



Portion A

OKAKARARA | TOWNSHIPS ESTABLISHMENT

Environmental Management Plan (EMP)

July 2013

Okakarara
Proper

Portion C

Portion

Portion 6

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1 INTRODUCTION

The Okakarara Town Council and its Public-Private Partner (PPP) Veinatobias Organizational and Sustainable Development Planners (Pty) Ltd are preparing the town of Okakarara for future development. In 2010 a 20 year spatial plan was compiled to serve as a development framework up until 2030. Part of this spatial plan includes the Townships Establishment of Five townships within the Remainder of the Farm Okakarara Townlands No. 517:

- Portion A (to be known as Okakarara Extension 3);
- Portion B (to be known as Okakarara Extension 4);
- Portion C (to be known as Okakarara Extension 5);
- Portion D (to be known as Okakarara Extension 6); and
- Portion 6 (to be known as Ellis Park Eco Village).

This document details the Environmental Management Plan (EMP) as informed by the Environmental Impact Assessment (EIA) conducted for these Townships Establishment.

An EMP is a control framework for implementing the management actions described in an EIA. This EMP has been established to ensure that the project complies with the Namibian Environmental Management Act (No. 7 of 2007). This plan describes the management actions to be implemented during the following phases of this project:

- **Planning and Design** – the period, prior to the drafting of construction tender documents, during which preliminary legislative and administrative arrangements, necessary before any erven are sold, are made and detailed engineering designs/drawings are carried out;
- **Construction Tender Preparation** – the period during which the OTC, having secured the necessary legislative and administrative arrangements, prepare construction tender documents for the development of services infrastructure to service the various erven as well as any other construction process within the Portions A, B, C, D and 6;
- **Construction** – the period during which the services infrastructure will be constructed to service the various erven within the subdivided townships;
- **Operation and Maintenance** – the period during which the services infrastructure will be fully functional; and
- **Decommissioning and Rehabilitation** – the period during which a particular industrial activity is decommissioned and the associated infrastructure is demolished/decommissioned.

In addition to detailing specific management actions throughout the life cycle of the project, this EMP also describes the roles and responsibilities of those who are to administer this plan.

The commitments described here form part of the Environmental Clearance Certificate (ECC) (also known as the environmental contract) between the PPP and the state, as represented by the Ministry of Environment and Tourism (MET). Non-compliance is considered illegal and may have legal consequences. The amendment, transfer or renewal of the ECC should be communicated to the Environmental Commissioner as stipulated in the Environmental Management Act (EMA) of 2007 (S 39-42) as well as any changes to this EMP.

2 RESPONSIBILITIES

The responsibility for the implementation of the EMP ultimately lies with the Okakarara Town Council (OTC) (the Developer), who is also responsible for the eventual operation of the project. The implementation of this EMP requires the involvement of several stakeholders, each fulfilling a different but vital role to ensure sound environmental management during each phase of the project.

The Developer should appoint an Employer's Representative (ER) to oversee all aspects of the project (including all contracts for work outsourced) – one for the construction phase and one for the operational phases (both of these positions may be assigned to one person). The ER will in turn appoint an Environmental Control Officer (ECO) to oversee the implementation of the whole EMP. The following positions and their respective responsibilities will be outlined:

- Employer's Representative;
- Environmental Control Officer; and
- Contractor (Construction and Operations and Maintenance).

2.1 EMPLOYERS REPRESENTATIVE (ER)

The ER is appointed by the Developer to manage all contracts for work/services that are outsourced during the construction, operations and maintenance and decommissioning phases. This position may be filled by any competent member of the Town Council, or Town Council technical staff member. Any official communication regarding work agreements is delivered through this person. The ER should with the commencement of the project appoint a competent ECO who will represent the Developer on-site.

The ER shall assist the ECO where necessary and will have the following responsibilities regarding the implementation of this EMP:

- Ensuring that the necessary environmental authorisations and permits have been obtained by the Contractor;
- Assisting the Contractor in finding environmentally responsible solutions to problems with input from the ECO where necessary;
- Ordering the removal of person(s) and/or equipment not complying with the EMP;
- Issuing fines for transgression of site rules and penalties for contravention of the EMP; and
- Providing input into the ECO's ongoing internal review of the EMP. This review report is submitted on a monthly basis to the Developer.

2.2 THE ENVIRONMENTAL CONTROL OFFICER (ECO)

The ECO should be a competent person appointed by the ER to fulfil this role as the Developer's representative to monitor and review the on-site environmental management and implementation of the EMP by the Contractor. If no ECO is appointed the duties of the ECO fall upon the ER.

The ECO's duties include the following:

- Assisting the ER in ensuring that the necessary environmental authorisations and permits have been obtained;
- Maintaining open and direct lines of communication between the ER, Developer, Contractor, and I&APs with regard to environmental matters;
- Monthly site inspection of all construction areas with regard to compliance with the EMP;
- Monitor and verify adherence to the EMP (audit the implementation of the EMP) and verify that environmental impacts are kept to a minimum;
- Taking appropriate action if the specifications of the EMP are not adhered to;
- Assisting the Contractor in finding environmentally responsible solutions to problems;
- Monthly inspection to verify whether or not all new personnel coming onto site receive environmental awareness training;
- Advising on the removal of person(s) and/or equipment not complying with the specifications of the EMP via the ER;

- Recommending the issuing of fines for transgressions of site rules and penalties for contraventions of the EMP; and
- Undertaking a continual review of the EMP and recommending additions and/or changes to the document.

2.3 THE CONTRACTOR

The Contractor shall be responsible for the implementation of the EMP, onsite monitoring and evaluation of the EMP. It is envisaged that various contractors will be appointed at various times and for various tasks throughout the life cycle (construction through to decommissioning phase) of this project. These can be broadly grouped into Construction Contractors and Operations and Service Contractors. In order to ensure sound environmental management, the relevant sections of this EMP should be included in all contracts of work outsourced thus legally binding all appointed contractors. All contractors shall ensure that adequate environmental awareness training (see **Section E**) of senior site personnel takes place and that all construction workers and newcomers receive an induction presentation on the importance and implications of the EMP. The presentation shall be conducted, as far as is possible, in the employees' language of choice.

The Contractor should keep records of all environmental training sessions, including names, dates and the information presented.

3 LEGAL REQUIREMENTS

Table 1: Legal provisions applicable at various phases throughout the project lifecycle

THEME	LEGISLATION INSTRUMENT	MANAGEMENT REQUIREMENTS	CONTACT PERSON
Archaeology	National Heritage Act 27 of 2004	Apply for a permit to the National Heritage Council in order to carry out works or activities in a protected place (S 48).	Rev Salomon April Tel: (061) 244 375/385/594
Compensation	Compensation Policy Guidelines for Communal Land (applied with effect from April 2008)	Details specific amounts to be paid for loss of: <ul style="list-style-type: none"> • Cultivated land • Grazing/Uncultivated land • Structures • Fruit-bearing trees 	N/A
Environmental Assessment	<ul style="list-style-type: none"> • Environmental Management Act 7 of 2007 • EIA Regulations (EIAR) GN 57/2007 (GG 3812) 	<ul style="list-style-type: none"> • The amendment, transfer or renewal of an Environmental Clearance Certificate needs to be communicated to and receive approval from the Environmental Commissioner (EIAR, S 39-42). • Requirements regarding the content of an Environmental Management Plan (EMP) (EIAR, S 8(j)) 	Dr Freddy Sikabongo/Ms Saima Angula Tel: 061-284 2717
Forestry	Forest Act 12 of 2001	Protected tree species and any vegetation within 100m from a watercourse may not be removed without a permit from the Ministry of Agriculture, Water and Forestry.	Otjiwarongo Forestry Office Tel: 067-303 307
Labour	<ul style="list-style-type: none"> • Labour Act (LA) 11 of 2007 • Health and Safety Regulations (HSR) GN 156/1997 (GG 1617). 	<ul style="list-style-type: none"> • Procedures regarding the presence of hazardous substances on site (HSR, S 176-195). • Appoint a Safety Officer (HSR, S 6). • All construction workers to participate in regularly scheduled environmental and safety induction (HSR, S 2) every 6 months or as instructed by the ECO due to recurring incidents. • Adhere to minimum wage (LA, S 10-14). • Provide personal protective clothing (HSR, S 210-217). • Make provision for first aid and emergency arrangements (HSR, S 228-242). 	N/A

4 MANAGEMENT REQUIREMENTS

This EMP has been structured so as to provide its various intended recipients (ER, consulting engineers and contractors) with mitigation measures immediately applicable to their respective scopes of work. The management requirements for the various recipients of this project are divided according to the main project phases:

- Development Guidelines (**Table 2**);
- Planning and Design Phase requirements (**Table 3**);
- Construction Tender Preparation Phase requirements (**Table 4**);
- Construction and Operation and Maintenance management requirements (**Table 5**); and
- Operation and Maintenance Phase management requirements (**Table 6**).

5 DEVELOPMENT GUIDELINES

The management provisions detailed below are applicable (enforceable) once these townships have been officially established/ gazetted. Hence, these management provisions should inform and guide future development activity. The industrial activities listed below have been sourced from the Okakarara Town Planning Scheme, which should be read in conjunction with these guidelines. In addition the Environmental Management Act (7 of 2007) EIA Regulations should also be consulted in instances where additional administrative and legislative clarity is sought.

The OTC should ensure that the management provisions included in the table below receive additional legal force by a combination of the following or other possibilities:

- Include the document in the sale agreements;
- Including relevant provisions in the title deed upon sale of an erf or several erven;
- Include a clause in the title deed referring the guidelines; and
- Include an amendment in the Town Planning Scheme which acknowledges the provisions of this EMP as legally binding.

Legal advice would have to be sought in order to find the best combination of the above mentioned possibilities, or determine if additional options exist to ensure these guidelines receive the necessary legal force.

Table 2: Guidelines for future development within Portions A, B, C, D and 6

ACTIVITES NOT ALLOWED	PERMISSIBLE ACTIVITIES	ACTIVITIES REQUIRING AN ENVIRONMENTAL CLEARANCE CERTIFICATE FROM THE DEA	PERMISSIBLE ACTIVITIES REQUIRING APPROVAL FOR EMP FROM DEA
PORTION D			
<ul style="list-style-type: none"> • All activities listed under the definition for “Noxious industrial building with the exception of those activities listed under the column “Permissible Activities” • Activities with daily/ weekly discharges of inorganic/ hazardous material (as defined in the Hazardous Substances Ordinance of 1974) as part of the effluent stream (e.g. manganese smelter, coal power station and leather tannery) • Chemical works • Paint works • Breweries and distilleries 	<ul style="list-style-type: none"> • Only walkways, benches and fences may be constructed within the public open space buffer designated for the banks of the Omatako River (see Figure 1). • The construction (as well as operation and maintenance) of the above mentioned recreational facilities could be put out on tender and the rehabilitation of the river included as part of the scope of work (erosion control measures with the use of gabions, or revegetating the banks of the river). • The OTC should make provision for incentives, or conditions for industrial erven located adjacent to the Omatako River (182 and 224), pertaining to the rehabilitation of the land closest to the river (e.g. erosion control measures 	<ul style="list-style-type: none"> • The construction of a new wastewater treatment facility and associated infrastructure. • Construction of a treatment facility for the disposal of blood, bones, entrails etc. • The generation and supply of electricity 	<p>Activities with an organic/ biodegradable effluent stream may take place within the area designated for industrial activity:</p> <ul style="list-style-type: none"> • Premises for the storing or mixing of manure; • Abattoirs; • Works where meat, bones, blood, offal or other animal organic matter is handled; and • Bricks and lime-works. <p>These activities may only be carried out under the following conditions:</p> <ul style="list-style-type: none"> • A new wastewater treatment facility needs to be constructed designed to handle the volumes of effluent produced by the prospective industrial activity; • A hazardous waste treatment facility needs to be constructed designed to handle the waste from the forthcoming agro-industrial activities such as blood, offal/entrails, bones, hooves etc. • Each activity which intends to discharge effluent should apply for the necessary discharge permits from the Ministry of Water Agriculture and Forestry; • An activity-specific Environmental Management Plan (EMP) needs to be compiled by an experienced Environmental Assessment Practitioner who is independent from the interests of the company wishing to undertake a given industrial activity; • The activity-specific EMP must be submitted for

ACTIVITES NOT ALLOWED	PERMISSIBLE ACTIVITIES	ACTIVITIES REQUIRING AN ENVIRONMENTAL CLEARANCE CERTIFICATE FROM THE DEA	PERMISSIBLE ACTIVITIES REQUIRING APPROVAL FOR EMP FROM DEA
	<p>with the use of gabions, or revegetating the banks of the river).</p>		<p>scrutiny and approval to the DEA who in turn should assess the EMP for compliance with this Townships EMP document;</p> <ul style="list-style-type: none"> • The activity-specific EMP should be updated and resubmitted to the DEA for scrutiny and approval every three years. • Each activity-specific EMP must include as a minimum the following: <ul style="list-style-type: none"> – A brief description of the project and the receiving environment; – A clear and concise description of the roles and responsibilities of all key role players (e.g. the Contractor, ECO etc.); and – Mitigation measures for Construction, Operation and Maintenance and Decommissioning and Rehabilitation phases.
PORTIONS A, B, C & 6			
<p>Adhere to all provisions of the Okakarara Town Planning Scheme.</p>	<p>Playground and/ or barbeque facilities, pathways and fencing may be constructed within the area along the south-eastern boundary of Portion B (see Figure 1), designated for public open space.</p> <p>The construction (as well as operation and maintenance) of the above mentioned recreational facilities could be put out on tender</p>	<p>Adhere to the provisions of the EIA Regulations (GG No 4878 - GN No 28-30).</p>	<p>The following activity should adhere to the conditions laid out for EMPs above:</p> <ul style="list-style-type: none"> • Grey water treatment facility.

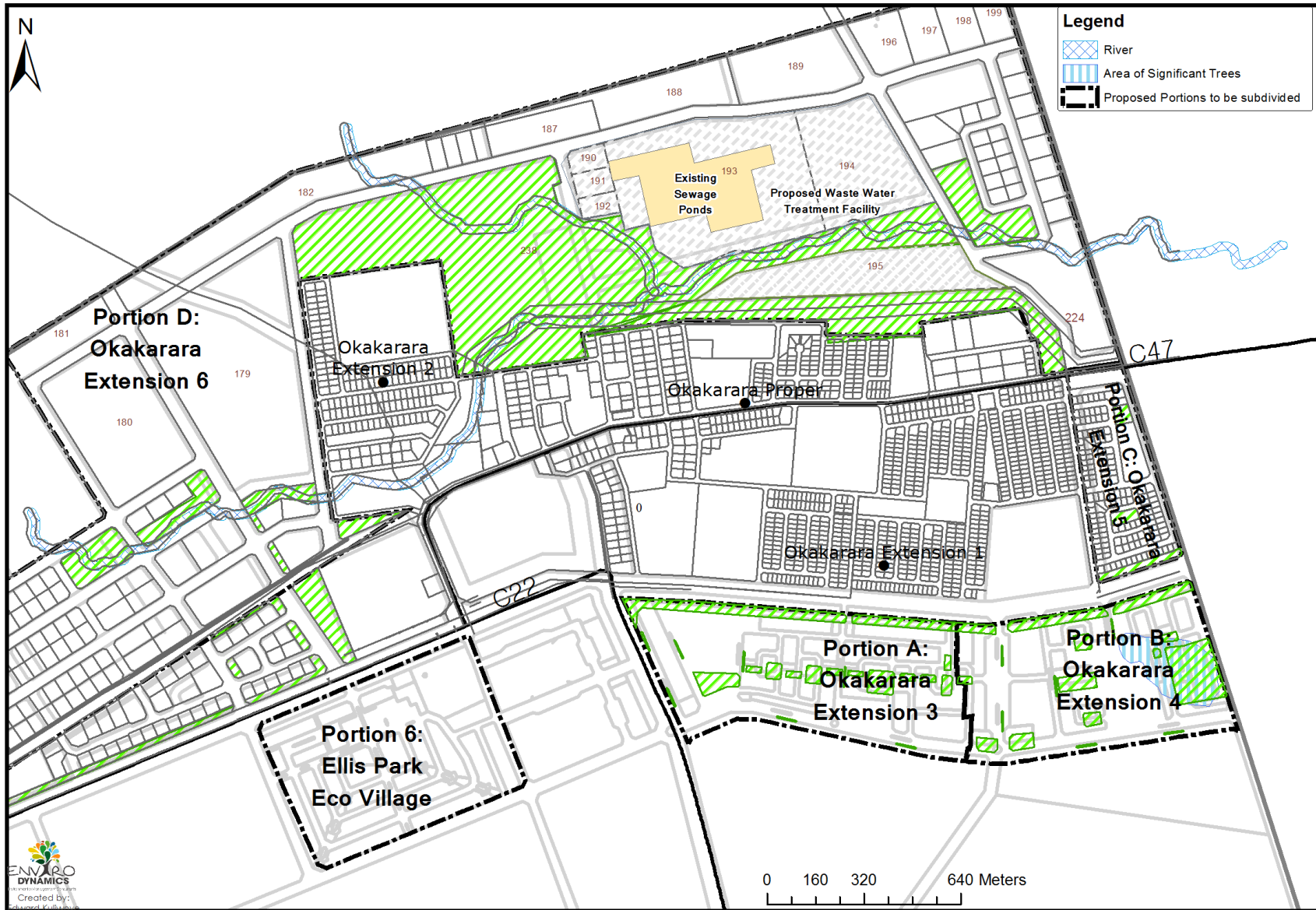


Figure 1: Map displaying biophysical environmental sensitivities for Portions A, B, C and D

6 PLANNING AND DESIGN PHASE

The management requirements detailed in the table below need to be carried out before any tender documents are drafted for the construction of services infrastructure while necessary preliminary legislative and administrative arrangements are made in preparation for the sale of erven. These management requirements are also applicable for the period during which detailed engineering designs/drawings are carried out.

Table 3: Management requirements for the Planning and Design phase

ASPECT	MANAGEMENT REQUIREMENTS
Resettlement and compensation	<p>All Portions:</p> <ul style="list-style-type: none"> • A Resettlement and Compensation Plan (RCP) should be compiled before any residents are resettled. <ul style="list-style-type: none"> – Comprehensive consultations should be held with each household to be resettled, where the details of the RCP are clearly communicated and minutes of these consultations are taken.
Flooding	<p>Portion D:</p> <ul style="list-style-type: none"> • No flood study has been conducted for the stretch of the Omatako River which runs through Portion D and as such it is critical that consideration should be given to the risks of flooding during the planning and design of facilities to be constructed within erven 191-195 and 224 (see Figure 1). • Ecologically sensitive engineering solutions should be sought to address potential flood risks (i.e. the demarcation of buffer areas, or the raising of building foundations in flood prone areas). The river should not be canalised.
Waste management	<p>Portion D:</p> <ul style="list-style-type: none"> • The construction of a New Wastewater Treatment Facility (NWTF) should undergo an EIA as required by the EIA Regulations (in order to obtain an Environmental Clearance Certificate). • Designs for the NWTF, including the associated biogas power generator, should adhere to the following provisions: <ul style="list-style-type: none"> – Adhere to the requirements described for flooding above; – In order to ensure efficient and long-term sustainable operation, at least two biodigester units should be constructed – a larger one for the proposed agro-industrial effluent and a smaller one for the sewage from residential areas. • A waste treatment facility needs to be constructed to handle animal waste products like blood, bones, entrails etc.
Permits	<p>All Portions:</p> <ul style="list-style-type: none"> • Obtain domestic and industrial effluent discharge permits before tender documents are drafted. • Obtain water reticulation permits before tender documents are drafted.
Sewage	<p>All Portions:</p>

ASPECT	MANAGEMENT REQUIREMENTS
reticulation	<ul style="list-style-type: none"> • A complete water and sewer reticulation for all Portions needs to be done and should comply with this Townships EMP <p>Portion D:</p> <ul style="list-style-type: none"> • Sewerage lines to be placed on the banks of the river outside of the 13 m buffer zone (area with no trees) and flood risk area. • Sewer pipes should avoid crossing any river. Where this is not possible the design should comply with the South African Bureau of Standards (SABS) 1200 for sewer pipe designs.
Run-off	<p>Portion D:</p> <ul style="list-style-type: none"> • Storm water Management Plan should be developed by OTC for all Portions and include as a minimum the following: <ul style="list-style-type: none"> – Channel run-off water in channels using natural rocks. – Storm water channels should be accommodated next to roads in the reserve – Minimise paved or impermeable areas. – Run-off from areas where surface water might become contaminated (e.g. areas near outdoor animal holding pens) should be captured, detained and treated to sewage effluent standards. – As far as possible uncontaminated run-off should be diverted around areas described above.
Borrow pit investigation	<p>Borrow pit investigations need to include environmental considerations and requirements:</p> <ul style="list-style-type: none"> • As first option investigate/explore the use of local building sand suppliers to supply the project's building sand requirements. • Ensure that all borrow pits utilised, commercial or private, have environmental clearance and Environmental Management Plans in place which are being implemented. • Avoid sensitive areas (e.g. areas with high biodiversity, protected archaeological sites, rivers or drainage lines).
EMP Implementation	<p>The OTC needs to appoint an Employer's Representative (ER) (or assign the role to an existing Town Council member or technical staff member) that could act as the Employer's on-site implementing agent. This person will be responsible to ensure that the OTC's responsibilities are executed in compliance with relevant legislation and this Townships EMP</p>

7 CONSTRUCTION TENDER PREPARATION PHASE

The management requirement described below should be consulted and carried out whenever a construction tender document is prepared.

Table 4: Construction tender preparation phase management requirements

ASPECT	MANAGEMENT REQUIREMENTS
EMP implementation	<p>All Portions:</p> <p>Relevant sections of this Townships EMP should be included in the tender documents for all development so that tenderers can make provision for implementation of the EMP:</p> <ul style="list-style-type: none"> • Construction of services infrastructure (Table 5) • Maintenance of services infrastructure (Table 6)
Financial provision	<ul style="list-style-type: none"> • Financial provision for the compilation of a Waste Management Plan should be included as a cost item within tenders concerning the construction and/or maintenance of services infrastructure. • Financial provision for topsoil management and the rehabilitation of borrow pits should be included as a cost item within construction tender documents, • Financial provision for the co-opting of a health officer from the Ministry of Health and Social Services to facilitate HIV/AIDS and TB education programmes periodically on site during the construction phase should be included as a cost item within construction tender documents. • Financial provision for the facilitation of an induction programme for both senior, casual construction personnel as well as subcontractors and associated personnel should be included as a cost item within tenders concerning the construction and/or maintenance of services infrastructure. • Financial provision for the compilation of a Tree Management Plan should be included as a cost item within construction tender documents. • Financial provision for the drafting of a Communication Plan should be included as a cost item within construction tender documents.
Recruitment	<ul style="list-style-type: none"> • Provisions designed to maximise the use of local labour should be included within tenders concerning the construction and/or maintenance of services infrastructure. • A provision stating that all unskilled labour should be sourced from local communities should be included within tenders concerning the construction and/or maintenance of services infrastructure. • Specific recruitment procedures ensuring local firms enjoy preference during tender adjudication should be included within tenders concerning the construction and/or maintenance of services infrastructure. • Provisions promoting gender equality pertaining to recruitment should be included within tenders concerning the construction and/or maintenance of services infrastructure. <ul style="list-style-type: none"> – Women should be given preference for certain jobs (e.g. flag bearers)

8 CONSTRUCTION MITIGATION DETAILS

The following table provides a large scale overview of all the major environmental management themes pertaining to construction mitigation details. This table serves to act as quick reference, for the detailed mitigation details that follow below, for the implementation of the construction component of this EMP and any other construction taking place within the five townships in question.

Table 5: Generic and site-specific environmental management actions for the construction phase

THEME	OBJECTIVE	MITIGATION DETAIL
Waste management	Avoid and where not possible minimise all pollution associated with construction..	Section A
Borrow pits	Ensure topsoil protection and post-construction rehabilitation.	Section B
Health and safety	Safeguard health and safety of labourers and general public.	Section C
Dust and noise	Avoid and where not possible minimise dust and noise associated with construction.	Section D
Environmental training and awareness	Awareness creation regarding the provisions of the EMP as well as importance of safeguarding environmental resources.	Section E
Environmental conservation	Minimise construction activity footprint and safeguard biodiversity in ecologically sensitive areas.	Section F
Employment/ Recruitment	Minimise negative conflict through legal and fair recruitment practices.	Section G
Stakeholder communication	Provide a platform for stakeholders to raise grievances and receive feedback and hence minimise negative conflict	Section H
Socio-economic and Miscellaneous	Ensure due consideration is given to matters regarding the cultural and general wellbeing of the affected community and matters incidental thereto.	Section I

SECTION A: WASTE MANAGEMENT

ASPECT	MITIGATION MEASURE
Waste management plan	The Contractor should compile a Waste Management Plan which should address as a minimum the mitigation measures included below.
Hazardous waste	<ul style="list-style-type: none"> • All heavy construction vehicles and equipment on site should be provided with a drip tray. <ul style="list-style-type: none"> – Drip trays are to be transported with vehicles wherever they go. – Drip trays should be cleaned daily and spillage handled, stored and disposed of as hazardous waste. • All heavy construction vehicles should be maintained regularly to prevent oil leakages. • Maintenance and washing of construction vehicles should be take place only at a designated workshop area. <ul style="list-style-type: none"> – The workshop area should be lined with concrete. – The workshop should have an oil-water separator for collect run-off from washing. • Spilled concrete (wet or dry) should be treated as hazardous waste and disposed of by the end of each day in the appropriate hazardous waste containers. • All hazardous substances (e.g. fuel etc) or chemicals should be stored in a specific location on an impermeable surface which is bunded.
Sewage and grey water	<ul style="list-style-type: none"> • Do not allow the sewage (black water) to be discharged directly onto open soil. • All sewage must be removed regularly and disposed of at a recognised (municipal) sewage treatment facility. • The water collected from wash basins and showers (grey water), should not be left standing for long periods of time as this promotes mosquito breeding as well as parasite and bacterial proliferation. Grey water should be recycled: <ul style="list-style-type: none"> – Used for dust suppression; – Used to water a vegetable garden, or to support a small nursery; – Used to clean equipment. • If grey water will not be recycled it should be removed along with the black water on a regular basis.
General waste	<ul style="list-style-type: none"> • The construction site should be kept tidy at all times. All domestic and general construction waste produced on a daily basis should be cleaned and contained daily. • No waste may be buried or burned. • Waste containers (bins) should be emptied regularly and removed from site to a recognised (municipal) waste disposal site. All recyclable waste needs to be taken to the nearest recycling depot. • A sufficient number of separate waste containers (bins) for hazardous and domestic/general waste must be provided on site. These should be clearly marked as such. • Construction labourers should be sensitised to dispose of waste in a responsible manner and not to litter. • No waste may remain on site after the completion of the project

SECTION B: BORROW PITS

ASPECT	MITIGATION MEASURE
Topsoil	The Contractor should adhere to prescribed measures emanating from the borrow-pit investigation and the design for excavations and disposal of spoil material.
Rehabilitation	<ul style="list-style-type: none"> • Upon completion of the construction phase consultations should be held with the local community regarding the post-construction use of the borrow pits. • In the event that no post-construction uses are requested, all borrow pits need to be rehabilitated as follows: <ul style="list-style-type: none"> – Borrow pits may only be backfilled with clean or inert fill. No material of hazardous nature (e.g. sand removed with an oil spill) may be dumped as backfill. – Rehabilitated borrow pits need to match the contours of the existing landscape. – Also take note of drainage channels in the vicinity of the borrow pit. The rehabilitated area should not be higher (or lower) than a drainage channel. This ensures the efficiency of revegetation reduces the chances of potential erosion. – Topsoil is to be spread across borrow pit areas evenly. – Deep ripping is required, not just simple scarification, so as to enable rip lines to hold water after heavy rainfall. – Ripping should be done along slopes, not up and down a slope which could lead to enhanced erosion. – Rehabilitated borrow pits needs to remain fenced off after the decommissioning of the project to prevent livestock from denuding the newly established vegetation on the area.

SECTION C: HEALTH AND SAFETY

ASPECT	MITIGATION MEASURE
HIV/AIDS and TB training	The Contractor should approach the Ministry of Health and Social Services to co-opt a health officer to facilitate HIV/AIDS and TB education programmes periodically on site during the construction phase.
Road Safety	<ul style="list-style-type: none"> • Demarcate roads clearly. • Off-road driving should not be allowed. • All vehicles that transport materials to and from the site must be road worthy. • Drivers that transport materials should have a valid driver's license and should adhere to all traffic rules. • Loads upon vehicles should be properly secured to avoid items falling off the vehicle.
Safety Around Excavated and Work Areas	<ul style="list-style-type: none"> • Excavations should be left open for an absolute minimum time. • Excavate short lengths of trenches and box areas for services or foundations in such a way that the trench will not be left unattended for more than 24 hours. • Demarcate the following areas with danger tape: <ul style="list-style-type: none"> – All excavation works; – Soil and other building material stockpiles; and – Temporary waste stockpiles • Provide additional warning signage in areas of movement and in "no personnel" areas where workers are not active. • Borrow pits are to be fenced off with steel wire fencing. • Work areas must be set out and isolated with danger tape on a daily basis. • All building materials and equipment are to be stored only within set out and demarcated work areas. • Only construction personnel will be allowed within these work areas. • 2 fire extinguishers should be available at fuel storage area and cooking facilities (in the event that migrant workers reside near the construction site) • Comply with all mitigation measures laid out in Section A (Waste Management mitigation details)
Ablutions	<ul style="list-style-type: none"> • Separate ablutions (toilet and shower) should be available for men and women and should clearly be indicated as such. • Portable toilets (i.e. easily transportable) should be available at every construction site: <ul style="list-style-type: none"> – 1 toilet for every 25 females. – 1 toilet for every 50 males. – Sewage waste needs to be removed on a regular basis to an approved (municipal) sewage disposal site. Alternatively, pump it into sealable containers and store it until it can be removed. – Workers responsible for cleaning the toilets should be provided with latex gloves and masks.

ASPECT	MITIGATION MEASURE
Open fires	<ul style="list-style-type: none"> • No open fires may be made anywhere on site. • No wood may be collected within or near the project area. The Contractor must supply wood (or other fuel) for cooking or heating purposes.
General	<ul style="list-style-type: none"> • Dust protection masks should be provided to workers if they complain about dust. • Potable water should be provided to workers. • No person should be allowed to smoke close to fuel storage facilities or portable toilets (if toilets are chemical toilets – the chemicals are flammable). • No workers should be allowed to drink alcohol during work hours. • No workers should be allowed on site if under the influence of alcohol.

SECTION D: DUST AND NOISE

ASPECT	MITIGATION MEASURE
Dust	A watering truck should be used on gravel roads with the most heavy vehicle movement especially during dry and windy conditions
Noise	Work hours should be restricted to between 08h00 and 17h00 where construction involving the use of heavy equipment, power tools and the movement of heavy vehicles is less than 500 m from residential areas.

SECTION E: ENVIRONMENTAL TRAINING AND AWARENESS

ASPECT	MITIGATION MEASURE
Environmental Induction (Training)	<p>All construction workers are to undergo environmental induction (training) which should include as a minimum the following:</p> <ul style="list-style-type: none">• Explanation of the importance of complying with the EMP.• Discussion of the potential environmental impacts of construction activities.• Employees' roles and responsibilities, including emergency preparedness.• Explanation of the mitigation measures that must be implemented when particular work groups carry out their respective activities.• Explanation of the specific mitigation measures within this EMP especially unfamiliar provisions.

SECTION F: ENVIRONMENTAL CONSERVATION

ASPECT	MITIGATION MEASURE
Conservation of vegetation	<ul style="list-style-type: none"> • The layout and building design should incorporate large indigenous trees. • The Contractor should compile a Tree Management Plan which should include the following as a minimum: <ul style="list-style-type: none"> – Trees with a trunk size of 150 mm and bigger should be surveyed, marked with paint (readily visible) and protected; – Trees with a trunk size of 150mm and bigger, which are impossible to conserve, need to be identified and their location recorded on a map; – The Contractor should apply to the nearest forestry office for a permit remove these trees. – A list should be compiled of all trees to be removed detailing the erf on which they are located, the species as well as which trees will be planted to replace these. The nursery where these trees will be sourced from should also be included; – Each tree that is removed needs to be replaced after construction (see Appendix A for list of recommended trees); – Some of these trees can be obtained at the nearest forestry office or at a commercial nursery (most of these are located in Windhoek). The forestry officers can also direct to nearby nurseries where additional trees may be bought. • Only a limited width +/- 5 m on the side of the road may be partially cleared of vegetation.
Materials camp and lay-down areas	<p>Suitable locations for the materials camp and lay-down areas should be identified with the assistance of the ER and the following should be considered in selecting these sites:</p> <ul style="list-style-type: none"> • The areas designated for the proposed services infrastructure should be used as far possible • Second choice should be degraded land • Avoid sensitive areas (e.g. protected archaeological sites, rivers or drainage lines).

SECTION G: EMPLOYMENT/RECRUITMENT

ASPECT	MITIGATION MEASURE
Legislation	Adhere to the legal provisions in the Labour Act (see Table 1) for the recruitment of labour (target percentages for gender balance, optimal use of local labour and SME's, etc) in the Contract.
Recruitment	<p>The Contractor should compile a formal recruitment process including the following provisions as a minimum:</p> <ul style="list-style-type: none"> • The OTC and local headman should assist with the recruitment process. • Recruitment should not take place at construction sites. • Ensure that all sub-contractors are aware of recommended recruitment procedures and discourage any recruitment of labour outside the agreed upon process. • Contractors should give preference in terms of recruitment of sub-contractors and individual labourers to those from Okakarara and only then look to surrounding towns. • Clearly explain to all job-seekers the terms and conditions of their respective employment contract (e.g. period of employment etc.) – make use of interpreters when necessary.

SECTION H: STAKEHOLDER COMMUNICATION

ASPECT	MITIGATION MEASURE
Communication plan	<p>The Contractor or appointed private property developer (if applicable) should draft a Communication Plan, which should outline as a minimum the following:</p> <ul style="list-style-type: none"> • How stakeholders, who require ongoing communication for the duration of the construction period, will be identified and recorded and who will manage and update these records; • How these stakeholders will be consulted on an ongoing basis; • Make provision for grievance mechanisms – i.e. how concerns can/ will be lodged/ recorded and how feedback will be delivered as well as further steps of arbitration in the even feedback is deemed unsatisfactory.
General communication matters	<ul style="list-style-type: none"> • The ER in collaboration with the appointed private property developer (if applicable) must appoint an ECO to liaise between the Contractor, stakeholders, Developer, and consultants. The appointed Contractor shall appoint a person from the construction team to take responsibility for the implementation for all provisions of this EMP. • The Contractor shall at every site meeting report on the status of the implementation of all provisions of the EMP. • The Contractor should implement the environmental awareness training as stipulated in Section E. • The Contractor must list the stakeholders of the project and their contact details with whom ongoing communication would be required for duration of the contract. This list, together with the Communication Plan must be agreed upon and given to the ER before construction commences. • The Communication Plan, once agreed upon by the Developer, shall be binding. • All communication with the stakeholders must take place through the ECO. • A copy of the EMP must be available at the site office and should be accessible to all stakeholders • Key representatives from the above mentioned list need to be invited to attend monthly site meetings to raise any concerns and issues regarding project progress. • The Contractor should liaise with the Developer regarding all issues related to community consultation and negotiation before construction commences. • A procedure should be put in place to ensure that concerns raised have been followed-up and addressed. • All people on the stakeholders list should be informed about the availability of the complaints register in writing by the ER prior to the commencement of construction activities.

SECTION I: SOCIO-ECONOMIC AND MISCELLANEOUS

ASPECT	MITIGATION MEASURE
Archaeology	<ul style="list-style-type: none"> • Should a heritage site or archaeological site be uncovered or discovered during the construction phase of the project, a “chance find” procedure should be applied in the order they appear below: <ul style="list-style-type: none"> – If operating machinery or equipment stop work; – Demarcate the site with danger tape; – Determine GPS position if possible; – Report findings to foreman; – Report findings, site location and actions taken to superintendent; – Cease any works in immediate vicinity; – Visit site and determine whether work can proceed without damage to findings; – Determine and demarcate exclusion boundary; – Site location and details to be added to the project's Geographic Information System (GIS) for field confirmation by archaeologist; – Inspect site and confirm addition to project GIS; – Advise the National Heritage Council (NHC) and request written permission to remove findings from work area; and – Recovery, packaging and labelling of findings for transfer to National Museum. • Should human remains be found, the following actions will be required: <ul style="list-style-type: none"> – Apply the chance find procedure as described above; – Schedule a field inspection with an archaeologist to confirm that remains are human; – Advise and liaise with the NHC and Police; and – Remains will be recovered and removed either to the National Museum or the National Forensic Laboratory.

9 OPERATION AND MAINTENANCE PHASE

The following mitigation measures should be complied with and carried out during any maintenance works associated with the services infrastructure within Portions A, B, C, D and 6.

Table 6: Operation and maintenance phase mitigation measures

ASPECT	MITIGATION MEASURE
EMP implementation	All Portions: <ul style="list-style-type: none"> If any construction is to be conducted as part of maintenance works for the services infrastructure within Portions A, B, C, D and 6 please refer to the construction mitigation measures of the Townships EMP (Section 8).
Sewage pipelines	Regular maintenance and monitoring of sewage pipelines and leakages should be undertaken to detect and prevent water contamination.
Post-construction usage	Borrow pits to be utilised post-construction should adhere to the same topsoil and rehabilitation measures outlined within construction mitigation measures of this EMP (Section 8) above.
Post-construction environmental training and awareness	All contractors appointed for maintenance work on the respective services infrastructure must ensure that all personnel are aware of necessary health, safety and environmental considerations applicable to their respective work.
Monitoring	The OTC should develop a debt monitoring and collection system to address the potential impacts residents defaulting on water and electricity bills.

APPENDIX A: LIST OF PERMITTED INDIGENOUS TREES TO PLANT

COMMON NAME	SCIENTIFIC NAME
Camel Thorn Tree	<i>Acacia erioloba</i>
Knob Thorn Tree	<i>Acacia nigrescens</i>
Paper Bark Tree	<i>Acacia sieberiana</i>
Umbrella Thorn Tree	<i>Acacia tortilis</i>
Worm-cure Tree	<i>Albizia anthelmintica</i>
Leadwood Tree	<i>Combretum imberbe</i>
Ana Tree	<i>Faidherbia albida</i>
Kalahari Omupanda Tree	<i>Philenoptera nelsii</i>
Karee Tree	<i>Searsia lancea</i>
Buffalo-thorn Tree	<i>Ziziphus mucronata</i>