint.	Ongoing	Y	Y

EMP Number	Technical and Management Commitments	Scheduling	Project Phase	
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11.5	Ensure that the development footprint area remain as small as possible.	Ongoing	Y	.
11.6	All vehicles to be restricted only to designated roadways in order to limit the ecological footprint of the development activities as well as to reduce the possibility of collisions.	Ongoing	Y	Y
11.7	Care shall be taken to preserve natural vegetation in the immediate vicinity of construction activities, earthmoving and soil stripping, stockpiles, waste facilities, access roads and other infrastructure. The footprint of disturbance must be kept to the minimum required for the activity or infrastructure and reasonable vehicular and equipment movement.	Ongoing	Y	Y
11.8	Damage to and removal of protected trees is prohibited unless licenses for removal are in place (licenses are required where protected tree species cannot be avoided and have to be removed).	Prior to removal of protected trees.	Y	.
11.9	Special authorisation to be applied for and obtained from the DENC in order to cut, disturb, damage or destroy protected and indigenous floral and faunal species.	Prior to site clearing of areas where these plants occur	Y	.
11.10	Sensitive habitats in close proximity to construction, earthmoving and soil stripping activities, stockpiles, waste facilities, access roads and other infrastructure will be clearly demarcated as no-go areas until such time as the risk of damage to these habitats are no longer present.	Ongoing	Y	Y
11.11	Development within the highly sensitive <i>Acacia erioloba</i> woodland habitat unit to be avoided if possible.	Ongoing	Y	.
11.12	The development to be kept within designated areas of low sensitivity and already disturbed areas as far as possible.	Ongoing	Y	Y
11.13	SCC, protected bulb and <i>Aloe</i> species to be rescued and relocated with the assistance of a suitably qualified specialist.	Prior to site clearing of areas where these plants occur	Y	.
11.14	Faunal species found within the development footprint area to be rescued and relocated with the assistance of a suitably qualified specialist.	Prior to construction	Y	.
11.15	The collection of plant materials for firewood or for medicinal purposes are prohibited.	Ongoing	Y	Y
11.16	Traffic calming devices (e.g. speed humps) to be constructed to slow vehicles and help mitigate collision with faunal species.	Ongoing	Y	.
11.17	The edge effects of all construction activities such as erosion and alien plant species proliferation, which may affect floral and faunal habitats in the surrounding area to be managed according to the satisfaction of the ECO.	Ongoing	Y	.
12	ALIEN AND INVASIVE SPECIES	.	.	.
	Environmental Aspect / Impact Source:	.	.	.

EMP Number	Technical and Management Commitments	Scheduling	Project Phase	
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	Disruption of ecological synergy.	.	.	.
	Goals and Objectives:	.	.	.
	Prevent the alteration of natural ecological systems and processes.	.	.	.
	Mitigation Measures:	.	.	.
12.1	Alien and invasive species shall not be allowed to establish within the areas affected by construction or operation.	Ongoing	Y	Y
12.2	Imported materials shall be free of alien species, weeds and seeds of alien or invasive species.	Ongoing	Y	Y
12.3	Sources of imported soil and construction aggregates shall be listed and pre-approved by the ECO.	Ongoing	Y	.
12.4	All imported materials, from sources that have not been pre-approved by the ECO, shall be inspected by the ECO before brought to site.	As required	Y	.
12.5	Strategies to control the spread of alien and invasive species will be developed and implemented based on the specific species and scale of the infestation.	As required	Y	Y
12.6	Alien species encountered within the development footprint to be removed in order to comply with existing legislation (amendments to the regulations under the CARA, 1983 and Section 28 of the NEMA, 1998). Species specific and area specific eradication recommendations include:	Ongoing	Y	Y
12.7	Take care with the choice of herbicide to ensure that no additional impact and loss of indigenous plant species occurs due to the herbicide used, with special mention of areas in close proximity to SCC.	Ongoing	Y	Y
12.8	The footprint areas to be kept as small as possible when removing alien plant species.	Ongoing	Y	Y
12.9	The abundance of <i>Acacia mellifera</i> to be monitored in order to identify the possibility of encroachment and if necessary the implementation of appropriate management measures to avoid loss of natural species diversity.	Ongoing	Y	Y
13	FIRES	.	.	.
	Environmental Aspect / Impact Source:	.	.	.
	Fire damage to natural habitats, adjacent property and buildings.	.	.	.
	Goals and Objectives:	.	.	.
	Preserve natural habitats. Protect adjacent property.	.	.	.
	Mitigation Measures:	.	.	.
13.1	Informal fires are prohibited in the vicinity of the site.	Ongoing	Y	Y
13.2	Open fires for heating and cooking not to be allowed near areas where there is a risk of starting a veld fire.	Ongoing	Y	Y

EMP Number	Technical and Management Commitments	Scheduling	Project Phase	
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13.3	Adequate fire-fighting equipment to be available at all times and to be inspected and maintained as per supplier specifications, particularly in areas prone to fires or in areas where flammable substances are being stored and handled, and during winter months.	Ongoing	Y	Y
13.4	Use of potential ignition sources, such as welding and grinding, in areas where there is a risk of explosions or risk of starting a veld fire will be under supervision and appropriate fire fighting equipment will be provided.	Ongoing	Y	Y
13.5	Smoking to be prohibited in the vicinity of flammable substances and appropriate no-smoking signs will be provided. Such areas include the workshop and fuel storage areas and any areas where the vegetation or other material is such as to make liable the rapid spread of an initial flame.	Ongoing	Y	Y
13.6	Fire breaks will be provided around areas where explosives are stored.	As required	Y	Y
13.7	A trained fire response team will be in place to control fires as and when required.	Ongoing	Y	.
13.8	Investigate the need for fire breaks and controlled burning and implement appropriate actions.	Ongoing	Y	.
13.9	Regular and appropriate maintenance of footprint area.	Ongoing	.	Y
13.10	Any fires to be reported to the fire response team or relevant authority immediately.	As required	Y	Y
13.11	The fire response team to advise the relevant authority of a fire immediately and not to wait until it can no longer be controlled.	During construction	Y	Y
14	MACHINERY, EQUIPMENT, VEHICLE MOVEMENT AND ROADS	.	.	.
	Environmental Aspect / Impact Source:	.	.	.
	Noise, dust, vibrations and other nuisances due to presence and use of machinery, equipment and vehicles. Public safety risks.	.	.	.
	Goals and Objectives:	.	.	.
	Minimise disturbances and public safety risks during construction and operation and use of machinery, equipment and vehicles.	.	.	.
	Mitigation Measures:	.	.	.
14.1	Maintain machinery, vehicles and equipment in good condition to prevent unnecessary noise output, emissions, and risks of hydrocarbon spills (fuels and lubricants).	Ongoing	Y	.
14.2	All vehicles utilising public roads should be roadworthy, and should thus meet applicable maximum noise output requirements. Records will be kept on file.	Ongoing	Y	Y
14.3	Vehicles accessing the Kathu Supplier Park to provide evidence of regular servicing.	Ongoing	.	Y
14.4	All vehicles to adhere to prescribed speed limits as indicated on road signage and/or specific instructions or procedures issued by the PM or ECO.	Ongoing	Y	.

EMP Number	Technical and Management Commitments	Scheduling	Project Phase	
			Construction	Operation
14.5	During dry windy conditions, the ECO will conduct visual observations of dust generation on gravel roads and will direct the movement of water tankers based on these visual observations.	As required	Y	.
14.6	Vehicles to remain on existing roads and tracks and will not be permitted to drive off-road and in the veld, unless strictly necessitated by an emergency situation or with the approval of the ECO.	Ongoing	Y	.
14.7	No new roads and tracks will be created, unless approved by the ECO.	Ongoing	Y	.
14.8	Traffic and movement over stabilised / rehabilitated areas will be appropriately restricted to avoid compromising erosion control measures and damage to topsoil or vegetation cover.	Ongoing	Y	Y
14.9	Develop a construction traffic management plan.	At start of construction, as required thereafter	Y	.
14.10	Minimise movement of construction traffic along public roads as far as reasonably possible.	Ongoing	Y	.
14.11	Maintenance of road sections and intersections affected by construction to be kept in an acceptable condition.	Ongoing	Y	.
14.12	All internal roads to be kept clean and free from potholes, ruts or bumps in order to avoid excessive rattle and/or body-slap.	Ongoing	Y	Y
14.13	Use of circular routes to reduce necessity for reversing.	Ongoing	Y	.
14.14	Internal roads and delivery vehicle routes to be routed away from noise-sensitive locations.	Ongoing	Y	Y
14.15	Internal roads and delivery vehicle routes to be screened from nearby noise-sensitive locations by intervening topography where possible.	Ongoing	.	Y
14.16	Broadband reverse warning systems to be used on vehicles.	As required, ongoing.	Y	Y
14.17	At intersection M2 (R380 and Hendrik van Eck Street) a short lane of at least 50 m to be implemented on the western approach in combination with the changed lane markings on the northern approach .	Prior to operation.	Y	Y
14.18	At intersection M4 (R380 and Frikkie Meyer):	Prior to operation.	Y	Y
14.18.1	Access to the Kathu Supplier Park to be provided to the south of this intersection.	Prior to operation.	Y	Y
14.18.2	Intersection to be signalised to incorporate traffic signal control for pedestrians from the Dingleton Relocation Project and other residential areas of Kathu.	Prior to operation.	Y	Y
14.18.3	An additional short right-turn lane to be provided from the east.	Prior to construction	Y	Y
14.19	At intersection M5 (R380 and N14) a short right-turn lane from the west to be provided.	Prior to operation.	Y	Y
14.20	A public transport stop to be provided on either side of the R380 downstream of the intersection with Frikkie Meyer Street (future Kathu Supplier Park access) for use by mini-bus taxis.	Prior to operation.	Y	Y

EMP Number	Technical and Management Commitments	Scheduling	Project Phase	
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14.21	Liaison with the Provincial Roads Department in conjunction with all relevant stakeholders, including the South African National Roads Authority Limited (SANRAL), to ensure cohesion to clarify matters in terms of the following required road upgrades in Kathu:	Prior to operation.	Y	Y
14.21.1	Upgrades required at intersection M4: Right-turn lane upgrades from the north, south and west approaches, and left-turn lane upgrade from the eastern approach.	Prior to operation.	Y	Y
14.21.2	The signalisation of intersection M5 to incorporate traffic signal control for pedestrians to/from Bestwood Estate (responsibility of the Bestwood Estate development).	Prior to operation.	Y	Y
14.21.3	The edge break on the R380 to be remedied (combined responsibility of the responsible road authority and the major heavy vehicle traffic contributors, such as Sishen Iron Ore Mine and the proposed Kathu Supplier Park).	Prior to operation.	Y	Y
14.22	Workforce to be encouraged to live in established residential areas. Provide transport from these areas to the Kathu Supplier Park.	Ongoing	Y	Y
15	NOISE			
	Environmental Aspect / Impact Source:			
	General construction activities in close proximity to residences. Movement of vehicles and equipment. Materials handling. Use of machinery and equipment. Traffic.			
	Goals and Objectives:			
	Develop and implement appropriate noise control measures according to risk profile of construction site and proximity of residences.			
	Mitigation Measures:			
15.1	Noise levels and other disturbances in close proximity to residences to be kept to a minimum and to daylight hours.	Ongoing	Y	
15.2	Complaints regarding noise to be registered in the complaints register and to be investigated and managed in accordance with the incident reporting procedure.	As required	Y	
15.3	Noise monitoring to be instituted in case of credible complaints.	As required	Y	
15.4	Localised screens, perimeter screening mounds, etc., to provide attenuation where necessary to be used.	Ongoing	Y	

EMP Number	Technical and Management Commitments	Scheduling	Project Phase	
			Construction	Operation
15.5	Generators/compressors to be installed away from noise-sensitive receptors/ locations, preferably within purpose built acoustic enclosures.	As required, ongoing	Y	Y
15.6	Storage areas to be located away from noise-sensitive receptors.	Ongoing	Y	
15.7	Site induction programme and site rules to include details of good working practices to minimise noise emissions from plant. Information sheet for contractors to outline the requirement for good site practices and good neighbour practice.	As required, ongoing	Y	
15.8	The Kathu Supplier Park to be maintained in a good state of repair at all times. Noise suppression measures must be applied to all maintenance equipment.	As required, ongoing.		Y
15.9	Noise emissions from site operations must be kept to a minimum and remain within acceptable limits. All noise generated must adhere to SANS10103:2008 Edition 6 guidance for maximum allowable noise levels in residential areas.	Ongoing		Y
15.10	No pure tone sirens or hooters to be used except in emergencies.	Ongoing		Y
15.11	Noisy operations to be scheduled to occur at the same time to reduce the longevity of any potential disturbance.	Ongoing		Y
15.12	Site staff and labourers to be discouraged from loitering in areas close to noise-sensitive receptors.	Ongoing		Y
15.13	Implementation of a noise monitoring scheme.	Ongoing		Y
16	INCIDENT REPORTING AND MANAGEMENT	.	.	.
	Environmental Aspect / Impact Source:	.	.	.
	Hazardous spills, pollution occurrences, excessive dust or other forms of environmental damage. Recurring environmental incidents. Complaints by third parties.	.	.	.
	Goals and Objectives:	.	.	.
	Adequately assess root cause of incidents in order to develop and implement appropriate corrective actions and prevent incidents from recurring.	.	.	.
	Mitigation Measures:	.	.	.
16.1	An incident reporting procedure to be put in place and kept up to date.	At start of construction phase, ongoing thereafter.	Y	.
16.2	Environmental incidents (including complaints by third parties) to be reported in writing as per the incident reporting procedure.	As soon as possible, but at least within 48 hours.	Y	.

EMP Number	Technical and Management Commitments	Scheduling	Project Phase	
			Construction	Operation
16.3	Emergency incidents to be reported as soon as possible and in person to the ECO and PM, but should be reported in writing as per the incident reporting procedure thereafter.	As soon as possible, but at least within 12 hours.	Y	.
16.4	Register environmental incidents, and ensure investigation, follow-up and close out of all incidents.	As required	Y	.
16.5	All incidents to be investigated and appropriate corrective actions to be implemented, including measures to prevent recurring incidents.	As required	Y	.
16.6	Report a major incident (where the incident constitutes a breach of permit or licence condition) to the controlling authority.	Within 48 hours	Y	.
16.7	Upon completion of construction, an operational phase incidents report register and procedure to be put in place and kept up to date at all times.	At end of construction phase, ongoing thereafter.	.	Y
17	WASTE MANAGEMENT	.	.	.
	Environmental Aspect / Impact Source:	.	.	.
	Pollution or health impacts caused by inappropriate waste management practices.	.	.	.
	Goals and Objectives:	.	.	.
	Manage all waste types through the use of the waste minimisation hierarchy:	.	.	.
	1. Waste Avoidance and Reduction of the generation of waste.	.	.	.
	2. Recovery, Re-use and Recycling of the amount of waste generated.	.	.	.
	3. Treatment and Processing of waste; where applicable.	.	.	.
	4. If waste does not apply to the abovementioned, disposal (as a last resort) applies, using licensed contractors, transporters and disposal facilities which are permitted to handle and test the various waste streams.	.	.	.
	Define and implement control measures to prevent inappropriate storage, treatment and disposal of waste.	.	.	.
	Implement appropriate waste management procedures for all waste streams.	.	.	.
	Prevent pollution or health impacts caused by inappropriate waste management practices.	.	.	.
	Mitigation Measures:	.	.	.
17.1	A waste management procedure to be put in place and kept up to date as per the specific requirements of the construction and operation phases.	At start of construction, as required thereafter.	Y	Y

EMP Number	Technical and Management Commitments	Scheduling	Project Phase	
			Construction	Operation
17.2	The waste management procedure to cover collection, transport and disposal of waste. The procedure will address the following waste management principles:	Ongoing	Y	Y
17.2.1	Identify waste streams generated and document the selected methods for handling, treatment and off-site disposal.	As required	Y	Y
17.2.2	Ensure appropriate location and design of waste handling, storage and treatment facilities.	As required	Y	Y
17.2.3	Provide designated waste collection points and ensure that these have adequate capacity and that they are serviced frequently.	As required	Y	Y
17.2.4	Ensure appropriate temporary storage of waste earmarked for off-site disposal.	As required	Y	Y
17.2.5	Ensure appropriate off-site disposal at a waste disposal facility in order to minimise the risk of soil, water and air pollution.	As required	Y	Y
17.2.6	Maintain records of the type and volume of waste leaving the construction site and balance with records of the type and volume of off-sited disposal at waste facilities.	As required	Y	Y
17.2.7	Ensure appropriate management of specific hazardous wastes such as waste oil, rejected hazardous substances, filters, batteries, chemical toilet contents, etc.	As required	Y	Y
17.2.8	Control of litter on an ongoing basis.	As required	Y	Y
17.2.9	Ensure regular inspections of waste handling, storage and treatment facilities.	As required	Y	Y
17.3	All waste generated on site to be disposed of in a suitable manner to not cause any surface water pollution or health hazard.	Ongoing	Y	Y
17.4	No littering by construction workers to be allowed. During the construction period, the facilities to be maintained in a neat and tidy condition and the site and surroundings to be kept free of litter.	Ongoing	Y	.
17.5	Measures to be taken to reduce the potential for litter and negligent behaviour with regard to the disposal of all refuse. The Contractor to provide litter collection facilities for later safe disposal at approved sites.	Ongoing	Y	.
17.6	The burning and burying of waste at or on site is strictly prohibited.	Ongoing	Y	Y
17.7	Waste to be stored in an appointed area in covered, tip proof metal drums/ skips for collection and disposal.	Ongoing	Y	Y
17.8	Ensure that the quantities of general waste management activities (storage, handling and recycling) on site falls below the legislated thresholds of the National Environmental Management Act, 2008 (NEM:WA, No 59 of 2008). Exceedance of these thresholds to be approved as part of a waste management license.	Ongoing	Y	Y
17.9	Recycling and the provision of separate waste receptacles for different types of waste to be encouraged.	Ongoing	Y	Y
17.10	A refuse control system to be established for the collection and removal of refuse to the satisfaction of the ECO.	Ongoing	Y	.
17.11	Waste to be disposed of at registered landfill sites. There is no disposal of general or hazardous waste to land within the Kathu Supplier Park footprint unless approved as part of a waste management license.	Ongoing	Y	Y

EMP Number	Technical and Management Commitments	Scheduling	Project Phase	
			Construction	Operation
17.12	All hazardous waste (e.g. bitumen, tar, oils etc.) will only be taken to a permitted hazardous waste disposal site.	As required	Y	.
17.13	Safe disposal certificates from a permitted waste disposal site to be kept on hand.	Ongoing	Y	Y
17.14	Upon completion of construction, an operational phase waste management procedure to be put in place and kept up to date at all times.	Ongoing	.	Y
17.15	Dumping of refuse are not to be allowed within the surrounding environment.	Ongoing	Y	Y
18	SPILL PREVENTION, RESPONSE AND CLEAN-UP	.	.	.
	Environmental Aspect / Impact Source:	.	.	.
	Substances such as fuels, lubrication oils, hydraulic and brake fluid, solvents, radioactive components, paints and anti-corrosives, insecticides and pesticides, as well as the by-products and waste associated with use of these products will be present on site. The release of these hazardous substances into the receiving environment that could result in air, soil and water pollution and may affect the health and well being of people, plants and animals.	.	.	.
	Goals and Objectives:	.	.	.
	Define and implement control measures for hazardous spill prevention, and ensure adequate response and clean-up measures are put in place.	.	.	.
	Mitigation Measures:	.	.	.
18.1	A spill prevention and response procedure to be put in place and kept up to date as per the specific requirements of construction and operation and will be based on the following principles:	Ongoing	Y	Y
18.1.1	Identify activities and areas where there are risks for spills.	Annually	Y	Y
18.1.2	Provision of workshops and wash bays equipped with appropriate stormwater management to separate clean and dirty water, and impervious surfaces draining towards silt traps and oil separators.	Ongoing	Y	Y
18.1.3	Prevention of spills during the transportation and handling of hazardous chemicals.	Ongoing	Y	Y
18.1.4	Ensure appropriate maintenance of vehicles and equipment to prevent spills. Records to be kept on file.	Ongoing	Y	Y
18.1.5	Drip trays are to be placed under stationary vehicles and equipment which leak oil or lubricants.	Ongoing	Y	Y
18.1.6	Identify and train people responsible to respond to spills and to provide assistance and instructions for immediate actions required to stop the spill, prevent further spreading of the hazardous substance and to obtain specialist input where required.	Ongoing	Y	Y
18.1.7	Ensure appropriate inspections are conducted to ensure early detection of spills.	Ongoing	Y	Y

EMP Number	Technical and Management Commitments	Scheduling	Project Phase	
			Construction	Operation
18.1.8	Investigate and assess spills, as per the incident reporting procedure, and identify and implement immediate appropriate corrective actions required to stop the spill and prevent further spreading of the hazardous substance.	Ongoing	Y	Y
18.1.9	Determine appropriate measures to remove, treat and/or dispose of the hazardous substance and contaminated soil and/or water.	Ongoing	Y	Y
18.1.10	Determine appropriate measures to clean up the area affected by the spill, with specialist input where required.	Ongoing	Y	Y
18.2	The ECO and EA to investigate and implement appropriate measures to collect, handle, store and treat contaminated soil. The aim of treatment is to contain contaminants and rehabilitate soils for later use in rehabilitation.	Ongoing	Y	.
18.3	Contractor responsible to collect, handle, store and treat contaminated soil as per procedures developed by the ECO and EA.	As required	Y	.
18.4	All vehicles to be serviced on a regular basis and in well-constructed and bunded areas, with oil separators and dirty water collection systems.	Ongoing	Y	Y
18.5	In the event of a breakdown, maintenance of vehicles to take place with care and the recollection of spillage to be practiced to prevent the ingress of hydrocarbons into the topsoil.	Ongoing	Y	Y
18.6	Special care to be taken to avoid spillage of hazardous products to avoid water-soluble contaminants from entering the ground or contaminating surface and/ or groundwater.	Ongoing	Y	Y
18.7	Any spillage of hazardous products to be attended to immediately and affected areas to be promptly reinstated to the satisfaction of the ECO.	Ongoing	Y	.
18.8	If soil is polluted, the first management priority should be to treat the pollution by means of in situ bioremediation. The acceptability of this option must be verified by an appropriate soils expert and by the local water authority on a case by case basis, before it is implemented.	Ongoing	Y	Y
18.9	If in situ soil treatment (bio-remediation) is not possible or acceptable then the polluted soil to be classified according to the Minimum Requirements for the Handling, Classification and Disposal of Hazardous Waste (DW&S) and disposed at an appropriate, permitted, off-site waste facility.	Ongoing	Y	Y
19	HAZARDOUS SUBSTANCES STORAGE AND HANDLING	.	.	.
	Environmental Aspect / Impact Source:	.	.	.

EMP Number	Technical and Management Commitments	Scheduling	Project Phase	
			Construction	Operation
	Substances such as fuels, lubrication oils, hydraulic and brake fluid, solvents, paints and anti-corrosives, insecticides and pesticides, as well as the by-products and waste associated with use of these products will be present on the site. The release of these hazardous substances into the receiving environment could result in air, soil and water pollution and may affect the health and well being of people, plants and animals.			
	Goals and Objectives:			
	Ensure appropriate storage and handling of hazardous substances to prevent pollution and health risks.			
	Mitigation Measures:			
19.1	A hazardous substance management procedure to be put in place and kept up to date as per the specific requirements of construction, and will be based on the Sishen Mine environmental management system (EMS) procedures and the following principles:	At start of construction, as required thereafter	Y	Y
19.1.1	Ensure appropriate location and design of hazardous storage areas.	Ongoing	Y	Y
19.1.2	Ensure appropriate bunding for fuel and oil storage areas and storage areas for other hazardous substances. The design of the bunds will be based on the volume and nature of substances stored, the risk of spillages, applicable legislation and Kumba's corporate policies. Bunds will be provided with valves for controlled release of rainwater.	Annually	Y	Y
19.1.3	Prevent the integrity and capacity of the bunded areas being compromised by rainwater and stormwater ingress.	Ongoing	Y	Y
19.1.4	Prevent contamination of stormwater.	Ongoing	Y	Y
19.1.5	Prevent contamination of soil and down stream water courses.	Ongoing	Y	Y
19.1.6	Ensure that appropriate containers are used for storage and transport of hazardous substances and that all containers are adequately marked for easy identification.	Ongoing	Y	Y
19.1.7	Ensure that the necessary approvals are in place for storage of controlled substances.	Ongoing	Y	Y
19.1.8	Ensure adequate signage at hazardous storage areas. Fenced controlled.	Ongoing	Y	Y
19.1.9	Maintain an inventory of all hazardous substances, with details about emergency response in case of spillage or personnel exposure.	Ongoing	Y	Y
19.1.10	Control access to hazardous storage areas.	Ongoing	Y	Y
19.1.11	Train personnel dealing with activities and areas where hazardous substances are stored and handled.	Ongoing	Y	Y
19.1.12	Identify people responsible to respond to emergencies.	Ongoing	Y	Y
19.1.13	Control transport and delivery of hazardous substances.	Ongoing	Y	Y

EMP Number	Technical and Management Commitments	Scheduling	Project Phase	
			Construction	Operation
19.1.14	Manage dedicated areas used for washing, maintenance and repair of vehicles and equipment that are effectively placed, designed and maintained in good working order.	Ongoing	Y	Y
19.1.15	Ensure regular inspections of all areas where hazardous substances are stored or handled.	Ongoing	Y	Y
19.2	A register of all chemicals to be used on site, along with details of quantities and Material Safety & Data Sheets must be compiled and kept up to date.	Ongoing	Y	Y
19.3	Under no circumstances will the spoiling or burying of hazardous products be allowed. Unused or rejected hazardous products will be returned to the supplier's production plant.	Ongoing	Y	Y
19.4	All the necessary handling and safety equipment required for the safe use of hazardous substances shall be provided by the Contractor to, and used or worn by, the staff whose duty it is to manage and maintain the Contractor's and their subcontractor's and supplier's plant, machinery and equipment.	Ongoing	Y	Y
19.5	Staff dealing with these materials / substances to be aware of their potential impacts and follow the appropriate safety measures.	Ongoing	Y	Y
19.6	Ensure that the quantities of hazardous waste management activities (storage, handling and recycling) on site falls below the legislated thresholds of the NEM:WA. Exceedance of these thresholds to be approved as part of a waste management license.	Ongoing	Y	Y
19.7	If hazardous materials are to be stored on site, an area must be provided within the construction camp, away from any existing structures.	As required.	Y	Y
19.8	Hazardous substances to be stored under controlled conditions, in a secured, appointed area that is fenced and has restricted entry.	As required.	Y	Y
19.9	The storage facility to have a concrete floor that is bunded with an impermeable liner to prevent groundwater pollution. An emergency response procedure must be drawn up to manage any event of misuse or spillage that will negatively affect an individual or the environment.	Ongoing	Y	Y
19.10	Fire prevention facilities must be present at the hazardous storage facility.	Ongoing	Y	Y
19.11	Hazardous waste signs indicating the nature of the stored materials to be displayed on the storage facility or containment structure.	Ongoing	Y	Y
20	AESTHETICS, HOUSEKEEPING AND VISUAL IMPACTS	.	.	.
	Environmental Aspect / Impact Source:	.	.	.
	Alteration of the visual and landscape character of the immediate surroundings.	.	.	.
	Goals and Objectives:	.	.	.
	Maintain the visual quality and appeal of construction site and surroundings.	.	.	.

EMP Number	Technical and Management Commitments	Scheduling	Project Phase	
			Construction	Operation
	Mitigation Measures:	.	.	.
20.1	Pay attention to the appearance of buildings and structures, especially temporary structures and construction areas that are visible from public roads and viewpoints outside the construction area.	Ongoing	Y	.
20.2	Pay attention to lighting design and direction, especially in areas visible from public roads and viewpoints outside the Kathu Supplier Park area. Avoid light impacts on areas beyond the boundary of the supplier park.	Ongoing	Y	Y
20.3	Ensure good housekeeping and control litter and general site cleanliness.	Ongoing	Y	Y
21	REHABILITATION	.	.	.
	Environmental Aspect / Impact Source:	.	.	.
	Long-term environmental degradation due to incomplete site clean-up and rehabilitation.	.	.	.
	Goals and Objectives:	.	.	.
	Minimise residual impacts and ensure physical and chemical stability of site. Ensure human safety.	.	.	.
	Mitigation Measures:	.	.	.
21.1	Identify disturbed areas for rehabilitation (all areas disturbed during construction and areas where previous rehabilitation measures have failed or are incomplete).	Monthly, and at end of construction phase	Y	.
21.2	Any natural areas beyond the development footprint which have been affected by the development activities to be rehabilitated using indigenous grass species.	Prior to operation	Y	.
21.3	Develop rehabilitation procedures specific to each disturbed area.	Monthly, and at end of construction phase	Y	.
21.4	Disturbed areas, especially cut and fill embankments, should be rehabilitated as soon as possible.	As required	Y	.
21.5	Growth medium (i.e. topsoil) will be placed on all disturbed areas (minimum layer of 300 mm).	As required	Y	.
21.6	Soils to be replaced to all areas not required by the operational phase, and the preparation of a seed bed and/or rock cladding to facilitate the re-vegetation program for these areas should be conducted to limit potential erodibility as well as maintaining the source materials for rehabilitation processes.	Ongoing	Y	.
21.7	Soil to be replaced to appropriate soil depths, and areas to be covered to achieve a free draining landscape, as close as possible to the pre-development/ baseline land capability rating.	Prior to operation	Y	.

EMP Number	Technical and Management Commitments	Scheduling	Project Phase	
			Construction	Operation
21.8	A representative sampling of the stripped soils to be analysed to determine the nutrient status of the utilisable materials. As a minimum the following elements should be tested for: electrical conductivity, cation exchange capacity, pH, Calcium, Magnesium, Potassium, Sodium, Phosphor, Zinc, Clay% and Organic Carbon. These elements provide the basis for determining the fertility of soil based on the analysis, fertilisers that will be applied if necessary.	Prior to operation	Y	.
21.9	Naturally occurring indigenous species will be used in the re-vegetation of disturbed areas to help with the prevention of alien invasive species becoming dominant and with maintaining biodiversity.	As required	Y	.
21.10	As many individuals of <i>Acacia erioloba</i> to be included in the landscaping plan as possible.	Prior to operation	Y	.
21.11	Rehabilitation of disturbed area will include reasonable efforts to re-establish protected plant species removed prior to site clearing.	As required	Y	.
21.12	The wetland pan is to be cleared of the existing illegally dumped waste and alien invasive species under the supervision of the ECO.	Prior to operation	Y	.
21.13	All gravel and other material to be stripped from places to form terraces and use as construction material and/ or to fill cuttings/ voids.	Prior to operation	Y	.
21.14	Foundations to be removed to a maximum depth of 1 m.	Prior to operation	Y	.
21.15	All waste, with special mention of waste rock, spoils and remaining building material to be removed from the site on completion of the construction phase.	Prior to operation	Y	.
22	PUBLIC AND LABOUR RELATIONS	.	.	.
	Environmental Aspect / Impact Source:	.	.	.
	Negative public perception. Community mobilisation and expectations regarding potential benefits not met. Job creation during construction. Construction impact on local economy.	.	.	.
	Goals and Objectives:	.	.	.

EMP Number	Technical and Management Commitments	Scheduling	Project Phase	
			Construction	Operation
	Maintain transparent communication with project affected community. Maintain community based "license to operate". Create as much as possible local procurement and development. To empower local businesses where possible and create opportunities for growth. Avoid as far as possible impacts to the public and local community in the above mentioned aspects and provide measures to minimise these impacts.			
	Mitigation Measures:			
22.1	Key stakeholders should be adequately liased with to clarify roles.	Prior to construction.	.	.
22.2	A communication strategy to be compiled for the Kathu Supplier Park to address potential public confusion and stakeholder fatigue .	Prior to construction	.	.
22.3	SIOC and Contractors will maintain transparent employment policies and will, wherever reasonably possible, give preference to labour from local communities.	Ongoing, as required.	Y	.
22.4	A recruitment policy to be developed that promotes equal opportunity to all people (woman, disabled) and gives preference to local labour. Communicate the policy and requirements to the affected communities through the media, community leadership and a community liaison forum. Establish a labour desk in Kathu.			
22.5	A recruitment strategy to be developed for the Kathu Supplier Park with the buy-in of the tenants.	Prior to operation.	.	Y
22.6	The recruitment strategy to be communicated to the key stakeholders.	Ongoing	.	Y
22.7	An easily accessible recruitment desk to be established dealing specifically with the Kathu Supplier Park (can be done in partnership with the Gamagara Local Municipality (GLM), Gamagara Youth Development Advisory Centre (GYDAC) and GamaGara Development Forum(GDF)).	Ongoing, as required.	Y	Y
22.8	Specific recruitment times, dates and the recruitment policy to be advertised in the local media and on local radio stations.	Ongoing, as required.	Y	Y
22.9	Quotas for local employment to be set and to be ensured that these are written into the specifications for contractors and tenants.	Ongoing, as required.	Y	Y
22.10	Training and skills development criteria to be included in the specifications – skills development to focus on transferable skills that can be utilised in a number of industries. Liaise with the GLM, regional Mining Qulifications Authority (MQA) and GDF about possible synergies between projects.	Ongoing, as required.	Y	Y

EMP Number	Technical and Management Commitments	Scheduling	Project Phase	
			Construction	Operation
22.11	Indirect employment opportunities to be encouraged and investigated (via Northern Cape Chamber of Commerce and Industry (NOCCI), GYDAC or GDF).	Ongoing, as required.	Y	Y
22.12	Labour-intensive construction methods to be used wherever reasonably possible.	Ongoing, as required.	Y	.
22.13	Local goods and services to be procured wherever reasonably possible.	Ongoing, as required.	Y	.
22.14	Supply chain opportunities to be communicated through the Project's website and communications materials.	Ongoing, as required.	Y	.
22.15	Quotas for local procurement to be set in the specification for contractors.	Ongoing, as required.	Y	.
22.16	Local sub-contractors to be used wherever reasonably possible.	Ongoing, as required.	Y	.
22.17	Liaise with GLM, GDF and regional MOA about skills development and SME development initiatives that are currently taking place.	Ongoing, as required.	Y	.
22.18	A partnership to be formed with a local non-government organisation, other industries and the GLM to address social pathologies in the local communities. There may be existing programmes that can be joined.	Ongoing, as required.	Y	.
22.19	Ensure contractors have an employee wellness programme. Ensure contractors supply proper housing to their employees and not allow them to use informal housing (it is reported that many of the people living in the informal settlement work for contractors).	Ongoing, as required.	Y	.
22.20	The proponent to engage with the GLM about the availability of infrastructure, if there are a significant number of people that cannot be recruited locally due to the specialist nature of the job.	Ongoing, as required.	Y	.
22.21	Appropriate measures to be included in the lease agreements of the tenants for the restriction of noise and dust.	Ongoing	.	Y
23	BLASTING AND VIBRATIONS		.	.
	Environmental Aspect / Impact Source:		.	.
	Structural damage and nuisance factors. Damage to structures and third party property.	.	.	.
	Goals and Objectives:	.	.	.

EMP Number	Technical and Management Commitments	Scheduling	Project Phase	
			Construction	Operation
	Develop and implement appropriate blasting control measures.	.	.	.
	Mitigation Measures:	.	.	.
23.1	A qualified and registered blaster will supervise all blasting and rock splitting operations.	Ongoing	Y	.
23.2	A 500 meter safety zone around the perimeter of blasting will be maintained and evacuated during blasting, unless approval for relaxation of the 500 safety zone has been obtained.	Ongoing	Y	.
23.3	Adequate warning will be provided immediately prior to blasting.	Ongoing	Y	.
23.4	The ECO will register complaints about blasting damage as per the complaints procedure.	As required	Y	.
23.5	The ECO will register environmental damage caused by blasting as per the incident reporting procedure.	As required	Y	.
23.6	Environmental damage caused by construction-related vibration, fly rock or air blast will be repaired.	As required	Y	.
23.7	Vibration monitoring will be instituted in the case of credible complaints about damage to property.	As required	Y	.
23.8	If the vibration monitoring confirms that damage to property was caused by construction related blasting, damage will be repaired or appropriate compensation will be made.	As required	Y	.
23.9	Blasting will be limited to daylight hours.	Ongoing	Y	.
23.10	People in the vicinity of the blast zone will be notified if blasting is to happen at night.	As required	Y	.
24	ABLUTION FACILITIES AND SEWAGE TREATMENT	.	.	.
	Environmental Aspect / Impact Source:	.	.	.
	Spread of biological contamination into the receiving environment. Health risks due to unhygienic conditions.	.	.	.
	Goals and Objectives:	.	.	.
	Define and implement control measures to ensure adequate treatment and disposal of sewage waste.	.	.	.
	Mitigation Measures:	.	.	.
24.1	All sewerage water from the camp / offices shall be disposed of into the municipal connection, if available. If immediate connection to the existing sewage line is not possible, chemical toilets must be provided for workers.	Prior to construction	Y	Y
24.2	Adequate toilet facilities shall be provided on site, approximately one toilet per 15 staff members.	Ongoing	Y	Y
24.3	The positioning of the chemical toilets shall be done in consultation with the ECO.	Ongoing	Y	.
24.4	Toilets will be easily accessible and will be provided within easy walking distance from where employees are working.	Ongoing	Y	.
24.5	Toilets will be maintained to ensure hygienic conditions and will be provided with locks and doors.	Ongoing	Y	Y
24.6	Chemical toilets will be secured to prevent them from blowing over.	Ongoing	Y	.

EMP Number	Technical and Management Commitments	Scheduling	Project Phase	
			Construction	Operation
24.7	Chemical toilets will not be placed in areas susceptible to flooding.	Ongoing	Y	.
24.8	The waste material generated from the chemical toilet facilities shall be serviced on a regular basis.	Ongoing, as required.	Y	.
24.9	Disposal of chemical toilet waste to be in accordance with the waste management procedure to be issued by the ECO.	Ongoing	Y	.
24.10	Use of open areas for this purpose shall not, under any circumstances, be allowed.	Ongoing	Y	Y
24.11	The construction of "long drop" toilets is forbidden.	Ongoing	Y	Y
25	ENERGY CONSUMPTION AND GREENHOUSE GAS EMISSIONS	.	.	.
	Environmental Aspect / Impact Source:	.	.	.
	Depletion of natural energy resources.	.	.	.
	Contribution to climate change.	.	.	.
	Electricity use.	.	.	.
	Fuel use.	.	.	.
	Removal of vegetation (loss of carbon sequestered in vegetation cover.	.	.	.
	Goals and Objectives:	.	.	.
	Optimisation of natural resource consumption and conservation.	.	.	.
	Minimise energy consumption, create awareness and encourage all staff to use energy sparingly.	.	.	.
	Reduce carbon emissions.	.	.	.
	Minimise vegetation removal.	.	.	.
	Maximise carbon sequestration through appropriate rehabilitation practices.	.	.	.
	Mitigation Measures:	.	.	.
25.1	Pay particular attention to energy and carbon reduction measures as part of project design.	Design	Y	Y
26	WATERCOURSES AND WETLANDS	.	.	.
	Environmental Aspect / Impact Source:	.	.	.
	Loss of wetland habitat and ecological structure.	.	.	.
	Changes to ecological and socio-cultural service provision.	.	.	.
	Impacts on wetland hydrological function and sediment balance.	.	.	.
	Goals and Objectives:	.	.	.

EMP Number	Technical and Management Commitments	Scheduling	Project Phase	
			Construction	Operation
	Improved ecological and socio-cultural service provision of the wetland habitats. Conservation of wetland hydrological functions as an integrated and wholistic approach to conserve the surrounding environment.			
	Mitigation Measures:			
26.1	The wetland habitat to be strictly off limit to construction personnel and vehicles.	Ongoing	Y	Y
26.2	Ensure that construction related activities do not encroach into the wetlands or wetland buffer zones.	Ongoing	Y	.
26.3	Limit the footprint area of the construction activity to what is absolutely essential in order to minimise environmental damage.	Ongoing	Y	.
26.4	The boundaries of footprint areas are to be clearly defined and it should be ensured that all activities remain within defined footprint areas.	Ongoing	Y	Y
26.5	Edge effects of activities including erosion and alien/ weed control need to be strictly managed in wetland areas.	Ongoing	Y	Y
26.6	Remove all alien and weed species encountered in order to comply with existing legislation (amendments to the regulations under the Conservation of Agricultural Resources Act, 1983 and Section 28 of the National Environmental Management Act, 1998). However, care should be taken with the use of herbicides within areas close to the wetland feature to ensure no additional impacts occur due to the herbicide used.	Ongoing	Y	Y
26.7	Restrict construction vehicles to designated roadways. The indiscriminate movement of construction vehicles through wetland areas must be strictly prohibited.	Ongoing	Y	.
26.8	All spills should be immediately cleaned up and treated accordingly.	As required.	Y	Y
26.9	Regularly inspect all construction vehicles for leaks. Re-fuelling must take place on a sealed surface area to prevent hydrocarbons reaching surface/subsurface water that could potentially flow to the wetland feature.	Ongoing	Y	.
26.10	Prevent run-off from work areas entering wetland habitats.	Ongoing	Y	Y
26.11	Sanitation facilities must be provided for the duration of the proposed development and all waste removed to an appropriate facility. These facilities must be located outside of the wetland features and must be regularly serviced.	Ongoing	Y	Y
26.12	Implement waste management as contemplated in the EMP in order to prevent construction related waste from entering the wetland environment.	Ongoing	Y	.
26.13	Do not allow dumping of waste material within wetland areas at any stage of the development. Do not allow any temporary storage of building material within the wetland areas.	Ongoing	Y	Y
26.14	All waste, with special mention of waste rock and spoils and remaining building material should be removed from the site on completion of the construction phase.	Ongoing	Y	Y

EMP Number	Technical and Management Commitments	Scheduling	Project Phase	
			Construction	Operation
26.15	Incorporate adequate erosion management measures in order to prevent erosion and the associated sedimentation of the wetland features. Management measures may include berms, silt fences, hessian curtains and stormwater diversion away from areas susceptible to erosion. Care should however be taken so as to avoid additional disturbance during the implementation of these measures. In this regard specific attention should be given to the attenuation of stormwater in order to prevent erosion.	Ongoing	Y	Y
26.16	Attenuate stormwater in order to prevent erosion.	Ongoing	Y	Y
26.17	Sheet runoff from paved surfaces and access roads must be curtailed.	Ongoing	Y	Y
26.18	Ensure that seepage from dirty water systems is prevented as far as possible.	Ongoing	Y	Y
26.19	Implement an alien vegetation control program within wetland areas.	Ongoing	Y	Y
26.20	Rehabilitate the natural pan in order to improve the PES of the wetland habitat, function and service provision, and the hydrological function and sediment balance of the feature.	Ongoing	Y	Y
26.21	Any discharge of runoff into wetland features must be done in such a way as to prevent erosion. In this regard special mention is made of the use of energy dissipating structures in stormwater discharge.	Ongoing	Y	Y
26.22	As much vegetation growth as possible should be promoted within the study area in order to protect soils and to reduce the percentage of the surface area which is paved. In this regard special mention is made of the need to use indigenous vegetation species as the first choice during landscaping.	Ongoing	Y	Y
27	EFFLUENT MANAGEMENT	.	.	.
	Environmental Aspect / Impact Source:	.	.	.
	Degradation of water quality. Damage to wetland habitats and catchment area.	.	.	.
	Goals and Objectives:	.	.	.
	Adhere to applicable effluent discharge standards. Minimise impacts on downstream ecosystems. Prevention of water pollution. Treat and remediate polluted water.	.	.	.
	Mitigation Measures:	.	.	.
27.1	Uncontrolled discharge of contaminants, without permission of the ECO such as fuels, oils, solvents, detergents, cement, flocculants, bitumen, other chemicals and organic materials into any water sources to be prevented.	Ongoing	Y	Y

EMP Number	Technical and Management Commitments	Scheduling	Project Phase	
			Construction	Operation
27.2	Runoff from fuel depots, workshops, and washing bays, which could potentially contain hydrocarbons, shall be directed through oil traps/ separators in good working order.	Ongoing	Y	Y
27.3	Regular inspection of oil traps/ separators for maintenance purposes.	Weekly	Y	Y
27.4	Regular maintenance of oil traps/ separators.	Ongoing, as required.	Y	Y
27.5	Appropriate corrective action to be taken in areas where water quality becomes problematic.	Ongoing	Y	Y
28	PUBLIC HEALTH, SAFETY AND SECURITY	.	.	.
	Environmental Aspect / Impact Source:	.	.	.
	Injury of people and livestock due to unauthorised access onto construction area. Construction related health, safety and nuisance impacts.	.	.	.
	Goals and Objectives:	.	.	.
	Implementation of adequate access control in order to prevent harm.	.	.	.
	Mitigation Measures:	.	.	.
28.1	All construction areas will be fenced to prevent unauthorised people and animals accessing the area.	Prior to construction	Y	.
28.2	The access gate to the construction area will be controlled and only authorised vehicles and persons will be allowed access.	Annually	Y	.
28.3	Appropriate signs shall be erected around the construction area in Afrikaans, English and Sesotho to warn people of potential dangers, specifically at points where locals and people on foot are likely to move about.	Ongoing	Y	.
28.4	Fences and gates will be maintained and repaired as soon as required.	Ongoing	Y	.
28.5	A security company to be employed to patrol the construction area and control into the site for the duration of the construction period.	24/7, ongoing	Y	.
28.6	Trespassing onto private land not to be tolerated.	Ongoing	Y	.
28.7	Security at private properties and farms near the construction site to be discussed with individual land owner / lawful occupiers of the land.	Ongoing	Y	Y
28.8	Include road safety topics in toolbox talks for contractors.	.	.	.
28.9	Present road safety topics at local schools.	Bi-annually	Y	.
28.10	Design appropriate and advance communication material such as advertisements in local papers about potential road hazards (e.g. abnormal load transport) and expected traffic volumes.	Prior to construction	Y	.

EMP Number	Technical and Management Commitments	Scheduling	Project Phase	
			Construction	Operation
28.11	A Drug and Alcohol Management Policy/ Procedure to be designed and implemented which will be applicable to all employees and contractors.	Prior to construction	Y	Y
28.12	Drug and alcohol tests to be conducted on site before anyone can enter the site, to minimise negative interactions with the local community.	Daily	Y	.
28.13	Forces to be joined with the other industries in the area to ensure adequate health services in affected communities (liaison with government and funding may be required).	Ongoing, as required.	Y	.
28.14	A Health and Safety Program to be developed and implement on site, including safety consciousness and awareness training to all workers. The program to include relevant health aspects e.g. sexual health, fatigue management and social health.	Prior to construction	Y	Y
28.15	A partnership to be formed and written agreement to be in place with a Non-Government and Non-Profit Organisations, a local government or the Department of Social Development or another existing service provider to provide the necessary social services to people whose lives are affected by infectious diseases.	Prior to construction	Y	Y
28.16	A HIV/AIDS and communicable disease strategy to be required from the contractor and tenant as part of the specifications and lease agreement for the Kathu Supplier Park.	Ongoing, as required.	Y	.
28.17	An in-house infectious diseases strategy to be developed to address health issues within the workforce. Align strategy with community HIV strategy followed by Non-Profit Organisation. Strategy to include voluntary counselling and testing and training of peer educators.	Prior to construction	Y	Y
28.18	The workplace programme to be extended for HIV beyond the company's operations, and include all contractors, suppliers, transportation companies and local communities. The spread of HIV along transportation routes (roads and railways) is well documented. This component of transportation of all goods and services to and from the project area need the following attention:	Ongoing	Y	Y
28.18.1	Select suppliers who have in-house HIV programmes and policies in place.	Ongoing	Y	Y
28.18.2	Tailored behaviour change communication materials to be developed such as mirror hanger messages and bumper stickers.	Ongoing	Y	Y
28.18.3	Condoms to be included in the road safety kit.	Ongoing	Y	Y
28.18.4	Work with truck company managers to ensure that their drivers receive adequate HIV training.	Ongoing	Y	Y
28.19	An AIDS Task Force to be formed for the Kathu Supplier Park with representatives from unions, management, local community members and people living with HIV.	Ongoing, as required.	.	Y

EMP Number	Technical and Management Commitments	Scheduling	Project Phase	
			Construction	Operation
28.20	A gender-specific outreach programme to be developed for the Kathu Supplier Park to target schools, clinic and the youth. The programme to include internal awareness formation and to be presented in a culturally sensitive manner to ensure it does not create tension inside communities.	Prior to construction	Y	Y
28.21	Any temporary fencing removed for the execution of any portion of the works is to be reinstated by the Contractor as soon as practicable.	As required	Y	.
28.22	Partnerships to be formed and existing crime control organisations to be joined such (e.g. the Community Police Forum).	Ongoing, as required.	Y	.
28.23	An Employee Assistance Program to be developed to assist employees in dealing with personal issues and minimise impact on family assistance services locally. Encourage tenants to do the same.	Prior to construction.	Y	Y