

APPENDIX E: DRAFT EMPr

ENVIROOLUTION



C O N S U L T I N G

**ENVIRONMENTAL MANAGEMENT PROGRAM (EMPRr)
for the
PROPOSED JABULANI RESIDENTIAL DEVELOPMENT**

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1. INTRODUCTION

It is understood that any development can pose various risks to the environment as well as the residents or businesses in the surrounding area. These possible risks should be taken into account during the planning phase of the development. The purpose of this document is to provide management responses that will ensure that the impacts of the development are minimised. This EMPr is, therefore, a stand-alone document, which must be used on site during each phase of the development (planning, construction and operational phases).

This document should be flexible so as to allow the contractor and developer to conform to the management commitments without being prescriptive. The management commitments prove that the anticipated risks on the environment will be minimised if they are adhered to consistently. The onus set out in the EMPr rests with the developer, main and subcontractors, which promotes responsibility and commitment. Any parties responsible for transgression of the underlying management measures outlined in this document will be held responsible of non-compliances and will be dealt with accordingly.

2. PHASES OF THE PROJECT

The process which was followed in compiling the EMPr is in compliance with NEMA EIA Regulations 2010, GN 543 Regulation 34 (a-k) and applies the principle of Integrated Environmental Management (IEM). The purpose of this EMPr is to formulate mitigation measures that are made binding on all contractors during the construction phase as well as during the operational phase.

The point of departure for this EMPr is to take a pro-active route by addressing potential problems before they occur. This should limit corrective measures needed during the construction and operational phases of the development. Additional mitigation will be included throughout the project's various phases, as required and if necessary.

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The EMPr deals with the following phases as detailed below:

2.1. The Planning Phase

The EMPr offers an ideal opportunity to incorporate pro-active environmental management measures with the goal of attaining sustainable development.

Pro-active environmental measures minimize the chance of impacts taking place during the construction and operational phase. There is still the chance of accidental impacts taking place; however, through the incorporation of contingency plans (e.g. this EMPr) during the planning phase, the necessary corrective action can be taken to further limit potential impacts.

2.2. The Construction Phase

The bulk of the impacts during this phase will have immediate effect (e.g. noise-, dust- and water pollution). If the site is monitored on a continual basis during the construction phase, it is possible to identify these impacts as they occur. These impacts will then be mitigated through the contingency plans identified in the planning phase, together with a commitment to sound environmental management from the developer.

2.3. The Operational Phase

By taking pro-active measures during the planning and construction phases, potential environmental impacts emanating during the operational phase will be minimised. This, in turn, will minimise the risk and reduce the monitoring effort, but it does not make monitoring obsolete.

3. RESPONSIBILITIES OF THE ROLE PLAYERS

3.1. Developer

The developer remains ultimately responsible for ensuring that the development is implemented according to the requirements of the EMPr. Although the developer appoints specific role players to perform functions on his/her behalf, this responsibility is delegated. The developer is responsible for ensuring that sufficient resources (time, financial, human, equipment, etc.) are available to the other role players (e.g. the ECO, ELO and contractor) to efficiently perform their tasks in terms of the EMPr. The developer is liable for restoring the environment in the event of negligence leading to damage to the environment.

The developer must ensure that the EMPr is included in the tender documentation so that the contractor who is appointed is bound to the conditions of the EMPr.

The developer must appoint an independent Environmental Control Officer (ECO) during the construction phase to oversee all the environmental aspects relating to the development.

3.2. Contractor

The contractor, as the developer's agent on site, is bound to the EMPr conditions through his/her contract with the developer, and is responsible for ensuring that he adheres to all the conditions of the EMPr. The contractor must thoroughly familiarise him/herself with the EMPr requirements before construction begins and must request clarification on any aspect of these documents, should they be unclear. The contractor must ensure that he/she has provided sufficient budget for complying with all EMPr conditions at the tender stage.

The contractor must comply with all orders (whether verbal or written) given by the ECO, project manager or site engineer in terms of the EMPr.

3.3. The Environmental Control Officer (ECO)

The Environmental Control Officer (ECO) is appointed by the developer as an independent monitor of the implementation of the EMPr. He/she must form part of the project team and be involved in all aspects of project planning that can influence environmental conditions on the site. The ECO must attend relevant project meetings, conduct inspections to assess compliance with the EMPr and be responsible for providing feedback on potential environmental problems associated with the development. In addition, the ECO is responsible for:

- Liaison with relevant authorities;
- Liaison with contractors regarding environmental management; and
- Undertaking routine monitoring and appointing a competent person/institution to be responsible for specialist monitoring, if necessary.

The ECO has the right to enter the site and do monitoring and auditing at any time, subject to compliance with health and safety requirements applicable to the site (e.g. wearing of safety boots and protective head gear).

(a) Liaison with Contractors

The ECO is responsible for informing the contractors of any decisions that are taken concerning environmental management during the construction phase. This would also include informing the contractors of the necessary corrective actions to be taken.

3.4. Environmental Liaison Officer (ELO)

The contractor must appoint an Environmental Liaison Officer (ELO) to assist with day-to-day monitoring of the construction activities. Any issues raised by the ECO will be routed to the ELO for the contractors' attention. The ELO shall be permanently on site during the construction phase to ensure daily environmental compliance with the EMPPr and should ideally also be a senior and respected member of the construction crew. Past experience has revealed that, ELO's that can relate to the work force are the most effective for information transfer and ensuring compliance with the EMPPr.

4. ENVIRONMENTAL MANAGEMENT PROGRAM (EMPr)

The following table forms the core of this EMPPr for the construction and operational phases of the development. This table should be used as a checklist on site, especially during the construction phase. Compliance with this EMPPr must be audited monthly during the construction phase and once immediately following completion of construction.

Table 1: Planning Environmental Management Program for the Proposed Jabulani Housing Development

Activity / issue	Action required	Responsible party	Frequency
APPOINTMENT AND DUTIES OF ECO	The Developer must appoint an independent Environmental Control Officer (ECO) who must monitor the contractor's compliance with the environmental management program.	Developer	Once-off
	The developer must provide the ECO and contractor with a copy of the EMPr.	Developer	Once-off
	The priority of the ECO is to maintain the integrity of the development conditions outlined in the EMPr.	ECO	Continuous
	The ECO must form part of the project management team and attend all project meetings.	ECO	Continuous
	The contractor must ensure that the construction crew attend an environmental briefing and training session presented by the ECO prior to commencing activities on site.	ECO, Contractor	Once-off
APPOINTMENT AND DUTIES OF ELO	The contractor must appoint an Environmental Liaison Officer (ELO). This person will be required to monitor the situation with a direct hands-on approach, and ensure compliance and co-operation of all personnel. He should be fluent in the languages of the Employees.	Contractor	Once-off
EMPR	This EMPr must be made binding to the main contractor as well as individual contractors and should be included in tender documentation for the construction contract.	Developer, ECO	Once-off
ENVIRONMENTAL INCIDENTS	The contractor must take corrective action to mitigate an incident appropriate to the nature and scale of the incident and must also rehabilitate any residual environmental damage caused by the incident or by the mitigation measures themselves.	ELO, ECO, Contractor	Continuous

Table 2: Construction Environmental Management Program for the Proposed Jabulani Housing Development

Activity / issue	Action required	Responsible party	Frequency
	<p>On completion of Works, the Contractor shall clear away and remove from the site all construction paint, surplus materials, foundations, plumbing and other fixtures, rubbish and temporary works of every kind. Areas thus cleared shall be graded and scarified to restore the ground to its original profile as near as practicable before topsoil placement.</p>	Contractor, ELO	Once off, as required
GENERAL	<p>All persons Employed by the Contractor or his subcontractors shall abide by the requirements of these General Environmental Protection Specifications. Any Employees of the Contractor or his subcontractors found to be in breach of any of the General Environmental Protection Specifications may be ordered by the ECO to leave the site forthwith. The order may be given orally or in writing. Confirmation of an oral order will be given as soon as practicable but lack of confirmation in writing shall not be a cause for the offender to remain on site. No extension of time will be granted for any delay or impediment to the Contractor brought about by a person ordered to leave the site.</p>	Contractor, ELO	Once off, as required

Activity / issue	Action required	Responsible party	Frequency
GENERAL	<p>With regards to the establishment of the campsite, mitigation measures as detailed in the section below will only be applicable should the workforce of the appointed contractors stay overnights. This aspect will, therefore, have to be confirmed first, on site prior to commencement of any activities. The contractor's camp, offices and storage facilities shall be located within the site boundaries. No person shall be allowed to stay on the neighbouring site, unless it is cleared with the owner. In such an event all requirements for the contractor's camp will apply.</p>	Contractor, ELO	Once off, as required
	<p>The ECO will conduct a training session with the main contractor to inform them of the site specific EMPR before the commencement of construction. Thereafter the main contractor must ensure that a copy of this EMPR is made available to his workforce and any sub-contractors and their workforce.</p>	Contractor, ELO, ELO	Once off, as required
	<p>The main contractor or developer must ensure that all sub-contractors and their workforce are familiar with the requirements of this document.</p>	Contractor, ELO, ELO	Once off, as required
	<p>A suitable and safe area for storage of the construction material is to be provided.</p>	Contractor, ELO, ELO	Once off, as required

Activity / issue	Action required	Responsible party	Frequency
<p>SITE ESTABLISHMENT</p>	<p>Contractor must provide proposed plans for layout of construction camps prior to site establishment. The plan shall show at least the following:</p> <ul style="list-style-type: none"> ▪ All lay-down yards; ▪ Vehicle fuelling areas, ▪ Ablution areas; ▪ Litter areas; ▪ Spoil sites; and ▪ Overnight vehicle parking areas. <p>The ECO must review the plans and may require the contractor to amend the plans prior to finalisation. The contractor may not establish a construction camp or any other infrastructure that would involve the unnecessary removal of natural vegetation or grading of any areas without the approval of the plan by the ECO. Where possible construction camps must be located in areas of low visual quality (e.g. near or in already disturbed areas). Stay outside the 1:100 year floodline.</p> <p>The construction camp must also be located on areas that are already disturbed.</p>	<p>Contractor, ECO</p>	<p>Once off</p>

Activity / issue	Action required	Responsible party	Frequency
	<p>The ELO must be on site during establishment of the construction camp. The ELO must demarcate areas that are out of bounds (e.g. areas with sensitive or natural plant species that will not be removed etc.) in collaboration with the ECO and relevant specialists before site establishment and must point these areas out to the contractor before site establishment. Stay outside the 1:100 year floodline.</p>	<p>ELO, ECO</p>	<p>Once off</p>
	<p>The contractor shall establish a vehicle servicing and washing area in the construction camp. This area shall have a bunded concrete floor that is dished towards an oil trap and shall be roofed. All servicing and washing of vehicles (except emergency repairs at the construction site) shall take place in this area. The oil trap shall be cleaned on a weekly basis and the oil shall be disposed at a licensed waste disposal site. (vehicles should preferably be serviced off site)</p>	<p>Contractor</p>	<p>Once off</p>
<p>SITE ESTABLISHMENT</p>	<p>Should fuel storage be required on site storage tanks shall have bunding to hold at least 110% of the volume of the tanks. The tanks must be placed on an impermeable floor. Before tanks are positioned on site the ECO must be consulted as to the correct positioning.</p>	<p>Contractor</p>	<p>Once off</p>
	<p>The contractor must provide sufficient potable water and washing facilities on site at all times to prevent a situation where construction workers have to resort to fetching water from natural water courses or washing in water courses.</p>	<p>Contractor</p>	<p>Ongoing</p>

Activity / issue	Action required	Responsible party	Frequency
	A sufficient number of portable chemical toilets should be placed within easy access of the workforce, to ensure that the surrounding environment is not used instead. These should be kept in a hygienic state with toilet paper supplied for the workforce.	Contractor, ELO	Once off, On going
	Placement of toilets should avoid the possibility of the area surrounding the toilet becoming flooded.	Contractor	As required
	Care should be taken that water points do not turn into mud baths or form open pools of standing water.	Contractor	As required
SITE ESTABLISHMENT	Fires will only be allowed in a facility especially constructed for the purpose of keeping warm and or cooking as required by the guard/s over night and at weekends. The ECO is to be informed as to the type of cooking facilities that will be used by guard before construction begins.	Contractor, ELO, ECO	Monitor continuously
	Fire wood for fires must be supplied by the contractor	Contractor, ELO, ECO	Monitor continuously
	Heavy smoke may not be released into the air.	Contractor, ELO, ECO	Monitor continuously

Activity / issue	Action required	Responsible party	Frequency
	<p>The contractor must ensure that the ECO inspects each site selected for the development of any infrastructure development such as access routes, construction camp sites, etc.</p>	Contractor	Once off
<p>VEHICLE EQUIPMENT FUELLING AND MAINTENANCE</p>	<p>Drip trays (minimum of 10cm deep) are to be placed under all vehicles if they stand for more than 3 hours. - The surface area of the drip trays will be dependant on the vehicle and must be large enough to catch any hydrocarbons that may leak from the vehicle while standing. - The depth of the drip tray must be determined considering the total amount / volume of oil in the vehicle. The drip tray must be able to contain 110% of the total amount / volume of oil in the vehicle.</p>	Contractor, ELO	Monitor continuously
	<p>Spill kits must be available in all vehicles that transport hydrocarbons for dispensing to other vehicles on the construction site. The dispensing devices (pump heads) must be compatible with the vehicles to which they are dispensing. In addition the dispensing devices must be fitted with the necessary valves / apparatus that will ensure that the nozzles do not drip fuel after pumping has stopped.</p>	Contractor, ELO	Monitor continuously
<p>VEGETATION</p>	<p>In the event of spillage of oil or fuel, steps must be taken to remove hydrocarbons (e.g. Drizit). The absorbent and soil must be removed from the site and disposed of as a hazardous waste at a licensed commercial facility.</p>	Contractor, ELO	Monitor continuously
	<p>Soil removed during the construction phase should be scanned for protected species.</p>	Contractor, ELO	Monitor continuously

Activity / issue	Action required	Responsible party	Frequency
	Soil removed during the construction phase should be scanned for protected species.	ELO	Ongoing
	No indigenous tree or shrub on or adjacent to the site shall be felled, lopped, cut or pruned until it has been clearly marked for this purpose by the Environmental Control Officer. The method of marking will be specified by the Environmental Control Officer, and the Contractor will be informed in writing.	Contractor, ELO	Once off
	All storm water management features should be constructed in a manner that will ensure the continued functioning of the emergent vegetation. Construction should coincide with the dry season.	Contractor	Ongoing
	No indigenous vegetation may be collected, or used for firewood.	Contractor, ELO	Ongoing
	Large trees to be retained or transplanted must be marked and protected against damage by construction activities. Wattle trees and other alien invasive trees must be removed.	Contractor, ELO	Ongoing
	No indigenous tree or shrub on or adjacent to the construction site shall be felled, lopped, cut or pruned without the prior written approval of the Environmental Control Officer.	ECO, ELO	Ongoing
	Although the natural grassland is transformed, the construction activities must not extend beyond the development site foot print.	ECO, ELO	Ongoing
	All disturbed areas must be rehabilitated with indigenous vegetation after construction to prevent spread of alien invasive species.	ECO, ELO	Ongoing

Activity / issue	Action required	Responsible party	Frequency
	Existing road structures must be utilised, when this is not possible the areas to be cleared for roads shall be restricted only to those that are essential for the operation, and should be clearly demarcated. Construction vehicles and workers should not stray from these areas.	ECO, ELO	Ongoing
	Under no circumstances shall any animals (wildlife and domestic animals) be handled, removed, killed or interfered with by the Contractor, his EMPloyees, his Sub-Contractors or his Sub-Contractors' EMPloyees.	ELO	Ongoing
FAUNA	Should any fossorial (burrowing) species (especially Insectivores or snakes) be killed and recovered during the construction phase, these should be adequately preserved as voucher specimens. These specimens may contribute towards biogeography patterns and animal systematics.	ELO	Ongoing
	If any Red Data species is found during the construction phase, this species must be relocated to the nearest conservation area or natural open space with suitable habitat for the particular species to continue its life history.	ELO	Ongoing
	During construction, allowance should be made for the free movement of all natural biota through unnatural barriers, such as fences, walls and stormwater management features.	ELO	Ongoing
	The Contractor shall advise his workers of the penalties associated with the needless destruction of wildlife, as set out in the Animals Protection Act (Act 71 of 1962) sec. 2	ELO	Ongoing
SENSITIVE AREAS	Construction personnel must be alert and must inform the local Council should they come across any findings.	ELO	As necessary

Activity / issue	Action required	Responsible party	Frequency
	Should any archaeological artefacts be exposed during excavation, work on the area where the artefacts were found, shall cease immediately and the ECO shall be notified as soon as possible.	ELO	As necessary
	Upon receipt of such notification, the ECO will arrange for the excavation to be examined by an Archaeologist as soon as possible.	ELO	As necessary
	Under no circumstances shall archaeological artefacts be removed, destroyed or interfered.	ELO	As necessary
	Any archaeological sites exposed during demolition or construction activities may not be disturbed prior to authorisation by the South African Heritage Resources Agency.	ELO	As necessary
	The rocky outcrops must be mapped as sensitive, be excluded from the development footprint and incorporated into the open space. The open space must be adequately linked with the wetland on the Jabulani hostel site (South of Erf 2614) to form continuous ecological open space linkage.	ELO	As necessary
	The construction crew must adhere to all the relevant laws and regulations applicable to the disposal of construction waste and rubble. The contractor shall provide a waste management strategy to the ECO and the ECO shall monitor the implementation thereof.	Contractor, ECO	Monthly
WASTE MANAGEMENT	The contractor shall provide sufficient closed containers and skips which must be on the construction site and crew camp to handle the amount of litter, wastes, and builders' wastes generated on the site.	Contractor, ELO	Ongoing
	All waste must be managed in accordance with the NEMWA 2008	Contractor	ongoing

Activity / issue	Action required	Responsible party	Frequency
	<p>The contractor shall ensure that containers are to be emptied at least on a weekly basis to avoid rodents, insects or any other organisms accumulating on the site and becoming a health hazard to adjacent properties.</p>	Contractor, ELO	Weekly
<p>WASTE MANAGEMENT</p>	<p>An educational litter program shall be introduced, which allows for the initial supply of suitable rubbish bins in the area, followed by a weekly supply of bags to all workers. Large waste containers could be provided for the dumping of larger refuse items. These must be covered and cleared once a week.</p>	Contractor, ELO	Weekly

Activity / issue	Action required	Responsible party	Frequency
WASTE MANAGEMENT	No solid waste or any materials used may be disposed of on site.	Contractor, ELO	Weekly
	No rubble or discarded building materials must remain on the construction site for more than two weeks.	Contractor, ELO	Weekly
	Burning of waste is not permitted	Contractor, ELO	Weekly
	Chemical containers and packaging brought onto the site must be removed for disposal at a suitable site.	Contractor, ELO	Weekly
AWARENESS OF WORKFORCE	All hazardous waste is to be removed to a registered waste dump site the contractor is required to produce proof that the waste was collected or dumped at a registered site. Hazardous waste must be managed according to the NEMWA 2008	Contractor, ECO	Ongoing
	All the persons employed by the contractors shall abide by the requirements of the general environmental protection specifications.	Contractor, ELO, ECO	Monthly
WATER POLLUTION AND HYDROLOGY	It is the contractor's responsibility to ensure that the workforce is aware of and conforms to the environmental guidelines that are applicable in this EMPR.	Contractor	Continuous
	No uncontrolled discharges from the site / working area to depressions shall be permitted. All discharge points will require approval e.g. wastewater discharges include concrete mixing, vehicle washing etc.	Contractor, ECO	As necessary

Activity / issue	Action required	Responsible party	Frequency
<p>WATER POLLUTION AND HYDROLOGY</p>	<p>Should surface water in the surrounding area be polluted, and fauna and indigenous flora show signs of deterioration or death, specialist hydrological or ecological advice must be sought for the appropriate treatment and remedial procedures to be followed. The requirements for such input shall be agreed with the engineer. If liability is found to rest with the contractor, the costs of containment and rehabilitation shall be on the contractor's account, including the costs of specialist input.</p>	<p>Contractor, ECO</p>	<p>As necessary</p>

Activity / issue	Action required	Responsible party	Frequency
WATER POLLUTION AND HYDROLOGY	Spill kits must be available in all vehicles that transport hydrocarbons for dispensing to other vehicles on the construction site. The dispensing devices (pump heads) must be compatible with the vehicles to which they are dispensing. In addition the dispensing devices must be fitted with the necessary valves / apparatus that will ensure that the nozzles do not drip fuel after pumping has stopped. Refuelling should take place in a centrally located area and must comply with the Occupational Health and Safety Act (Act No. 85 of 1993).	Contractor, ECO	As necessary
	Construction vehicles shall be maintained in good working order, to reduce the probability of leakage of fuels and lubricants. Drip trays must be made readily available for vehicles that leak and for the vehicles standing overnight.	Contractor, ECO	As necessary
	To prevent erosion of material that is stockpiled for long periods, the material must be retained in a bunded area.	Contractor, ECO	As necessary
	The temporary storage of topsoil, inert spoil, fill, etc. should be away from storm water management systems.	Contractor, ECO	Ongoing
	A dedicated storage container shall be used to accommodate chemicals such as fuel, oil, paint, herbicide and insecticides, as appropriate.	Contractor, ECO	Ongoing
	Storage of potentially hazardous materials should be above the 1:100-year flood line, or as agreed with the ECO. These materials include fuel, oil, cement, bitumen, etc. The container should be stored on a concrete bunded platform.	Contractor, ECO	Ongoing
	Concrete shall be mixed on mixing trays only, not on exposed soil . Concrete shall be mixed only in areas, which have been specially demarcated for this purpose.	Contractor, ECO	Ongoing
	All concrete that is spilled outside these areas shall be promptly removed by the Contractor and taken to an approved dumpsite.	Contractor, ECO	Ongoing

Activity / issue	Action required	Responsible party	Frequency
WATER POLLUTION AND HYDROLOGY	After all the concrete mixing is complete all waste concrete shall be removed from the batching area and disposed of at an approved dumpsite.	Contractor, ELO	Ongoing
	Stormwater shall not be allowed to flow through the batching area. Cement sediment shall be removed from time to time and disposed of in a manner as instructed by the ECO.	Contractor, ECO	Ongoing
	All construction materials liable to spillage are to be stored in appropriate structures with impermeable flooring.	Contractor, ELO	Ongoing
	The contractor shall provide and maintain portable chemical toilets for construction crews. Maintenance must include their regular removal without sewage spillage.	Contractor, ELO	Ongoing
	Under no circumstances may ablutions occur outside of the provided facilities.	Contractor, ELO	Ongoing
	In the case of any water pollution incident, the Regional Representative of the Department of Water Affairs must be informed immediately.	Contractor, ECO	Ongoing
	Underground services should be designed in such a way so as to require minimum maintenance to avoid disturbance of the underground environment.	Contractor, ELO	Ongoing

Activity / issue	Action required	Responsible party	Frequency
<p>WATER POLLUTION AND HYDROLOGY</p>	<p>Only waterborne sewerage reticulation is permitted.</p>	<p>Contractor, ELO</p>	<p>Ongoing</p>
	<p>Stormwater at the construction camps must be managed so as to reduce potential silt loads in stormwater run-off. Measures must be implemented to distribute storm water as evenly as possible to avoid point sources of erosion.</p>	<p>Contractor, ELO</p>	<p>Ongoing</p>
<p>SOIL EROSION</p>	<p>All trenches and excavations to be properly bench filled according to required specifications. The contractor must ensure that all backfilling follows the line present in the landscape, ensuring the topsoil layer forms a convex shape so as not to create a man made runnel for storm water flow. All construction areas should be suitably top soiled and vegetated as soon as is possible after construction.</p>	<p>Contractor, ELO</p>	<p>Ongoing</p>
	<p>Appropriate flow diversion and erosion control structures i.e. earth embankments must be put in place where soil may be exposed to high levels of erosion due to steep slopes, soil structure, etc Should a storm displace the temporary earth embankments or other erosion control structures, a visual inspection of the drainage line must be made and any damage be recorded. Any damage and loss of soil resulting from a storm is to be remedied immediately. Should the walls collapse due to construction error, the contractor is to fund the remediation process.</p>	<p>Contractor, ELO</p>	<p>Ongoing</p>
	<p>Clearing on slopes: If clearing occurs within the rainy season (October to April), an earth berm (minimum of 30cm, preferably 60cm high) must be created along the up-slope side of the construction area, at the edge of the cleared area. The berms must be constructed of stones from within the cleared areas / gravel and covered with soil being removed within the area being cleared.</p>	<p>Contractor, ELO</p>	<p>Ongoing</p>

Activity / issue	Action required	Responsible party	Frequency
AIR POLLUTION	<p>Construction activities will not be the source of dust production. Continual watering of the site should be carried out to prevent dust production during windy and dry conditions. There must be a continuous dust monitoring process throughout construction. The impact of dust emission must be minimal and must not be allowed to cause a nuisance to residents of surrounding areas.</p>	Contractor, ECO	Ongoing
	A speed restriction of 40km/h must be enforced and monitored on site for all construction vehicles.	ELO	Ongoing
	The existing access roads should be used, where possible. Where new access roads are required, they should disturb as limited an area as possible.	Contractor, ECO	Continuous
ACCESS ROADS AND TRAFFIC IMPACT	<p>Areas demarcated as being out of bounds for construction personnel must be sign posted and must be regarded strictly as 'no-go' areas. No contractor's personnel, vehicles or machinery may access these areas. Very strict control must be exercised over this aspect of construction activities.</p>	Contractor	Ongoing
	Vehicular movement of construction vehicles beyond the property boundaries of the site should be outside the am and pm peak hours.	Contractor, ELO	As necessary
	Ensure that the necessary signage and traffic measures are implemented for safe and convenient access to the site from. Measures must also be put in place to ensure that these access points do not get built up with mud or sand.	Contractor, ELO	As necessary
SAFETY AND SECURITY	The contractor shall ensure that only suitably qualified personnel use construction vehicles.	Contractor, ELO	Ongoing
	The contractor shall ensure that the contact details of the police or security company and ambulance services are available on site.	Contractor	As necessary

Activity / issue	Action required	Responsible party	Frequency
SAFETY AND SECURITY	The contractor shall limit access to construction crew camp and construction sites to construction workers through an access control system, demarcated areas and signs.		Ongoing
	The site and crew are to be managed in strict accordance with the Occupational Health and Safety Act, 1993 (Act No.85 of 1993) and the National Building Regulations.	Contractor, ECO	As necessary
	The implementation of adequate and appropriate fencing and/or barriers between the site and adjoining properties and developments must be undertaken, to ensure sensitivity to adjoining residents/businesses and their properties, particularly during construction phases. The fences, once erected have to be checked and maintained should any existing wall/fence be removed during construction.	Developer, Contractor	As necessary
	The contractor must supply his own security arrangements for the construction camp. Limit access to the construction crew camp only to the workforce. Do not allow the movement of public within the development site by posting notices at the entrance gates and perimeter fencing/walls.	Contractor	As necessary

Table 4: Operational Environmental Management Plan for the proposed Jabulani Housing Development

Activity / issue	Action required	Responsible party	Frequency
SITE MANAGEMENT	<p>The developer must appoint an Estate Manager, who will <i>inter alia</i> be responsible for the implementation of the EMPR and sound environmental management during the operational phase.</p> <p>A maintenance plan for the development must be developed with regard to maintaining buildings and perimeter fencing etc. in order to ensure that they do not deteriorate and become aesthetically unpleasant.</p>	Developer, Estate manager, Management body	As required
EROSION, SEDIMENTATION AND FLOODING	<p>The stormwater system, especially the discharge points, must be inspected and damaged areas must be repaired if required.</p> <p>Litter blocking stormwater system must be removed.</p>		
GROUND WATER QUALITY	Any damages to the sewage system must be repaired immediately.		
WATER SUPPLY	Inspect the site for burst, blocked or leaking water pipes and repair as required.		
SEWAGE	The sewage system must be inspected for leakages on a regular basis and any leakages must be attended to immediately.		

Activity / issue	Action required	Responsible party	Frequency
NOISE IMPACT	All activities on the site must abide by the National Noise Laws and the local noise by-laws.		
WASTE	Disposal of all domestic waste must be undertaken by the local council or an independent company.		
MANAGEMENT	Litterbins should be placed at strategic points within the development, to be determined during the initial design phase and implemented during the operational phase. these bins must be cleared on a regular basis to ensure that they don't become over full		
	A waste collection point must be designed where skip bins can be positioned in order to contain waste until it gets removed to for dumping off site.		
SAFETY AND SECURITY	All waste must be managed in accordance with the National Environmental Management Waste Act of 2008	Developer, Estate manager, Management body	As required
	Entrance and exit gates must be illuminated at night and inspected for defects.		
	Boundary wall if present must be regularly inspected and maintained to prevent any damage.		
	It must be ensured that a backlog of traffic does not develop at the access points during peak hours, through the implementation of an efficient and effective access control systems.		
	All buildings and landscaped areas must be maintained.		

Activity / issue	Action required	Responsible party	Frequency
	<p>Security lights are to be angled downwards to avoid disturbance to adjoining residents. Illumination of the buildings must take into account the possible distraction glare might have on motorists using.</p>		
TRAFFIC IMPACT	<p>An emergency plan must be developed and kept on site. Ensure that all fire extinguishers are replaced on or before their expiry dates. Ensure that pump devices are in good working order.</p>		
VISUAL AND AESTHETIC	<p>External dustbins should be cleaned at least once a week in a maintenance plan for the development.</p>	Developer, Estate manager, Management body	As required
	<p>The development should be kept clean through the removal of litter on a daily basis. This should be included in a maintenance plan for the development.</p> <p>Ensure that the refuse is collected on a regular basis.</p>		

6. CONCLUSION

Provided this project is mitigated, as per the EMPr, the project will result in limited negative environmental impacts that can be mitigated through implementation of this EMPR. It is the applicant's responsibility to ensure that this EMPR is made binding on the contractor by including the EMPr in the contract documentation. The contractor should thoroughly familiarise themselves with the requirements of the EMPR and appoint an environmental liaison officer (ELO) to oversee the implementation of the EMPr on a day-to-day basis.

Parties responsible for transgression of this EMPr should be held responsible for any rehabilitation that may need to be undertaken. Parties responsible for environmental degradation through irresponsible behaviour/negligence should receive penalties.

APPENDIX 1: INCIDENT AND ENVIRONMENTAL LOG

ENVIRONMENTAL INCIDENT LOG

Date	Env. Condition	Comments <i>(Include any possible explanations for current condition and possible responsible parties. Include photographs, records etc. if available)</i>	Corrective Action Taken <i>(Give details and attach documentation as far as possible)</i>	Signature

COMPLAINTS RECORD SHEET	File Ref:	DATE:
	Page of

COMPLAINT RAISED BY:

CAPACITY OF COMPLAINANT:

COMPLAINT RECORDED BY:

COMPLAINT:

PROPOSED REMEDIAL ACTION:

ECO: _____ Date: _____

NOTES BY ECO:

ECO: _____ Date: _____ Site Manager: _____ Date: _____

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