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FLIMIEDA X3
Ref NWP/EIA/54/2020
City of Matlosana Municipality
North West Province

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1 INTRODUCTION

The purpose of an Environmental Management Programme (EMPr) is to guide the planning and design, construction and operational phases of the development. The EMPr should be developed in parallel with the planning and design phase, which enables environmental guidelines and criteria to be incorporated into the detailed design. This is done to eliminate or mitigate the various possible risks to the environment and its surrounding inhabitants during the planning and pre-construction phase. And it will subsequently ensure that minimal damage will occur to these areas during the construction and operational phases of a project.

2 PHASES, ROLES & RESPONSIBILITIES

2.1 Phases of the Project

The point of departure for any EMPr is to take a pro-active route by addressing and minimising any potentially significant problem before it occurs. In particular this EMPr deals with the following phases:

2.1.1 Planning or Design Phase

It is essential that possible problematic situations be eliminated or mitigated during the planning phase, to ensure that contingency plans are prepared for any possible accidental situation that may arise during the construction phase. By having these contingency plans in order before construction starts it will limit any further potentially detrimental impacts to the environment and its surrounding inhabitants.

2.1.2 Construction Phase

The majority of possible impacts on a site would occur during the construction phase, and most of them will have immediate effect (e.g. dust pollution, fuel spillage). It is therefore vital that the site is monitored on a continual basis during this phase, as it would be possible to identify and correct these impacts as they occur, thus minimising their possible impact.

2.1.3 Operational Phase

By being pro-active during the design and construction phases, potentially harmful impacts originating in the operational phase will be minimised or eliminated. For the proposed development the following aspects are important during operations and is more thoroughly addressed under Items as indicated:

- Waste management
- Storm water management
- Noise
- Traffic
- Operational hours
- Visual
- Safety and security

2.1.4 Decommissioning Phase

Thoughtful design, thorough monitoring and strict adherence to the EMPr during the construction and operational phases will ensure that the decommissioning phase (if and when applicable) will be done efficiently and with minimal damage to the bio-physical and social environments.

2.2 Roles and Responsibilities

Various role players have a range of responsibilities to perform during the different phases of a project:

2.2.1 Contract Manager (CM) (Developer Representative)

- The CM will be responsible for overseeing the contract from initiation to completion of construction on the site
- The CM will appoint a team of contractors, which will be responsible for the construction of the entire project
- The CM will be responsible for ensuring that the development is implemented according to the requirements as set out in the EMPr
- The CM should ensure that sufficient resources are available to the other role players to efficiently perform their tasks in terms of the EMPr
- The CM must appoint an independent ECO to ensure strict adherence to the EMPr

2.2.2 Architects (Arch)

Only architects approved by the CM will be allowed to work on the project and will oversee the individual contracts between the owners of the entire site or portions thereof and the contractors.

2.2.3 Engineer (Eng)

An engineer act as a direct, on-site resource for all technical aspects related to the development. He is available on the construction site at all times, overseeing all phases of the construction activities.

2.2.4 Environmental Control Officer (ECO)

The ECO will be appointed at the start of the construction phase and is mandated to do the following:

- Ensure that all contractors/subcontractors/employees are fully aware of their environmental responsibilities. This will take the form of an initial environmental awareness-training program in which requirements of this document will be explained
- Any damage to the environment must be repaired as soon as possible after consultation between the ECO, Consulting Engineer and Contractor
- The ECO shall monitor their actions to ensure that the developer staff and/or contractor are adhering to all stipulations of the EMPr

- The ECO shall be responsible for monitoring the construction activities throughout the project by means of site visits and meetings. This should be documented as part of the site meeting minutes
- The ECO must sign off that the PM certify that they shall ensure that all clean-up and rehabilitation or any remedial action required, are completed prior to transfer of properties
- A post construction environmental audit is to be conducted to ensure that all conditions in the EMPr have been adhered to

2.2.5 Community Liaison Officer (CLO)

Where necessary / required a representative of the community, as nominated by the community, will be the CLO and has the role of representing the community and managing all communication between the ECO, the Contractor and the community (I&APs). (The details of the CLO are to be forwarded to the Ward Councillor for the area.)

3 IMPLEMENTATION AND MONITORING

3.1 Auditing/Inspections

- The appointed ECO on a regular basis, and also ad hoc basis will inspect the site where necessary
- The CM as well as the contractor's representative will accompany the ECO, on-site inspections
- The contractor will use the formats presented in this EMPr to report to the CM as to the compliance to this document

When, in the opinion of the ECO, a construction activity will result in environmental damage, the ECO will issue instructions to the CM, who will in turn order the Contractor to halt the activity. Spot fines or penalties may be levied for non-compliance.

3.2 Methods Statements

Methods statements from the Principal contractor and or subcontractor – where applicable - will be required for specific sensitive actions on request of the authorities or ECO. All method statements will form part of the EMPr documentation and are subject to all terms and conditions contained within the EMPr document. For each instance wherein it is requested that the contractor submit a method statement to the satisfaction of the ECO, the format should clearly indicate the following:

- What – a brief description of the work to be undertaken
- How – a detailed description of the process of work, methods and materials
- Where – a description / sketch map of the locality of work
- When – the sequencing (phases) of actions with commencement date and completion date estimates

The contractor must submit the method statement before any particular construction activity is due to start. Work may not commence until the method statement has been approved by the ECO.

3.3 Record Keeping

All records related to the implementation of this management plan (e.g. site instruction book, ECO diary, methods statements etc.) must be kept together in an office where it is safe. Records should be kept for two years and at any time be available for scrutiny by any relevant authority.

4 STANDARDS

- The ECO will keep written and photographic records of the site and its surroundings before, after and during construction on the site
- The Contractor will keep records of construction activities, instructions received from the ECO and CM concerning environmental matters
- The ECO will keep records of cases of non-compliance and remedial actions taken
- Where no quantitative standards are applicable, visual standards will apply
- The contractor will rehabilitate the site to a condition acceptable to the ECO, and respond timeously to any complaints and instructions regarding construction activities

5 EMPr OBJECTIVES

This EMPr must be used during the pre-construction, construction and operational phases of the proposed project.

The objectives of this plan are to:

- Ensure all environmental safeguards are carried out correctly
- Manage site activities effectively and coordinate with other trades
- Minimise adverse impacts on the environment
- Ensure that environmental mitigation measures are in place from the start of the project
- Minimise disruption to fauna and flora
- Monitor the project

6 EMPr CONTEXT AND ENVIRONMENTAL AUTHORISATION CONDITIONS

This EMPr fits into the overall planning process of the project and should be implemented by the developer as soon as the authorities have approved it. A copy of the EMPr should always be available on site. All contractors and sub-contractors are to be familiar with the EMPr and its contents.

7 LEGISLATION

The EMPr is compiled in order to comply with the following legislation.

Table 1: Legislation

Legislation	Sections	Relates to
The Constitution (No 108 of 1996)	Chapter 2	Bill of Rights
	Section 24	Environmental rights.
National Environmental Management Act (No 107 of 1998 [as amended])	Section 2	Defines the strategic environmental management goals and objectives of the government. Applies through-out the Republic to the actions of all organs of state that may significantly affect the environment.
	Section 24	Provides for the prohibition, restriction and control of activities which are likely to have a detrimental effect on the environment.
	Section 28	The developer has a general duty to care for the environment and to institute such measures as may be needed to demonstrate such care.
Environment Conservation Act (No 73 of 1989) and regulations	Sections 19 and 19A	Prevention of littering by employees and subcontractors during construction and the maintenance phases of the proposed project
National Heritage Resources Act (No 25 of 1999) and regulations	Section 32	No person may, without a permit issued by the responsible heritage resources authority destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or paleontological site.
	Section 34	No person may, without a permit issued by the South African Heritage Resource Agency (SAHRA) or a provincial heritage resources authority destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority. Grave is widely defined in the Act to include the contents, headstone or other marker of such a place, and any other structure on or associated with such place.
National Environmental Management Biodiversity Act (Act No. 10 of 2004)		Provide for the protection of species and ecosystems that warrant national protection and the sustainable use of indigenous biological resources.
Occupational Health and Safety Act (No 85 of 1993)	Section 8	Control of dust
	Section 9	Control of noise
National Water Act (No 36 of 1998) and regulations	Section 19	General duties of employers to their employees
	Section 20	General duties of employers and self employed persons to persons other than their employees
	Section 21	A Water Use License Application is required for construction activities within any 1:100 year flood lines
National Road Traffic Act (No 93 of 1996)		Road safety
Town Planning and Townships Ordinance 15 of 1986		Town Planning
SANS 10103 (Noise Regulations)		The measurement and rating of environmental noise with respect to annoyance and to speech communication

8 PROJECT OVERVIEW

Flimieda X3 is on Portions 127 and 128 of the Farm Elandsheuvel 402-IP in Klerksdorp, City of Matlosana. The application site is situated north of Chris Hani Road (R30), west of Von Wielligh Avenue, in the north-west of Klerksdorp.

All listed and specified activities triggered and being applied for

1. The clearance of an area of twenty hectares or more of indigenous vegetation (Listing Notice 2, Activity No. 15 of the 2014 EIA Regulations as amended).
2. The development of – (ii) infrastructure or structures with a physical footprint of 100 square metres or more; where such development occurs
 - a. within a water course; or (c) if no development setback line exists, within 32 metres of a water course, measured from the edge of a water course (Listing Notice 1, Activity No. 12ii (a&c) of the 2014 EIA Regulations as amended).
3. The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grid, pebbles or rock of more than 10 m³ from a water course (Listing Notice 1, Activity No. 19 of the 2014 EIA Regulations as amended).
4. Residential, mixed, retail, commercial, industrial or institutional development where such land was used for agriculture on or after 1 April 1998 where such development will occur inside an urban area, when the total land to be developed is bigger than 5 hectares (Listing Notice 1, Activity No. 28ii of the 2014 EIA Regulations as amended).
5. The clearance of an area of 300 square metres or more of indigenous vegetation within critical biodiversity areas identified in bioregional plans (Listing Notice 3 Activity No. 12(h)iv of the 2014 EIA Regulations as amended).
6. The development of a road wider than 4 metres with a reserve less than 13,5 metres. North West: (iv) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority (Listing Notice 3 Activity No. 4(iv)).

Project type and description of the activity

The activity comprises township establishment consisting of a mixed land use model with residential, business, institutional and open space uses (Refer to *Appendix A1*).

A mixed-use development is planned which will comprise of ± 2616 residential erven, ± 6 low-income housing erven (BMG & CRU), three primary schools, two secondary schools, a college, an old age home, a medical centre and 2 clinics, and business erven.

Total property size: 182.5314 hectares.

Refer to the land use table below for more detailed information.

LEGEND		LEGENDE		
LAND USE/GRONDGEBRUIKE		Number Erven Aantal Erwe	Area in Ha Area in Ha	% of Area % van Area
Residential (300m ² Erven)		1667	53,0387	28,0573
Residential (400m ² Erven)		949	40,9260	22,4213
BMG		3	6,0909	3,3368
CAU		3	6,0892	3,3360
Business / Besigheid		10	5,0698	2,7775
Church / Kerk		6	1,0293	0,5639
Creche		10	1,3995	0,7667
Primary School		3	8,3208	4,5586
Secondary School		2	8,9412	4,8984
College		1	1,6245	0,8900
Clinic		2	0,2726	0,1493
Medical Centre		1	0,5744	0,3147
House		2	4,6950	2,5722
Taxi Rank		3	0,5766	0,3159
Old Age Home		1	3,1057	1,7015
Post Office/Police/Fire Station/Library		4	0,7679	0,4207
Community Hall		1	0,3805	0,2085
Recreational		1	1,6182	0,8855
Park		2	38,0106	20,8241
TOTAL/TOTAAL		2671	182,5314	100,0000

Table 2: Land Uses

9 PROJECT LOCALITY

Flimieda X3 on Portions 127 and 128 of the Farm Elandsheuvel 402-IP in Klerksdorp, City of Matlosana. The application site is situated north of Chris Hani Road (R30), west of Von Wielligh Avenue, in the north-west of Klerksdorp.

21 Digit Surveyor General codes

TOIP00000000040200127

TOIP00000000040200128

Physical address

Von Wielligh Street, Flimieda, Klerksdorp.

Coordinates of the centre of the activity (Hartebeesthoek 94, WGS84)

26°49'27.08" South;

26°38'26.39" East

(Project indicated on the Site Location maps below).



9 February 2022

Legend

- | | | | |
|--|---------------------------------------|--|--------------|
| | Site Area | | Public Place |
| | EIA Application Development Footprint | | Erven |
| | EIA Application Site | | Farm Portion |
| | National Jurisdiction Area | | Farm |
| | | | Agri Holding |

0 1.25 2.5 km
 Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGIS, (c) OpenStreetMap contributors, and the GIS User Community

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Figure 1: Locality map DEA Screening Tool



Figure 2: Study area location (Google Earth)

11 RECEIVING ENVIRONMENT

The Site sensitivity assessment, conducted to inform the layout options, took a number of issues into consideration. These include the terrestrial and the aquatic ecology of the site and immediate surrounding area; the conservation status of the vegetation type in which the study site is situated, which in this case is endangered (EN); the presence of pristine veldtypes; the presence of red data fauna and flora species; and the presence of ideal habitats for priority species (which include, but are not limited to red data species), the presence of heritage resources etc.

Vegetation at the site ranges from transformed and degraded to a fair condition (albeit secondary succession took place at much of the site in the past owing to cultivation).

The terrestrial vegetation mainly consists of grassland, extensive clumps of alien invasive *Eucalyptus camaldulensis* trees and some indigenous trees which include *Vachellia karroo*, *Searsia lancea* and *Vachellia erioloba*. The indigenous shrub *Asparagus laricus* occurs at the site. Indigenous grass species include *Aristida congesta*, *Cynodon dactylon*, *Eragrostis lehmanianna*, *Eragrostis superba*, *Pogonarthria squarrosa*, *Heteropogon contortus*, *Melinis repens*, *Tragus berteronianus*, *Chloris virgata* and *Panicum coloratum*. Dwarf shrubs such as *Felicia muricata* and *Pentzia globosa* are conspicuous at some areas at the site. Indigenous forb species include *Cleome maculata*, *Gazania krebsiana*, *Bulbine narcissifolia*, *Barleria macrostegia*, *Berkheya onopordifolia*, *Geigeria ornativa* and *Hilliardiella oligocephala*. The herbaceous shrub *Gomphocarpus fruticosus* is noticeable at the site.

A number of alien invasive weed species are present in particular at disturbed areas. These alien invasive weeds include *Alternanthera pungens*, *Argemone ochroleuca*, *Gomphrena celosioides*,

Schkuhria pinnata, Tagetes minuta, Conyza bonariensis, Datura ferox, Datura stramonium, Xanthium spinosum, Verbena bonariensis, Verbena aristigera Tagetes minuta, Physalis viscosa and Zinnia peruviana.

Riparian vegetation contains a conspicuous mixture of alien invasive and indigenous tree species. Alien invasive tree species at the riparian zones, including along the in-channel dams include Eucalyptus camaldulensis, Morus alba, Melia azedarach and Sesbania punicea. Exotic Pinus species (pines) are present at the banks of an in-channel dam at the site. Conspicuous indigenous tree species at the riparian zone are Vachellia karroo, Ziziphus mucronata and Searsia lancea. Alien invasive herb species at the riparian zone include Rumex crispus, Oenothera rosea and Cirsium vulgare. Sedges such as Schoenoplectus corymbosus and rushes such as Juncus oxycarpus are present at the riparian zone. The alien invasive grass species Paspalum distichum is conspicuous at the edges of the in-channel dams.

Most of the site has been cultivated (ploughed) some time in the past which has led to secondary succession of much of the grassland in the past. Homesteads, associated gardens, fences and roads are found at the site. Few excavations are also found at the site. The site borders on a tar road and residential areas on its eastern side.

Grassland at the site is represented by the Vaal-Vet Sandy Grassland vegetation type (Gh 10) which is listed as a Threatened Ecosystem, Endangered, according to the National List of Threatened Ecosystems (2011). Most of the site has been cultivated in the past. The scope for the restoration and conservation of natural grassland at the site is small.

No wetlands appear to be present at the site. A small non-perennial river, the Rietgatspruit river, with two in-channel dams are found at the site.

Rocky ridges are absent at the site.

No Threatened or Near Threatened plant or animal species appear to be resident at the site.

One plant species, Vachellia erioloba (Camel Thorn) that is not threatened but listed as Protected tree species occurs at the site. In terms of a part of section 15(1) of the National Forests Act No. 84 of 1998, no person may cut, disturb, damage or destroy any protected tree or possess, collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree, except under a license granted by the Minister. Vachellia erioloba is numerous at some areas at the site. A Camel Thorn Tree Forest or large Camel Thorn trees (>10 m) such as at Kathu and Witsand in the Northern Cape Province, are absent at the site. If the development is approved and it is likely that some Camel Thorn trees (Vachellia erioloba) should be removed, a permit for removal would be imperative, and should be applied for.

The proposed footprint avoids the Vachellia erioloba trees in which case all the individual Vachellia erioloba trees at the site need to be clearly marked and avoided during the development.

There is little scope for most of the site to be part of a corridor of particular conservation importance, excluding the non-perennial river with its in-channel dams and including the buffer zones.

Site is part of the Middle Vaal Water Management Area (WMA 9). The site is not part of a Freshwater Ecosystem Priority Area (FEPA) or wetland cluster.

Ecological sensitivity at the site is medium at the terrestrial areas and medium-high at the watercourse. The non-perennial river (watercourse) is disturbed in some places and modified by in-channel dams, so its medium-high sensitivity is because of its importance as a conservation corridor in the larger area and an important source for waterbirds.

The non-perennial river (Rietgatspruit), in-channel dams, riparian zone and buffer zone (30 m) are excluded from the proposed footprint to conserve of conservation corridor of particular importance.

Continued monitoring and eradication of alien invasive plant species are imperative. It is in particular declared alien invasive species such as *Prosopis glandulosa* (Mesquite), *Melia azedarach* (Syringa) and alien invasive Australian *Acacia* species (Australian wattles) that should not be allowed to establish.

In summary, the site sensitivity is medium and the sensitivity of the non-perennial river (Rietgatspruit), in-channel dams, riparian zone is medium-high. This area is excluded from development and is a No-Go area.

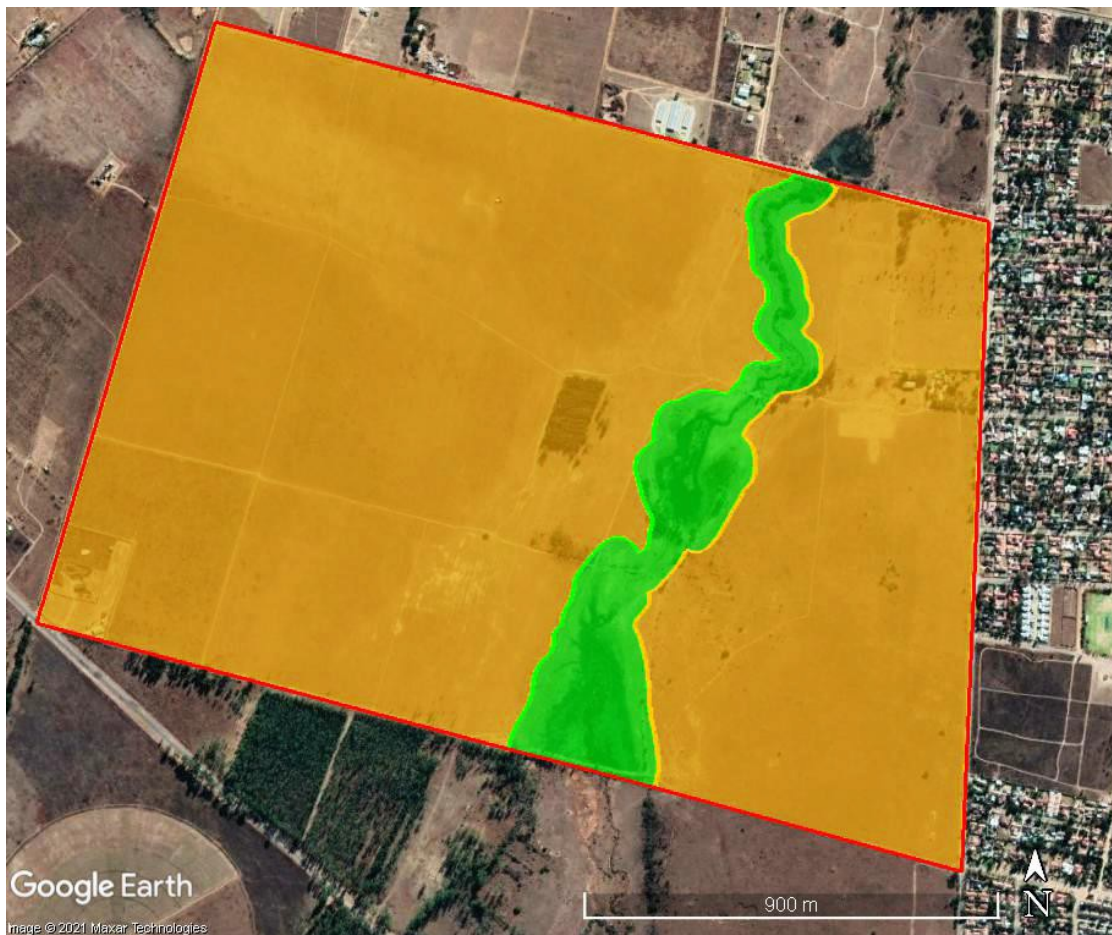


Figure 3: Sensitivity Map

- | | |
|----------------------------|-------------------------|
| Red outline | Boundaries of the site |
| Orange outline and shading | Medium Sensitivity |
| Green outline and shading | Medium-high Sensitivity |

12 LAYOUT

The sensitive areas identified during field investigations are the non-perennial river (Rietgatspruit), in-channel dams and riparian zone. The watercourses, like all watercourses encountered, should be approached as sensitive. These areas were thus demarcated and rated as having a sensitivity rating of High. These areas should ideally be viewed during project planning and development as 'No-Go' zones. The layout options were investigated in terms of the layout for the proposed establishment so as to accommodate the riverine area.

In addition, the flood line was determined and no development are proposed in the 1:100 year flood line area. The 1:100 year flood line area also incorporates the buffer zones as identified by the ecologist. The flood lines are indicated and endorsed by the relevant engineer on the Site Development Plan.

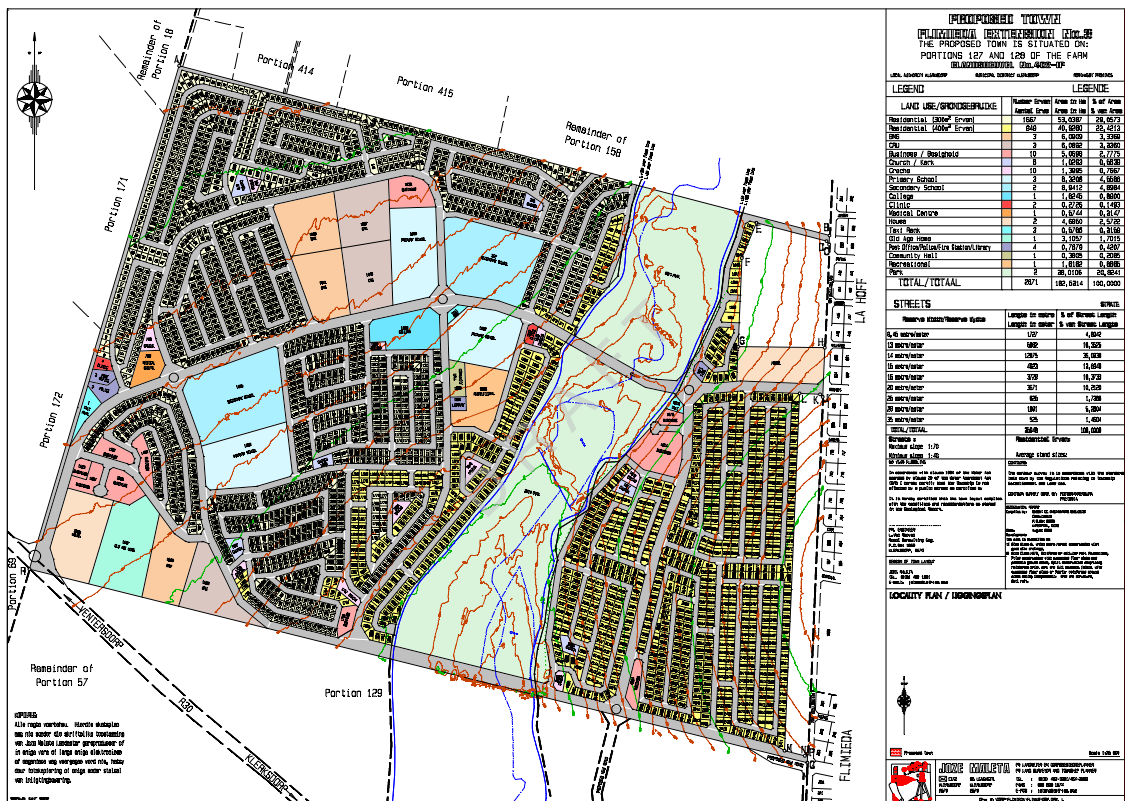


Figure 4: Layout

13 TIMEFRAMES

It is envisaged that the construction period will be concluded and post construction monitoring requirements will be finalised approximately five years after commencement of the activity.

14 ENVIRONMENTAL MANAGEMENT PROGRAMME

Table 3: Environmental Management Programme

Possible Impact	Mitigation measures	Applicable phases				Responsible Person	Frequency	Compliant
		DS	CO	OP	DE			
14.1 Planning								
a) Appointment and duties of ECO	The Developer must appoint an independent ECO who must monitor the contractor's compliance to the EMPr. The developer must provide all contractors with a copy of the EMPr. The priority of the ECO is to maintain the integrity of the development conditions as outlined in the EMPr. The ECO must form part of the project management team and attend all relevant project meetings. Once appointed the ECO details should be included in the EMPr.	✓	✓			DEVELOPER, ECO, CONTRACTOR	Continuous	
b) EMPr	This EMPr must be made binding to the Contractor, as well as sub-contractors and should be included in the tender documentation for the construction contract. The EMPr is also binding to the owner during the operations of the facilities.	✓	✓			DEVELOPER, CONTRACT MANAGER, CONTRACTOR	Once-off	
c) Environmental incidents	The Contractor and Owner must take corrective action as per prescribed procedure, 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.		✓			CONTRACTOR, ECO	Continuous	
d) Flooding, erosion and sedimentation	➤ The stormwater management plan should aim to slow down water flow from hard permeable surfaces, prior to being released to the storm water system.	✓		✓		DEVELOPER, CONTRACT MANAGER		

Possible Impact	Mitigation measures	Applicable phases				Responsible Person	Frequency	Compliant
		DS	CO	OP	DE			
	<ul style="list-style-type: none"> ➤ Stormwater drainage must be in accordance with the Water Research Commission Report, 2012 and the South African Guidelines for Sustainable Drainage Systems. ➤ The storm water designs should include SUDS technologies, such as bio-retention ponds and permeable pavements. ➤ Storm water system must be implemented as per the approved Storm Water Management Plan. 							
e) Service systems	The service systems are to be designed according to the minimum requirements of, and submitted to the Local authority for approval. No construction activities must commence on site prior to obtaining the necessary approval. Underground services should be designed in such a way so as to require minimum maintenance to avoid disturbance of the underground and superficial environment.	✓	✓	✓		CONTRACT MANAGER, ENGINEER, CONTRACTOR		
f) Geology	Founding conditions for individual structures must be confirmed by a qualified geologist. <i>Refer to Geotechnical Report for recommendations.</i>	✓				ENGINEER, GEOLOGIST		
g) Structures	Structures should meet the National Building Regulations.	✓		✓		DEVELOPER, ARCHITECT OWNER		
h) Landscape	<p>The natural features of the site should be managed in a holistic manner.</p> <ul style="list-style-type: none"> ➤ At least 80% of the proposed planting must be indigenous. This includes trees, shrubs, groundcovers and lawn; ➤ It is recommended that indigenous, and as far as possible, endemic trees be encouraged within the proposed development; ➤ The layout of the proposed development needs to consider open space provisioning within the proposed development. Hard landscape elements such as paving and walls need to be softened by vegetative landscaping. ➤ It is recommended to allow for one indigenous tree for every two open parking bays within areas of parking. Trees can be 	✓				DEVELOPER, LANDSCAPE ARCHITECT, ECO		

Possible Impact	Mitigation measures	Applicable phases				Responsible Person	Frequency	Compliant
		DS	CO	OP	DE			
	accommodated within hard landscaped areas by means of formal tree rings.							
i) Crime, safety and security	The Developer must determine which security system should be utilised for the site. Entrance points of the construction road must be secured. A 24-hour guard service must operate in the area and must conduct regular patrols. The intention is that the guards are visible on the streets and not only inside the facility. Loitering must be avoided by clearly indicated signs showing NO JOBS placed around the outside of the site	✓	✓	✓		DEVELOPER, CONTRACTOR		
14.2 Soil								
14.2.1 Compaction								
a) Designated Routes	Designated routes shall be determined for the construction vehicles and designated areas for storage of equipment. These areas shall preferably be already disturbed. The construction camp must be situated on an already disturbed area and approved by the relevant municipal department.	✓	✓			CONTRACT MANAGER, ECO, CONTRACTOR	Once-off	
b) Compacted areas	All areas that are compacted by machinery shall be ripped prior to them being rehabilitated with topsoil and grass seed. The compaction of the soil will be avoided by primarily using areas where existing disturbances exist at a level that precludes vegetation.		✓			CONTRACTOR	Continuous	
c) Access points & route	Clearly mark the site access point and routes on site to be used by construction vehicles and pedestrians.	✓	✓			CONTRACT MANAGER, ECO, CONTRACTOR	Once-off	
d) Vehicular fences	Fence off areas which are off limits to vehicles	✓	✓			ECO, CONTRACTOR	Once-off	
e) Excavated areas	Mark out the areas to be excavated to ensure that only necessary areas	✓	✓			ECO,	Once-off	

Possible Impact	Mitigation measures	Applicable phases				Responsible Person	Frequency	Compliant
		DS	CO	OP	DE			
	are excavated.					CONTRACTOR		
14.2.2 Erosion								
a) Erosion prevention	All surface run-offs shall be managed in such a way so as to ensure erosion of soil does not occur. All surfaces that are susceptible to erosion shall be covered with a suitable vegetative cover as soon as construction is completed. Or where erosion may potentially occur, dissipaters such as gravel beds or straw bales must be installed to prevent erosion.	✓	✓			ENGINEER, ECO, CONTRACTOR	Continuous	
b) Stockpiles	Straw bales or sandbags must be used as a mitigation measure against erosion where needed.	✓	✓			ECO, CONTRACTOR	Once-off	
c) Wet areas	No vehicles what so ever are allowed to move across sensitive areas which could cause erosion scouring and compaction.		✓			CONTRACTOR	Continuous	
d) Swales	Erosion caused by construction methods or unusually heavy rainstorms must be prevented and managed by building retention swales and cut-off swales to direct the water to shallow slow flowing slope.		✓			CONTRACTOR	Continuous	
e) Downhill areas	Straw bales or approved equal should be placed and adequately secured on all downhill locations where erosion may occur to prevent washouts and to retain siltation and topsoil from the site. A supply of straw bales must be kept on site for this purpose.		✓			CONTRACTOR	Continuous	
f) Clearing of large areas outside of construction footprint	Where it is necessary to clear large areas, the clearing activities must be followed by the planting of grass or covering of the surface prior to clearing the area.		✓			CONTRACTOR	Once-off	
g) Clearing on slopes	Where it is necessary to clear slopes, the clearing activities must be followed by the planting of grass or covering of the surface prior to clearing the area.		✓			CONTRACTOR, ECO	Once-off	
h) Clearing footprints	The area being cleared of vegetation for the construction activities must be limited to a minimum.		✓			CONTRACTOR, ECO	Continuous	

Possible Impact	Mitigation measures	Applicable phases				Responsible Person	Frequency	Compliant
		DS	CO	OP	DE			
14.2.3 Topsoil								
a) Stripping of topsoil	The top (200-300mm) layer (as applicable) of all areas to be excavated for the purposes of construction shall be stripped and stockpiled in areas where this material will not be damaged, removed or compacted. This stockpiled material shall be used for the rehabilitation of the site. Weeds appearing on the stockpiled topsoil shall be removed by hand before seeding.	✓	✓			CONTRACTOR	Once-off	
b) Storing	In order to minimize erosion and siltation and disturbance to existing vegetation, it is recommended that stockpiling be done/ equipment be stored in already disturbed/exposed areas.	✓	✓			ECO, CONTRACTOR	Continuous	
c) Mowing of vegetation	Only areas directly affected by construction may be grubbed and stripped of topsoil. The vegetation on the remainder of the construction areas, where possible, may only be mowed short and shall not be removed.		✓			CONTRACTOR	Once-off	
d) Grass component	When the stripping of topsoil takes place, the grass component shall be included in the stripped topsoil. The soil will contain a natural grass seed mixture that may assist in the re-growth of grass once the soil is used for back filling and rehabilitation.		✓			CONTRACTOR	Once-off	
e) Infrastructure	During the laying of pipes or infrastructure (on or adjacent to the site), topsoil shall be kept aside to cover the disturbed areas immediately after such activities are completed. Measures should be taken to ensure that no rocks or any other materials are placed on the top layer of soil.		✓			CONTRACTOR	Continuous	
f) Designated areas	Stockpiling will only be done in designated places where it will not interfere with the natural drainage paths of the environment and must be properly planned according to the construction programme.	✓	✓			ENGINEER, ECO, CONTRACTOR	Continuous	
g) Flood line areas	No stockpiling shall be allowed below the 1:100-year flood line.	✓	✓			ECO, CONTRACTOR	Once-off	

Possible Impact	Mitigation measures	Applicable phases				Responsible Person	Frequency	Compliant
		DS	CO	OP	DE			
h) Stockpile covering	Cover stockpiles and surround downhill sides with a sediment fence to stop materials washing away.		✓			CONTRACTOR	Continuous	
i) Runoff prevention	Care must be taken to prevent the runoff of silt from open soil and stockpiles into the sensitive areas.		✓			CONTRACTOR	Continuous	
j) Removal areas	Remove vegetation only in areas designated during the planning stage.	✓	✓			CONTRACTOR	Once-off	
k) Stockpile footprint	Stockpiles must meet the requirements of the Regulation 28 of the Construction Regulations and Regulation 8 of the General Safety Regulations.		✓			CONTRACTOR	Continuous	
l) Traversing topsoil	No vehicles are allowed to traverse the stockpiled topsoil areas.		✓			CONTRACTOR	Continuous	
14.3 Waste Management								
14.3.1 Construction waste								
	Waste minimisation principles must be applied during the construction and operational phases of the development. Waste should ideally be avoided but where it does exist, it must be removed from site and disposed of at a registered or licensed landfill site for the type of waste produced. All waste streams to be generated must be managed in accordance with the hierarchy of waste management principles. Proof of disposal of waste must be kept on site and made available to the Department upon request.							
a) Planning	Plan the site before starting – for access, deliveries, construction areas, washout area, waste, stockpiles, and chemicals storage. Plan routes for trucks and also vehicles with limited turning ability. Indicate this on site and on maps prior to the event.	✓				CONTRACT MANAGER, ECO, CONTRACTOR	Once-off	
b) Storage	Temporary waste storage points on site shall be determined. These storage points shall be accessible by waste removal trucks and these	✓	✓			CONTRACT MANAGER, ECO,	Once-off	

Possible Impact	Mitigation measures	Applicable phases				Responsible Person	Frequency	Compliant
		DS	CO	OP	DE			
	points should not be located in areas highly visible from the properties of the surrounding land-owners/tenants/in areas. These areas should also be already disturbed. The storage of solid waste on site, until such time that it may be disposed of, must be in the manner acceptable to the relevant Authority.					CONTRACTOR		
c) Waste Plan	Prepare and submit a Waste Management Plan to ECO. Coordinate with other trades on site and nearby businesses for potential reuse or 'waste exchange'. Coordinate with other trades working on site regarding: site management, timing of works and waste management (recycling and reuse potential).	✓				CONSULTANT, ECO, CONTRACTOR	Once-off	
d) Disposal	Solid waste shall be disposed of in a manner approved by the Department of Water and Sanitation (DWS). All solid waste must be removed and transported to a recognised waste disposal site on a weekly basis. Waste disposal certificates must be obtained for all waste disposal.	✓	✓			CONTRACTOR	Continuous	
e) Record keeping	Keep records of waste reuse, recycling and disposal for future reference. Provide information to ECO.		✓			CONTRACTOR	Continuous	
f) Cleaning/ clearing	Avoid the cleaning of the site camp or paved surfaces with soap. All roads should be cleared of any obstruction and should be swept clean with a broom, as to avoid the waste from entering the storm water systems.		✓	✓		CONTRACTOR	Continuous	
g) Waste removal	On completion of works, the contractor shall clear away and remove from the site all construction paint, surplus material, foundations, plumbing and other fixtures of every kind. Areas thus cleared shall be graded and scarified to restore the ground as near as possible to its original profile.			✓		CONTRACTOR	Once-off	

Possible Impact	Mitigation measures	Applicable phases				Responsible Person	Frequency	Compliant
		DS	CO	OP	DE			
14.3.2 Household waste								
a) Storage	Temporary waste storage points on the site should be determined. These storage points should be accessible by waste removal trucks and these points should not be located in ecological sensitive areas /areas highly visible from the properties of the surrounding land-owners/ in areas where the wind direction will carry bad odours across the properties of adjacent landowners.	✓	✓	✓		CONTRACT MANAGER, CONTRACTOR	Once-off	
b) Disposal	No waste materials shall at any stage be disposed of in public areas or adjacent properties, or where the wind direction will carry bad odours across the properties of adjacent tenants or landowners. The piling of any material that could rot and release unpleasant smells into the air will not be permitted. Burning of waste is not permitted.		✓	✓		ECO, CONTRACTOR	Continuous	
c) Recycling	Several waste bins must be provided in offices and domestic areas and clearly marked or colour coded according to industry standards to allow for recycling of waste into <ul style="list-style-type: none"> ➤ Paper ➤ Biodegradable ➤ Glass ➤ Plastics ➤ General 			✓				
d) Waste Bins	The waste bins shall be cleared by approved waste contractor. During municipal strikes special arrangements must be made to have the waste removed via private waste removal services.		✓	✓		CONTRACTOR	Continuous	
14.3.3 Chemical waste								
a) Design	Design the site in such a manner that chemical wastes are not located in	✓		✓		CONTRACT	Once-off	

Possible Impact	Mitigation measures	Applicable phases				Responsible Person	Frequency	Compliant
		DS	CO	OP	DE			
	close proximity to any fire. These areas shall be predetermined and located in areas that are already disturbed. These areas shall not be within 100 m from any 1:100-year flood line or drainage lines. This area should be on a concrete base to avoid any possible seepage into the soil.					MANAGER, CONTRACTOR		
b) Contamination	Cover any wastes that are likely to wash away or contaminate storm water. Build a bund around waste storage area to stop overflow into storm water		✓	✓		CONTRACTOR	Continuous	
	If any soil contamination occurs during the construction phases of the proposed activity, the contaminated soil must be removed to a licensed landfill site and the site must be rehabilitated to the satisfaction of the Department.		✓			CONTRACTOR	Continuous	
	The preparation of building material (e.g. mixing of cement, concrete, sand etc.) must be done on a concrete impermeable surface to avoid seepage into the soil and any riverine areas.		✓			CONTRACTOR	Continuous	
c) Containers	All hazardous waste (fuel, lubricants, chemicals, diesel, etc) shall be placed in specifically designed containers and properly sealed. Should any fuel storage tank be required on site, the Contractor shall ensure that he has complied with the necessary legal requirements for the erection of such tanks.		✓	✓		CONTRACTOR	Continuous	
d) Collection	All containers shall be collected on a weekly basis by certified chemical removal companies.		✓	✓		CONTRACTOR	Continuous	
e) Disposal	All chemical waste shall be disposed of at a certified waste disposal site and proof of this disposal shall be sent to the contractor and ECO.		✓	✓		CONTRACTOR	Continuous	

Possible Impact	Mitigation measures	Applicable phases				Responsible Person	Frequency	Compliant
		DS	CO	OP	DE			
14.4 Fuel, Fuelling and Maintenance								
14.4.1 Fuel storage								
a) Storage	Fuel storage shall be within the construction camp, and within a bunded area with at least 110% of the volume of the amount of fuel stored, as per agreement and approval of the ECO. No storage of any fuel will be allowed on site, other than what is approved by the applicable provincial government department.	✓	✓			ENGINEER, CONTRACTOR	Once-off	
14.4.2 Fuelling								
a) Re-fueling	According to Construction Regulation 25 and General Safety Regulation 4, in designated areas.	✓	✓			ENGINEER, CONTRACTOR	Continuous	
b) Drip trays and spill kits	Drip trays (min 10cm deep) are to be placed under construction vehicles overnight. The drip tray must be able to contain 110% of the total amount/ volume of oil in the vehicle. Spill kits must be available in all vehicles that transport hydrocarbons for dispensing to other vehicles on the 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.		✓			ECO, CONTRACTOR	Continuous	
c) Decontamination	In the event of spills from vehicles, the area should be cleaned immediately using a bioremediation product, such as <i>Petro-Clean TM</i> . The absorbent and soil must be placed in a bin and removed from the site by a certified company and disposed of as a hazardous waste at a licensed commercial facility. No hydrocarbons may escape into the		✓			CONTRACTOR	Continuous	

Possible Impact	Mitigation measures	Applicable phases				Responsible Person	Frequency	Compliant
		DS	CO	OP	DE			
	environment. A spill recovery kit must be on site, along with trained personnel.							
d) Notification	Applicable provincial and local government departments, local municipalities and adjacent landowners must be notified within 24 hours of a potentially hazardous spillage or leak.		✓	✓		ENGINEER, CONTRACTOR		
14.4.3 Maintenance								
a) Design	The maintenance yard and secured storage area will be established as far as is practicable, outside the 1:100-year flood line. The maintenance yard should be indicated on the layout plan of the site.	✓		✓		CONTRACT MANAGER, CONTRACTOR OWNER	Once-off	
b) Maintenance area	The maintenance of vehicles and equipment used for any purpose during the development will take place only in the maintenance yard. Any breakdown in the field requires the presence of a spill treatment team and equipment. This team must prevent and mitigate any spills that occur in this situation.		✓			ENGINEER, ECO, CONTRACTOR	Continuous	
c) Equipment	Equipment used in the development process must be adequately maintained so that during operations it does not spill oil, diesel, fuel, or hydraulic fluid.		✓			ENGINEER, CONTRACTOR	Continuous	
d) Machinery	Machinery or equipment used on the site must not constitute a pollution hazard in respect of the above substances. The main contractor or ECO shall order such equipment to be repaired or withdrawn from use if he or she considers the equipment or machinery to be polluting and irreparable.		✓			ENGINEER, CONTRACTOR	Continuous	
e) Buildings and facilities	Buildings, yards, paving areas, gardens, outside fencing or walls, etc. must be maintained in good standing at all times. Maintenance must be carried out expeditiously and with care to maintain the residential character of the area at all times.	✓	✓	✓		CONTRACTOR OWNER		

Possible Impact	Mitigation measures	Applicable phases				Responsible Person	Frequency	Compliant
		DS	CO	OP	DE			
14.5 Air Pollution								
14.5.1 Dust control								
a) Water dampening	The liberation of dust into the surrounding environment shall be effectively controlled by the use of, <i>inter alia</i> , water spraying and/or other dust-allaying agents, such as dust nets. Regular and effective damping down of working areas (especially during the dry and windy periods) must be carried out to avoid dust pollution that will have a negative impact on the surrounding environment. When necessary, these working areas should be damped down every 3 - 4 hours.		✓	✓		CONTRACTOR	Continuous	
b) Speed of trucks	The speed of haul trucks and other vehicles must be strictly controlled to avoid dangerous conditions and excessive dust.		✓			CONTRACTOR	Continuous	
14.5.2 Fire								
a) Fires on site	A designated area shall be assigned for fire making by the construction workers, so as to ensure that run-away veld fires do not occur. This will reduce air pollution by excessive smoke.	✓	✓			CONTRACTOR	Once-off	
14.5.3 Machinery								
a) Exhaust fumes	Machinery or equipment used on the site must not constitute a pollution hazard in respect of air pollution via excessive exhaust fumes. This shall be inspected regularly by the contractor and rectified immediately.		✓			CONTRACTOR	Continuous	
b) Transporting materials	All vehicles transporting material to and from a site that can be blown off (e.g. soil, rubble, etc.) must be covered with a tarpaulin.		✓			CONTRACTOR	Continuous	

Possible Impact	Mitigation measures	Applicable phases				Responsible Person	Frequency	Compliant
		DS	CO	OP	DE			
14.6 Noise Pollution								
14.6.1 Working hours								
a) Construction working hours	Hours stipulated by Local Municipal bylaw. Approval must be sought for working outside the regulated hours.	✓	✓			CONTRACT MANAGER, ECO, CONTRACTOR	Continuous	
b) Operational working hours	As per HOA guidelines.			✓		OWNER AND MANANGER	Continuous	
14.6.2 Staying on site								
a) Construction workers	Where people stay on site, their actions and activities must be managed to avoid nuisance to adjacent occupants		✓			CONTRACTOR	Continuous	
14.6.3 Noise on site								
a) Noise Regulations	Site workers must comply with the Provincial noise requirements as outlined in Provincial Notice No. 5479 of 1999: Noise Control Regulations. The contractor is required by contract to adhere to SABS 1200 and ISO 9000 safety measures during construction on the entire site. And to fit silencers to frilling and other machinery as required.		✓	✓		CONTRACTOR	Continuous	

Possible Impact	Mitigation measures	Applicable phases				Responsible Person	Frequency	Compliant
		DS	CO	OP	DE			
14.7 Safety and Security								
14.7.1 Safety								
a) Site and crew	The site and crew are to be managed in strict accordance with the Occupational Health and Safety Act (85 of 1993) and the National Building Regulations.		✓	✓		CONTRACTOR	Continuous	
b) Informal settlement	No informal settlement will be allowed on the premises		✓	✓		CONTRACTOR	Continuous	
c) Informal trading	It is the responsibility of the contractor to manage any informal traders on site. If they are allowed, toilets and waste bins must be provided.		✓	✓		CONTRACTOR	Continuous	
d) Dangerous areas	All dangerous areas and deep excavations should be barrier taped to ensure visibility of these areas in compliance with the Occupational Health and Safety Act (85 of 1993). In the case where demolition of buildings can pose a threat to workers or visitors to the site, emergency officers must be summoned.		✓			CONTRACTOR	Continuous	
e) Equipment and materials	The Contractor should ensure that the handling of equipment and materials is supervised and adequately instructed.		✓			CONTRACTOR OWNER	Continuous	
f) Sign boards	Clear sign boards should be erected at the entrance to the site to indicate that a construction site is being entered and that OHSA safety precautions should be followed.		✓			CONTRACTOR OWNER	Continuous	
g) Fire extinguisher	A fire extinguisher should be accessible, and the personnel should receive training in the use of a fire extinguisher. Furthermore, a fire extinguisher must at all times be available wherever welding or similar activities take place and be present on all construction vehicles. A full-time fire prevention team and the associated equipment must be available on site.	✓	✓	✓		CONTRACTOR OWNER	Continuous	
h) Emergency	A list with all the relevant emergency telephone numbers shall be pasted	✓	✓	✓		CONTRACTOR	Continuous	

Possible Impact	Mitigation measures	Applicable phases				Responsible Person	Frequency	Compliant
		DS	CO	OP	DE			
numbers	up in the site office (hospital, fire department, police, ambulance, etc.) for easy access in the event of an accident.					OWNER		
i) Equipment and materials	The Contractor should ensure that the handling of equipment and materials is supervised and adequately instructed.		✓			CONTRACTOR OWNER	Continuous	
14.7.2 Security								
a) Security guards	Security officers will remain on site for the purpose of guarding the equipment.	✓	✓			CONTRACTOR	Continuous	
b) Access control	Access control must be enforced, the site could be checked and a search could be done each night for construction workers. The provincial government departments will be allowed access to site at any time of the day.	✓	✓	✓		CONTRACTOR OWNER	Continuous	
c) Fencing	Fencing is required during the construction phase of the project to demarcate the boundaries of the construction site and work camp. Erection of the fence must occur with minimal impact on the natural environment. The fence will ensure that access to and from the site will be restricted to staff only.		✓			CONTRACTOR	Once-off	
d) Casual access	No casual access to the work camp and the construction site will be allowed.		✓			CONTRACTOR	Continuous	
e) Fence rehabilitation	All negative effects caused by the erection of any temporary fences must be rehabilitated after construction is complete.			✓		CONTRACTOR	Once-off	
14.8 Health								
14.8.1 Chemical Toilets								
a) Number of toilets	One (1) portable chemical toilet for every 30 workers must be established on site (not all in the contractor's camp, but within	✓	✓			CONTRACTOR	Continuous	

Possible Impact	Mitigation measures	Applicable phases				Responsible Person	Frequency	Compliant
		DS	CO	OP	DE			
	reasonable walking distance from where the workers are working).							
b) Location	Chemical toilets shall not be in close proximity to any natural drainage channels. Chemical toilets shall not be within 100 m of any 1:100-year flood line. It is important, however, that toilets be placed in areas where the largest number of workers is located on a daily basis.	✓	✓			ECO, CONTRACTOR	Continuous	
c) Usage	No person is allowed to use any other area than chemical toilets		✓			CONTRACTOR	Continuous	
d) Inspections	Regular inspections shall be carried out to ensure that toilets are kept in a hygienic state.		✓			CONTRACTOR	Continuous	
e) Toilet paper	Toilet paper shall be supplied to all toilets.		✓			CONTRACTOR	Continuous	
f) Cleaning	Toilets shall be cleaned by a certified company on a weekly basis.		✓			CONTRACTOR	Continuous	
g) Locking	Toilets must be secured to the ground so that they cannot be overturned, and have a sufficient locking mechanism operational at all times.		✓			CONTRACTOR	Continuous	
h) Shower facilities	Shower and changing facilities must be erected separate for each sex .					CONTRACTOR	Continuous	
i) Eating areas	Sheltered eating areas must be provided					CONTRACTOR	Continuous	
14.9 Blasting on Site								
a) Authorisation	In cases where blasting is required, an authorisation must be obtained from the local blasting officer at the Local Police station and the Provincial Dept of Minerals and Energy.	✓	✓			CONTRACT MANAGER, ENGINEER, CONTRACTOR		
b) Magazine area	The ECO, Contractor and Safety Officer will earmark a suitable area on site for a temporary magazine for the duration of the construction. This magazine however will only be used to store the daily stock and not for stock to be stored for a long period.	✓	✓			ECO, SAFETY OFFICER, CONTRACTOR	Once-off	
c) Blasting times	Blasting will only take place after confirmation between the ECO and Contractor.		✓			ECO, CONTRACTOR	Continuous	
d) Notification	Blasting shall be limited to specific, pre-agreed periods of the day so as		✓				Continuous	

Possible Impact	Mitigation measures	Applicable phases				Responsible Person	Frequency	Compliant
		DS	CO	OP	DE			
	to minimize disturbance and shall be agreed upon with the ECO. The ECO shall be notified in writing 3 days in advance with a two weekly daily schedule of when blasting operations will take place and where so that he can notify surrounding residents of each blasting event in writing, 24 hours in advance before blasting events will take place.					ECO, CONTRACTOR		
e) Safety precautions for blasting	The National Blasting procedures and regulations must be adhered to.		✓			ECO, CONTRACTOR	Continuous	
14.10 Fauna								
a) Regulations	All activities on site must comply with the regulations of the Animal Protection Act, 1962 and NEMPAA 2003.		✓			CONTRACTOR	Continuous	
b) Sensitive areas	No construction worker activity whatsoever will be allowed outside of the specific construction area.	✓	✓			CONTRACTOR	Continuous	
c) Snaring / hunting	Snaring and hunting of fauna by construction workers on or adjacent to the site are strictly prohibited and the Local Municipality shall prosecute offenders. It should also be a condition of employment that any employees/ workers caught poaching will be dismissed.		✓			CONTRACTOR	Continuous	
d) Training	Workers must be trained on how to deal with fauna species as intentional killing will not be tolerated.		✓			ECO, CONTRACTOR	Continuous	
14.11 Flora								
a) Site inspection	Before any vegetation is removed, a suitably qualified person (i.e. on ECO request of a vegetation specialist) shall inspect the study area for any plant/ grass/ tree species that could be transplanted to other similar/ suitable areas. This includes all Red Data or Protected, or rare plants that may be found during the flora site assessment or during construction operations.	✓	✓	✓		FLORA SPECIALIST, ECO, CONTRACTOR	Once-off	
c) Site access and	Strictly no unauthorised access, land clearing, construction activities,	✓	✓	✓		ECO,	Continuous	

Possible Impact	Mitigation measures	Applicable phases				Responsible Person	Frequency	Compliant
		DS	CO	OP	DE			
circulation	vehicular traffic of any kind, pedestrian traffic or fires will be permitted external of specific construction areas or in sensitive vegetation areas.					CONTRACTOR		
d) Drainage lines	No clearing of vegetation will be allowed within any 1:100 year flood line areas of any stream other than as indicated by the ECO.	✓	✓			ECO, CONTRACTOR	Continuous	
e) Exotic / invader species	All invader or exotic plant species must be removed from the site and disposed of at a landfill site. The National Department of Agriculture, will be consulted during this process.		✓	✓		FLORA SPECIALIST, CONTRACTOR	Continuous	
f) Landscaping	The use of indigenous vegetation should be optimised during the landscaping of the development.	✓	✓	✓		FLORA SPECIALIST, LANDSCAPE ARCHITECT, LANDSCAPE CONTRACTOR	Once-off	
g) Wood harvesting	Wood harvesting of any trees or shrubs inside the protected area or adjacent areas for firewood shall be prohibited and subject to a fine.		✓	✓		CONTRACTOR	Continuous	
h) Retaining flora	On site floral assets and tree clumps shall be identified and retained where possible. Floral assets intended to be retained shall be clearly marked on site and be fenced off until they have been removed.	✓	✓	✓		FLORA SPECIALIST, ECO, CONTRACTOR	Continuous	
i) Street trees	No street trees planted by the Local Municipality may be removed without prior approval by the relevant department.	✓	✓	✓		FLORA SPECIALIST, ECO, CONTRACTOR	Continuous	
k) Vegetation along services	No trees, hedges or other large vegetation types may be planted along or over service pipelines/ areas, due to the risk of damage and for ease of maintenance purposes. Must comply to Local Municipality requirements.	✓	✓	✓		LANDSCAPE ARCHITECT, LANDSCAPE CONTRACTOR, CONTRACTOR	Continuous	

Possible Impact	Mitigation measures	Applicable phases				Responsible Person	Frequency	Compliant
		DS	CO	OP	DE			
l) Sensitive flora	<p>The site contains the Protected Tree species <i>Vachellia erioloba</i> (Camel Thorn). In terms of a part of section 15(1) of the National Forests Act No. 84 of 1998, no person may cut, disturb, damage or destroy any protected tree or possess, collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree, except under a license granted by the Minister.</p> <p>Avoidance of individual <i>Vachellia erioloba</i> trees where practical (Application for permits when <i>Vachellia erioloba</i> trees will be damaged or removed, if the development is approved, is essential).</p>	✓		✓		FLORA SPECIALIST, ECO	Once-off	
14.12 Storm water								
a) Covering of wastes	Cover any wastes that are likely to wash away or contaminate storm water		✓	✓		CONTRACTOR OWNER	Continuous	
b) Bunded area	Build a bund around waste storage area to stop overflow into storm water		✓	✓		CONTRACTOR OWNER	Continuous	
c) Natural flow	Natural storm water must flow freely, either as sheet flow or where necessary in open grass swales, to allow for infiltration and retention. Natural veld grass must be left undisturbed as far as possible, to allow natural drainage.		✓	✓		ENGINEER, CONTRACTOR	Continuous	
d) Piping of flow	Natural storm water must not be piped other than in areas where it runs perpendicularly cross a roadway.		✓	✓		ENGINEER, CONTRACTOR	Continuous	
e) Drainage channels	Drainage channels must be constructed along access roads every 50m to divert runoff during construction period.	✓	✓	✓		ENGINEER, CONTRACTOR	Continuous	

Possible Impact	Mitigation measures	Applicable phases				Responsible Person	Frequency	Compliant
		DS	CO	OP	DE			
f) Energy dissipaters	Depending on design, direction of stormwater run-off, etc. it is possible that a certain amount of erosion control (eg. Gabions along the outer edge of the floodline, etc.) may be required. The idea is to protect the integrity of the watercourse at all costs.		✓	✓		ENGINEER, CONTRACTOR	Once-off	
g) Engineering report	The engineer's service report will also specifically address storm water to the satisfaction of the Local Municipality. This report will only be set up once the development has been approved. This storm water design (as per civil engineers) for all hard surfaces will ensure the proper management and precautionary measures are taken into account.	✓		✓		ENGINEER	Once-off	
h) Vegetated swales	Where feasible the use of vegetated swales should be used to accommodate surface runoff, in order to increase infiltration into the soil. The swales should be vegetated with indigenous, riparian vegetation in order to provide habitat for bird life and other aquatic and semi-aquatic species. Where feasible, the swales should be provided adjacent to the property boundaries.	✓	✓	✓		ENGINEER, ECO, CONTRACTOR	Continuous	
i) Retention ponds	Where feasible the utilisation of retention ponds should be applied. Retention ponds manage storm water runoff to prevent flooding and downstream erosion, and to improve water quality in adjacent water bodies.	✓		✓		ENGINEER	Once-off	
j) Alkaline soils	Where alkaline soils occur and the design of the development permits, swales should be used to infiltrate surface runoff, as this promotes the removal of metals from runoff. Especially runoff from any parking areas should be filtered in this fashion before passing into the underground storm water sewer system.	✓	✓	✓		ENGINEER, CONTRACTOR	Continuous	
k) Design of swales	The cross-section of the swale should be parabolic or trapezoidal in shape with side slopes no steeper than 1:3, to maximise the wetted channel perimeter. It is recommended that the longitudinal slope not exceed 2% where possible and that a maximum slope of 4% be used. Where a 4% slope must be exceeded, check dams should be provided at a minimum interval of 17m. As a rule of thumb the total surface area of	✓		✓		ENGINEER	Once-off	

Possible Impact	Mitigation measures	Applicable phases				Responsible Person	Frequency	Compliant
		DS	CO	OP	DE			
	the swale must be 1% of the area that drains into the swale. The surface of the swale must be carefully constructed, to avoid compaction, which will inhibit dense vegetation growth and effective runoff infiltration. The installation of vegetated filter strips parallel to the top of the channel banks can help to treat sheet flows entering the swale.							
l) Maintenance of swale	Maintenance of the swale should include periodic mowing of the grass (never shorter than the design flow depth of the channel). Bare areas should be re-seeded and debris and blockages regularly removed. Sediment depositions should be regularly removed from the swale, to prevent pollution of the runoff from contaminants contained therein.		✓	✓		CONTRACTOR	Continuous	
m) Hydrological Engineer	Please note that the recommendations for the design of the swales are guidelines only and that the designs of the swales, sedimentation ponds and check dams must be done by a hydrological engineer.	✓		✓		CONTRACTOR	Continuous	
14.13 Traffic Impact								
a) Departmental requirements	All requirements from the provincial roads and traffic departments and the Local Municipality must be adhered to and precautionary measures taken to provide safe and effective traffic management. The applicant must comply with the access arrangements, parking requirements and road upgrades recommended in the Traffic Impact Study. This compliance will be in terms of the Matlosana Local Municipality Bylaws (for applications i.t.o. SPLUMA) or the Section 82 or Section 101 requirements (as applicable for applications i.t.o the Ordinance).	✓		✓		ENGINEER OWNER	Once-off	
b) Delivery trucks	Deliveries by excessive large vehicles vehicles may only take place during weekdays and pre-warning of at least one day prior to delivery must be given to the facility manager to ensure adequate space and manoeuvrability inside the facility and in the adjacent roads.		✓	✓		CONTRACTOR OWNER	Continuous	
c) Site access	The access of abnormal trucks will be investigated by the CM to provide		✓			ENGINEER,	Continuous	

Possible Impact	Mitigation measures	Applicable phases				Responsible Person	Frequency	Compliant
		DS	CO	OP	DE			
	a suitable access route that does not become a nuisance to surrounding residents. Only a specified number of trucks at any one time will be allowed onto the property as agreed to between the CM and the ECO based on the capacity of the site to carry the number of trucks.					CONTRACTOR		
d) Peak traffic hours	Construction vehicles and activities must aim to avoid peak hour traffic times.		✓	✓		CONTRACTOR OWNER	Continuous	
e) Legislation	Access roads and traffic planning will adhere to Provincial and the Local Municipality requirements.	✓				ENGINEER	Once-off	
f) Established tracks	Access and travelling on site must follow current and established tracks only.		✓			CONTRACTOR	Continuous	
14.14 Sensitive Areas								
14.14.1 Rivers / Streams								
a) Flood line area	No activities may be allowed below any 1:100-year flood line area.	✓	✓	✓		CONTRACTOR OWNER	Continuous	
b) Stream	Any stream is a 'no-go' area in terms of movement of people, vehicles and materials.	✓	✓	✓		CONTRACTOR OWNER	Once-off	
c) No dumping	No dumping will be allowed within any drainage areas. No bins shall be located within 50m of these areas.		✓			CONTRACTOR	Continuous	
d) No toilets	No chemical toilets shall be situated within 50m from any natural drainage areas.		✓			CONTRACTOR	Continuous	
e) Surface runoff	All surface runoff shall be managed in such a way as to ensure that erosion of soil does not occur. Depending on design, direction of stormwater run-	✓	✓	✓		ENGINEER, CONTRACTOR	Continuous	

Possible Impact	Mitigation measures	Applicable phases				Responsible Person	Frequency	Compliant
		DS	CO	OP	DE			
	off, etc. it is possible that a certain amount of erosion control (eg. Gabions along the outer edge of the floodline, etc.) may be required. The idea is to protect the integrity of the watercourse at all costs.					OWNER		
f) Vehicle access	No vehicles whatsoever are allowed to move across any flood line areas unless authorised by the DWS, which could cause erosion scouring and compaction.		✓			CONTRACTOR	Continuous	
g) No stockpiling	No topsoil stockpiling, or stockpiling of any other material, shall be allowed below any 1:100-year flood line.		✓			CONTRACTOR	Continuous	
h) Siltation ponds	Where natural drainage channels join up with man-made channels, siltation ponds/ stilling basins shall be implemented in order to allow for the sediments to settle before the water is dispersed into the natural system.	✓	✓	✓		ENGINEER, CONTRACTOR	Continuous	
i) Longitudinal connectivity	No activity is allowed that will impede the longitudinal connectivity of drainage areas, as this will hamper efficiency and flow.	✓	✓			WETLAND SPECIALIST, CONTRACTOR	Continuous	
j) No bathing	No bathing will be allowed in any water body on or adjacent to the site.		✓			CONTRACTOR	Continuous	
k) No washing	No washing of clothes will be allowed in any water body on or adjacent to the site.		✓			CONTRACTOR	Continuous	
l) No taking of water	No taking of water from water bodies for drinking or cooking purposes will be allowed, as potable water should be available on site.		✓			CONTRACTOR	Continuous	
m) No urinating	No urinating will be allowed anywhere on site, as this will result in an immediate fine.		✓			CONTRACTOR	Continuous	
n) Sensitive zones rehabilitation	Post construction rehabilitation of the edges of the development area is required. This would include the re-grassing of denuded and disturbed areas with local species, etc.		✓			WETLAND SPECIALIST, CONTRACTOR	Continuous	

Possible Impact	Mitigation measures	Applicable phases				Responsible Person	Frequency	Compliant
		DS	CO	OP	DE			
14.14.2 Rocky Outcrops – not present on this project								
14.14.3 Heritage / Cultural / Archaeological Sites								
a) Discovery of artefacts	<ul style="list-style-type: none"> The construction teams should be inducted on the significance of archaeological resources that may be encountered during subsurface construction work before they work on the area in order to ensure appropriate treatment and course of action is afforded to any chance finds. If archaeological materials are uncovered, work should cease immediately and the SAHRA be notified and activity should not resume until appropriate management provisions are in place. Should any objects of archaeological remains be found during construction activities, work must immediately stop in that area and the Environmental Control Officer (ECO) must be informed. If any evidence of archaeological sites or remains (eg, remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, marine shell and charcoal/ash concentrations), unmarked human burials, or other categories of heritage resources are found during the proposed activities, SAHRA APM Unit (021 462 4502) must be alerted immediately, and a professional archaeologist, depending on the nature of the finds, must be contacted as soon as possible to inspect the findings. If the newly discovered heritage resources prove to be of archaeological significance, a Phase 2 rescue operation might be necessary. If there are any new heritages resources are discovered during 		✓			CONTRACTOR, HERITAGE SPECIALIST, ECO	Continuous	

Possible Impact	Mitigation measures	Applicable phases				Responsible Person	Frequency	Compliant
		DS	CO	OP	DE			
	<p>construction and operation phases of the proposed development, then a professional archaeologist or palaeontologist, depending on the nature of the finds, must be contracted as soon as possible to inspect the findings at the expense of the developer.</p> <ul style="list-style-type: none"> If the newly discovered heritage resources prove to be of archaeological or palaeontological significance, a Phase 2 rescue operation may be required at the expense of the developer. Mitigation will only be carried out after the archaeologist or palaeontologist obtains a permit in terms of section 35 of the NHRA (Act 25 of 1999). SAHRA APM Unit may be contacted for further details: (Nokukhanya Khumalo/ Phillip Hine 021 202 8654). <p><u>Chance Find Protocol: Monitoring Programme for Palaeontology</u> The following procedure is only required if fossils are seen on the surface and when excavations commence.</p> <ul style="list-style-type: none"> When excavations begin the rocks and must be given a cursory inspection by the environmental officer or designated person. Any fossiliferous material (plants, insects, bone, invertebrates) should be put aside in a suitably protected place. This way the project activities will not be interrupted. Photographs of similar fossils must be provided to the developer to assist in recognizing the fossil plants, vertebrates, invertebrates or trace fossils in the shales and mudstones (for example see Figure 5). This information will be built into the EMP's training and awareness plan and procedures. Photographs of the putative fossils can be sent to the palaeontologist for a preliminary assessment. If there is any possible fossil material found by the developer/environmental officer then the qualified palaeontologist 							

Possible Impact	Mitigation measures	Applicable phases				Responsible Person	Frequency	Compliant
		DS	CO	OP	DE			
	<p>sub-contracted for this project, should visit the site to inspect the selected material and check the dumps where feasible.</p> <ul style="list-style-type: none"> Fossil plants or vertebrates that are considered to be of good quality or scientific interest by the palaeontologist must be removed, catalogued and housed in a suitable institution where they can be made available for further study. Before the fossils are removed from the site a SAHRA permit must be obtained. Annual reports must be submitted to SAHRA as required by the relevant permits. If no good fossil material is recovered then no site inspections by the palaeontologist will be necessary. A final report by the palaeontologist must be sent to SAHRA once the project has been completed and only if there are fossils. If no fossils are found and the excavations have finished then no further monitoring is required. 							
b) Fencing	Any archaeological sites present on site shall be fenced and at least 5 metres around it should be safeguarded from construction and development.	✓	✓			CONTRACTOR	Once-off	
c) Structures older than 60 years	No buildings / structures older than 60 years shall be damaged / demolished, or archaeological artefacts removed, without written authorisation from SAHRA.	✓	✓			CONTRACTOR	Continuous	
d) Burial grounds	Any burial ground or grave found on site will be reported immediately to the Contractor, ECO and Contract Manager. If any unmarked human burials are uncovered and the archaeologist called in to inspect the finds and/or the police find them to be heritage graves, then mitigation may be necessary and the SAHRA Burial Grounds and Graves (BGG) Unit must be contacted for processes to follow (Thingahangwi Tshivase/Mimi Seetelo 072 802 1251).		✓			CONTRACT MANAGER, CONTRACTOR, ECO	Continuous	
e) Suspicious artefacts	The ECO will be notified of any suspicious artefacts prior to it being moved or removed.		✓			CONTRACTOR	Continuous	

Possible Impact	Mitigation measures	Applicable phases				Responsible Person	Frequency	Compliant
		DS	CO	OP	DE			
14.15 Services								
14.15.1 Disruption in services								
a) Informing EC	If any disruption in services to outside portions (electricity, water, sewage) are foreseen the contractor must inform the adjacent land owners and the ECO at least 4 days prior to these activities, to enable the ECO to inform the surrounding land owners of such possible disruptions.		✓			CONTRACTOR	Continuous	
14.15.2 Installation of services								
a) Requirements	The service systems are to be designed according to the minimum requirements of, and submitted to, the Local Authority for approval. Thus no construction activities must commence on site prior to obtaining the necessary approval.	✓	✓			ENGINEER, CONTRACTOR	Once-off	
b) Trenches	Excavate, close and rehabilitate trenches as soon as possible after site services pipes are installed. Avoid open trenches for any extended period of time. This shortens the duration of impacts and improves the recovery of the vegetation. This limitation includes the grubbing of the trench area.		✓			CONTRACTOR	Continuous	
c) Backfill material	All trenching and excavations must be properly backfilled and compacted as per sub clause 5.7.1 of SABS 1200 DB. The backfill material must be less permeable than surrounding soil layers so as to prevent erosion of the sides of trenches.		✓			CONTRACTOR	Continuous	
d) Water pressure from surrounding soil	Caution must be exercised to prevent that the water pressure from the surrounding soil is not greater than that within the pipe, as this may lead		✓			CONTRACTOR	Continuous	

Possible Impact	Mitigation measures	Applicable phases				Responsible Person	Frequency	Compliant
		DS	CO	OP	DE			
	to damage.							
e) Existing storm water channels and other services	Existing storm water channels and services are not to be impacted upon in any way during the course of construction, except when part of the construction scope of works. Any damage repairs shall be for the Contractor's account. No littering or dumping of rubble shall be permitted in the channel and all potential blockages shall be removed immediately. Where necessary these areas should be clearly fenced off with white poles at 5m centres, with blue wire and orange barrier netting.		✓			CONTRACTOR	Continuous	
14.16 Contractor's Site Camp								
a) Establishment of site camp	A work site will be established and maintained for storing construction equipment on a non-sensitive area to be agreed upon by the ECO and contractor. The contractor shall furnish the Engineer on site with a site plan indicating the layout of site offices, facilities, such as chemical toilets, areas for stockpiling of materials and provision of containers		✓			CONTRACTOR, ECO	Once-off	
b) Fencing	The site camp shall be fenced and all materials shall be stored within this camp. All hazardous materials i.e. fuel, polyethylene liners, etc. shall be stored in an appointed area that is fenced off and has restricted access.		✓			CONTRACTOR	Continuous	
c) Camp location	No temporary laydown areas or site offices, etc. may be established within the demarcated 'no-go' zone of the watercourse.		✓			CONTRACTOR	Once-off	
d) Rehabilitation of camp	The area where the camp was established must after the construction period be rehabilitated to guidelines in this document or as otherwise directed by the ECO.		✓			CONTRACTOR, VEGETATION SPECIALIST, ECO	Once-off	
14.17 Environmental Awareness Training								
a) Training	An environmental awareness-training programme must be organized as	✓	✓			CONTRACTOR,	Once-off	

Possible Impact	Mitigation measures	Applicable phases				Responsible Person	Frequency	Compliant
		DS	CO	OP	DE			
programme	part of the EMPr to ensure that each employee knows his/her responsibilities regarding the EMPr and the environment in general. Attendance certificates must be issued. Additional training as required, i.e. encounters with Red Data or other fauna should be arranged and provided.					ECO		
b) Appropriate activities	The employees, construction workers and maintenance crews will receive instruction in the appropriate activities that could take place among the natural resources of the area.		✓			ECO	Once-off	
14.18 Rehabilitation & Landscaping								
a) Landscaping	The use of indigenous vegetation should be optimised during the landscaping of the development. Landscaping should enhance the aesthetic appeal of the development/ mitigate the visual impact as far as possible.	✓				LANDSCAPE ARCHITECT	Once-off	
b) Compacted areas	All compacted areas (including backfilled trenches) should be ripped prior to them being rehabilitated.		✓			CONTRACTOR	Continuous	
c) Reseeding	Stored topsoil and reseeded must be used to rehabilitate all open soil areas following construction activities. Any proclaimed weed or alien invader plants shall be cleared by hand before seeding. All rehabilitated areas must be maintained and irrigated as required to ensure sufficient vegetation coverage. Re-seeding may be required if sufficient coverage has not been achieved after 6 months and shall be at the Contractor' expense.		✓			LANDSCAPE ARCHITECT, CONTRACTOR	Once-off	
d) Timeframe	Rehabilitation/ landscaping is to be done immediately after the involved works are completed.		✓			CONTRACTOR	Once-off	
e) Rehabilitation by Sub-contractors	The Contractor is responsible for the actions and works of the sub-contractors and is required to complete the rehabilitation work if the sub-contractor fails to do so. Payment may be withheld from the sub-		✓			CONTRACTOR	Continuous	

Possible Impact	Mitigation measures	Applicable phases				Responsible Person	Frequency	Compliant
		DS	CO	OP	DE			
	contractor in the event that the work must be completed by the main contractor.							
f) Completion of work	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.		✓			CONTRACTOR	Once-off	
g) Cement mixing	Cement mixing shall be done only at specifically selected areas within the construction sites. The preparation of building material (e.g. mixing of cement, concrete, sand etc.) must be done on a concrete impermeable surface to avoid seepage into the soil and riverine areas. After construction activities ended the cement shall be crushed and removed from the site. This mixing area shall then be ripped and rehabilitated.		✓			CONTRACTOR	Continuous	
h) Natural features	The natural features of the site should be managed in a holistic manner.	✓				LANDSCAPE ARCHITECT	Continuous	
14.19 Advertising								
a) Design	A graphic design of the advertisement will be subject to the local bylaws and the approval of the local municipality.	✓				ARCHITECT, CONTRACTOR	Once-off	
b) Requirements	Must meet local municipal requirements. Advertisements will not obstruct traffic view, movement of pedestrians, cause visual pollution or appear to be unsightly. It will be tastefully low key, as will be defined by the Local Municipality and will not unrightfully interfere with other existing advertising rights.	✓		✓		ARCHITECT, CONTRACTOR	Continuous	

Possible Impact	Mitigation measures	Applicable phases				Responsible Person	Frequency	Compliant
		DS	CO	OP	DE			
14.20 Penalties								
a) Payment of penalties	To prevent the contravention of the requirements of EMPr spot fines or penalties may be implemented in consultation with the CM.	✓	✓	✓		CONTRACT MANAGER, CONTRACTOR, ECO	Continuous	

APPENDIX A

UNDERTAKING BY DEVELOPER TO IMPLEMENT THE EMPr

Undertaking by the Developer

I,, acting on behalf of (the Developer), hereby indicate that I have read through the Environmental Management Programme and understand the measures required to be implemented in terms of the EMPr. I hereby undertake to implement these measures and carry out my duties as specified herein.

Signed at

on(date)

.....
Contractor's Environmental Representative Signature

Witness.....

Witness.....

APPENDIX B

UNDERTAKING BY THE CONTRACTOR

I,, acting on behalf of (the Contractor), hereby indicate that I have read through the Environmental Management Programme and understand the measures required to be implemented in terms of the EMPr. I hereby undertake to implement these measures and carry out my duties as specified herein.

Signed at

on(date)

.....
Contractor's Environmental Representative Signature

Witness.....

Witness.....

APPENDIX C

UNDERTAKING BY THE ENVIRONMENTAL CONTROL OFFICER

I,, the Environmental Control Officer appointed by, hereby indicate that I have read through the Environmental Management Programme, and understand the measures required to be implemented in terms of the EMPr and hereby undertake to fulfil my duties as specified herein.

Signed at

on(date)

.....
Environmental Control Officer Signature

Witness.....

Witness.....

APPENDIX D

ABBREVIATIONS AND DEFINITIONS

ARCH	Architect
CE	Consulting Engineer
CO	Construction
DE	Demolition
DS	Design
DWS	The Department of Water and Sanitation – both national office and their various regional offices, which are divided across the country on the basis of water catchment areas.
ECA	Environment Conservation Act (Act 73 of 1989)
ECO	Environmental Control Officer
EIA	An Environmental Impact Assessment as contemplated in Sections 21, 22 and 26 of the Environment Conservation Act
EMI	Environmental Monitoring Inspector – from Provincial Government (E.g. GDARD)
EMPr	Environmental Management Programme
FAUNA	All living biological creatures, usually capable of motion, including insects and predominantly of protein-based consistency.
FENCE	A physical barrier in the form of posts and barbed wire or any other concrete construction, ("palisade"- type fencing included), constructed with the purpose of keeping humans and animals within or out of defined boundaries.
FLOOD LINE	The line or mark to which a flood could rise, every 50 (1:50 year flood line), or 100 (1:100 year flood line) years
FLORA	All living plants, grasses, shrubs, trees, etc., usually incapable of easy natural motion and capable of photosynthesis.
FLORA	All living plants, grasses, shrubs, trees, etc., usually incapable of easy natural motion and capable of photosynthesis.
IEM	Integrated Environmental Management
MPRDA	The Mineral and Petroleum Resources Development (Act 28 of 2002)
NEMA	National Environmental Management Act (Act 107 of 1998)
NHRA	National Heritage Resources Act (Act 25 of 1999)
NWA	National Water Act (Act 36 of 1998)
OP	Operational
PENALTY	A fine against the contractor by the PM as per request from the ECO. This could also be used for the benefit of the labourers (such as a camp braai).
RA	Resident Architect
ROD	Record of Decision (approval or dismissal of project) as issued by GDACE
SABS	South African Bureau of Standards
SAHRA	South African Heritage Resource Agency
SAMOAC	South African Manual for Outdoor Advertising Control
SPOTFINE	A fine against a labourer by the PM as per request from the ECO. This fine should be used for the labourers' benefit.
SWALE	A depression between slopes that provides for drainage
TLB	Tractor, Load & Backhoe
TOPSOIL	The layer of soil covering the earth which-

- (a) provides a suitable environment for the germination of seed;
- (b) allows the penetration of water;
- (c) is a source of micro-organisms, plant nutrients and in some cases seed; and
- (d) is not of a depth of more than 0,5 metres or such depth as the Minister may prescribe for a specific prospecting or exploration area or mining area.

VEGETATION

Any and all forms of plants, see also Fauna

WETLAND

A wetland is defined as land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which under normal circumstances supports or would support vegetation typically adapted to life in saturated soil (Water Act 36 of 1998).

APPENDIX E

EMPR CHECKLIST

14.1	Planning	Score
a	The Developer must appoint an independent ECO who must monitor the contractor's compliance to the EMPr	
b	This EMPr must be made binding to the Contractor, as well as sub-contractors and should be included in the tender documentation for the construction contract	
c	The Contractor and Owner must take corrective action as per described procedure.	
d	Storm water must be implemented as per the approved Storm water Management Plan.	
e	The service systems are to be designed according to the minimum requirements of, and submitted to the Local authority for approval.	
f	Founding conditions for individual structures must be confirmed by a qualified geologist.	
g	Structures should meet the National Building Regulations.	
h	The natural features of the site should be managed in a holistic manner	
i	The Developer must determine which security system should be utilised for the site.	

14.2.1	Soil Compaction	Score
a	Designated routes shall be determined for the construction vehicles and designated areas for storage of equipment.	
b	All areas that are compacted by machinery shall be ripped prior to them being rehabilitated with topsoil and grass seed.	
c	Clearly mark the site access point and routes on site to be used by construction vehicles and pedestrians.	
d	Fence off areas which are off limits to vehicles	
e	Mark out the areas to be excavate	

14.2.2	Soil Erosion	Score
a	All surface run-offs shall be managed in such a way so as to ensure erosion of soil does not occur	
b	Straw bales or sandbags must be used as a mitigation measure against erosion where needed.	
c	No vehicles what so ever are allowed to move across any	

	sensitive areas (e.g. drainage line)	
d	Erosion caused by construction methods or unusually heavy rainstorms must be prevented and managed	
e	Straw bales should be placed and adequately secured on all downhill locations where erosion may occur to prevent washouts and to retain siltation and topsoil from the site	
f	Where it is necessary to clear large areas, the clearing activities must be followed by the planting of grass or covering of the surface prior to clearing the area	
g	Where it is necessary to clear slopes, the clearing activities must be followed by the planting of grass or covering of the surface prior to clearing the area	
h	The area being cleared of vegetation for the construction activities must be limited to a minimum	

14.2.3	Topsoil	Score
a	The top layer of all areas to be excavated for the purposes of construction shall be stripped and stockpiled in areas where this material will not be damaged, removed or compacted	
b	Stockpiling be done/ equipment be stored in already disturbed/exposed areas.	
c	Only areas directly affected by construction may be grubbed and stripped of topsoil	
d	When the stripping of topsoil takes place, the grass component shall be included in the stripped topsoil	
e	During the laying of pipes or infrastructure, topsoil shall be kept aside to cover the disturbed areas immediately after such activities are completed	
f	Stockpiling will only be done in designated places where it will not interfere with the natural drainage paths of the environment	
g	No stockpiling shall be allowed below the 1:100 year flood line / within the transitional zones	
h	Cover stockpiles and surround downhill sides with a sediment fence to stop materials washing away	
i	Care must be taken to prevent the runoff of silt from open soil and stockpiles into the sensitive areas	
j	Remove vegetation only in areas designated during the planning stage	
k	Stockpiles must meet the requirements of the OSHA	
l	No vehicles are allowed to traverse the stockpiled topsoil areas	

14.3.1	Construction waste	Score
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a	Plan the site before starting	
b	Temporary waste storage points on site shall be determined	
c	Prepare and submit a Waste Management Plan to the ECO.	
d	Solid waste shall be disposed of in a manner approved by the Department of Water and Sanitation (DWS)	
e	Keep records of waste reuse, recycling and disposal for future reference. Provide information to ECO	
f	Avoid the cleaning of the site camp or paved surfaces with soap	
g	On completion of works, the contractor shall clear away and remove from the site all construction paint, surplus material, foundations, plumbing and other fixtures of every kind	

14.3.2	Household waste	Score
a	Temporary waste storage points on the site should be determined	
b	No waste materials shall at any stage be disposed of in public areas or adjacent properties, or where the wind direction will carry bad odours across the properties of adjacent tenants or landowners	
c	Several waste bins must be provided and clearly marked or colour coded according to industry standards to allow for recycling of waste	
d	Waste bins with lids shall be provided on site at convenient locations	
e	The waste bins shall be cleared by approved waste contractor	

14.3.3	Chemical waste	Score
a	Design the site in such a manner that chemical wastes are not located in close proximity to any fire	
b	Cover any wastes that are likely to wash away or contaminate storm water.	
c	All hazardous waste shall be placed in specifically designed containers and properly sealed	
d	All containers shall be collected on a weekly basis by certified chemical removal companies	
e	All chemical waste shall be disposed of at a certified waste disposal site	

14.4.1	Fuel storage	Score
a	Fuel storage shall be within the construction camp, and within a bunded area with at least 110% of the volume of the amount of	

	fuel stored	
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14.4.2	Fueling	Score
a	According to approved legislation in a designated area	
b	Drip trays (min 10cm deep) are to be placed under all vehicles overnight	
c	In the event of spills from vehicles, the area should be cleaned immediately using a bioremediation product	
d	Applicable provincial and local government departments, local municipalities and adjacent landowners must be notified within 24 hours of a potentially hazardous spillage or leak	

14.4.3	Maintenance	Score
a	The maintenance yard and secured storage area will be established	
b	The maintenance of vehicles and equipment will take place only in the maintenance yard	
c	Equipment used in the development process must be adequately maintained	
d	Machinery or equipment used on the site must not constitute a pollution hazard	
e	Buildings, yards, paving areas, gardens, outside fencing or walls, etc. must be maintained in good standing at all times	

14.5.1	Dust control	Score
a	The liberation of dust into the surrounding environment shall be effectively controlled by watering.	
b	The speed of haul trucks and other vehicles must be strictly controlled.	

14.5.2	Fire	Score
a	A designated area shall be assigned for fire making	

14.5.3	Machinery	Score
a	Machinery or equipment used on the site must not constitute a pollution hazard in respect of air pollution via excessive exhaust fumes	
b	All vehicles transporting material to and from a site that can be blown off must be covered with a tarpaulin	

14.6.1	Working hours	Score
a	Hours stipulated by local Municipal bylaw	

b	As per HOA guidelines	
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14.6.2	Staying on site	Score
a	Where people stay on site, their actions and activities must be managed to avoid nuisance to adjacent occupants	

14.6.3	Noise on site	Score
a	Site workers must comply with the Provincial noise requirements	

14.7.1	Safety	Score
a	The site and crew are to be managed in strict accordance with the Occupational Health and Safety Act (85 of 1993) and the National Building Regulations	
b	No new informal settlement will be allowed on the premises or in the adjacent roads leading to the construction site	
c	It is the responsibility of the contractor to manage any informal traders on site	
d	All dangerous areas and deep excavations should be barrier taped	
e	The Contractor should ensure that the handling of equipment and materials is supervised and adequately instructed	
f	Clear sign boards should be erected at the site entrance	
g	A fire extinguisher should be accessible and the personnel should receive training in the use of a fire extinguisher	
h	A list with all the relevant emergency telephone numbers shall be pasted up in the site office	
i	Vehicular movement beyond the property boundaries should be limited during peak hours	

14.7.2	Security	Score
a	Security officers will remain on site for the purpose of guarding the equipment	
b	Access control must be enforced	
c	Fencing is required to demarcate the boundaries of the construction site and work camp	
d	No casual access to the work camp and the construction site will be allowed	
e	All negative effects caused by the erection of any temporary fences must be rehabilitated after construction is completed	

14.8	Chemical Toilets	Score
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a	One portable chemical toilet for every 30 workers must be established on site	
b	Chemical toilets shall not be in close proximity to any natural drainage channels or wetlands	
d	No person is allowed to use any other area than chemical toilets	
e	Regular inspections of toilets must be shall be carried out	
f	Toilet paper shall be supplied to all toilets	
g	Toilets shall be cleaned by a certified company on a weekly basis	
h	Toilets must be secured to the ground	
i	Shower and changing facilities must be erected separate for each sex	
j	Sheltered eating areas must be provided.	

14.9	Blasting on Site	Score
a	In cases where blasting is required, an authorisation must be obtained from the local blasting officer at the Local Police station and the Dept of Minerals and Resources	
b	The ECO, Contractor and Safety Officer will earmark a suitable area on site for a temporary magazine for the duration of the construction	
c	Blasting shall be limited to specific, pre-agreed periods of the day	
d	The National Blasting procedures and regulations must be adhered to.	

14.10	Fauna	Score
b	No construction worker activity whatsoever will be allowed outside of the specific construction area	
c	Snaring and hunting of fauna by construction workers on or adjacent to the site are strictly prohibited	
d	Workers must be trained on how to deal with fauna species as intentional killing will not be tolerated	

14.11	Flora	Score
a	Before any vegetation is removed, a suitably qualified person all inspect the study area for any plant/ grass/ tree species that could be transplanted to other similar/ suitable areas	
b	Any medicinal/ protected/ Red Data flora shall only be removed by a suitably qualified specialist and relocated	
c	Strictly no unauthorised access, land clearing, construction	

	activities, vehicular traffic of any kind, pedestrian traffic or fires will be permitted external of specific construction areas or in sensitive vegetation areas	
d	No clearing of vegetation will be allowed within any wetland/ natural drainage areas other than as indicated by the ECO	
e	All invader or exotic plant species must be removed from the site and disposed of at a landfill site	
f	The use of indigenous vegetation should be optimised during the landscaping of the development	
g	Wood harvesting of any trees or shrubs inside the protected area or adjacent areas for firewood shall be prohibited and subject to a fine	
h	On site floral assets and tree clumps shall be identified and retained where possible	
i	No street trees planted by the Local Municipality may be removed without prior approval by the relevant department	
j	No indigenous trees or floral assets may be removed without permission from the specialist or in some cases a flora removal permit may be required	
k	No trees, hedges or other large vegetation types may be planted along or over service pipelines/ areas	

14.12	Storm water	Score
a	Cover any wastes that are likely to wash away	
b	Build a bund around waste storage area to stop overflow into storm water	
c	Natural storm water must flow freely, either as sheet flow or where necessary in open grass swales	
d	Natural storm water must not be piped other than in areas where it runs perpendicularly cross a roadway	
e	Drainage channels must be constructed along access roads every 50m to divert runoff during construction period	
f	Energy dissipaters must be installed at all potential large flow volume areas	
g	The engineer's service report will also specifically address storm water to the satisfaction of the Local Municipality	
h	Where feasible the use of vegetated swales should be used to accommodate surface runoff, in order to increase infiltration into the soil	
i	Where feasible the utilisation of retention ponds should be applied	
j	Where alkaline soils occur and the design of the development	

	permits, swales should be used to infiltrate surface runoff	
k	The cross-section of the swale should be parabolic or trapezoidal in shape with side slopes no steeper than 1:3, to maximise the wetted channel perimeter	
l	Maintenance of the swale should include periodic mowing of the grass	
m	The designs of the swales, sedimentation ponds and check dams must be done by a hydrological engineer	
o	Approval must be obtained from DWS for the abstraction of groundwater	

14.13	Traffic Impact	Score
a	All requirements from the provincial roads and traffic departments and the Local Municipality must be adhered to	
b	Deliveries by abnormal vehicles may only take place during weekdays and pre-warning of at least one day prior to delivery must be given to the facility manager	
c	The access of large trucks will be investigated by the PM to provide a suitable access route	
d	Construction vehicles and activities must aim to avoid peak hour traffic times	
e	Access roads and traffic planning will adhere to Provincial and the Local Municipality requirements	
f	Access and travelling on site must follow current and established tracks only	

14.14.1	Rivers / Streams	Score
a	No activities may be allowed below any 1:100 year flood line or clearly definable drainage area. However should some minor encroachments of the 1:100 year flood line occur a Section 21 (c) and (i) Water Use License Application will be required.	
b	During construction all identified natural drainage lines must be fenced off	
c	No dumping will be allowed within any drainage areas. No bins shall be located within 50m of these areas	
d	No chemical toilets shall be situated within 50m from the natural drainage areas	
e	Surface runoff must be directed away from the streams and must be filtered or put into a municipal system prior to being released into the stream	
f	No vehicles whatsoever are allowed to move across the flood line areas unless authorised by the DWS, which could cause	

	erosion scouring and compaction	
g	No topsoil stockpiling, or stockpiling of any other material, shall be allowed below the 1:100 year flood line	
h	Where natural drainage channels join up with man-made channels, siltation ponds/ stilling basins shall be implemented	
i	No activity is allowed that will impede the longitudinal connectivity of drainage areas	
j	No bathing will be allowed in any of the water bodies on or adjacent to the site.	
k	No washing of clothes will be allowed in any water bodies on or adjacent to the site	
l	No taking of water from water bodies for drinking or cooking purposes will be allowed, as potable water should be available on site	
m	No urinating will be allowed anywhere on site, as this will result in an immediate fine	
n	Considerable attention must be given to avoid any vegetation disturbance within any natural drainage habitat zone and rocky outcrops	

14.14.2	Rocky Outcrops – not present on this project	
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14.14.3	Heritage / Cultural / Archaeological Sites	Score
a	Should any Cultural / Archaeological artefacts be discovered during construction activities, construction shall immediately cease and the ECO must be contacted.	
b	Any archaeological sites present on site shall be fenced and at least 5 metres around it should be safeguarded from construction and development	
c	No buildings / structures older than 60 years shall be damaged / demolished, or archaeological artefacts removed, without written authorisation from SAHRA	
d	Any burial ground or grave found on site will be reported immediately to the Contractor, ECO and Contract Manager	
e	The ECO will be notified of any suspicious artefacts prior to it being moved or removed	

14.15	Disruption in services	Score
a	If any disruption in services to outside portions are foreseen the contractor must inform the adjacent land owners and the ECO at least 4 days prior to these activities	

14.15.2	Installation of services	Score
a	The service systems are to be designed according to the minimum requirements of the Local Authority for approval	
b	Excavate, close and rehabilitate trenches as soon as possible after site services pipes are installed. Avoid open trenches for any extended period of time	
c	All trenching and excavations must be properly backfilled and compacted as per sub clause 5.7.1 of SABS 1200 DB.	
d	Caution must be exercised to prevent that the water pressure from the surrounding soil is not greater than that within the pipe, as this may lead to damage.	
e	Existing storm water channels and services are not to be impacted upon in any way during the course of construction, except when part of the construction scope of works	

14.16	Contractor's Site Camp	Score
a	A work site will be established and maintained for storing construction equipment on a non-sensitive area to be agreed upon by the ECO and contractor	
b	The site camp shall be fenced and all materials shall be stored within this camp	
c	The site camp shall not be situated within a natural drainage line or within 50m from a wetland or stream	
d	The area where the camp was established must after the construction period be rehabilitated to guidelines in this document or as otherwise directed by the ECO	

14.17	Environmental Awareness Training	Score
a	An environmental awareness-training program must be organized as part of the EMPr	
b	The employees, construction workers and maintenance crews will receive instruction in the appropriate activities	

14.18	Rehabilitation & Landscaping	Score
a	The use of indigenous vegetation should be optimised during the landscaping of the development	
b	All compacted areas (including backfilled trenches) should be ripped prior to them being rehabilitated.	
c	Stored topsoil and reseeded must be used to rehabilitate all open soil areas following construction activities	
d	Rehabilitation/ landscaping is to be done immediately after the involved works are completed	

e	The Contractor is responsible for the actions and works of the sub-contractors and is required to complete the rehabilitation work if the sub-contractor fails to do so	
f	On completion of works, clear away and remove from the site all construction paint, surplus materials, foundations, plumbing and other fixtures, rubbish and temporary works of every kind	
g	Cement mixing shall be done only at specifically selected sites. After construction activities ended the cement shall be crushed and removed from the site	
h	The natural features of the site should be managed in a holistic manner	

14.19	Advertising	Score
a	A graphic design of the advertisement will be subject to the approval of the appropriate local authority.	
b	Must meet local municipal requirements	

14.20	Penalties	Score
a	To prevent the contravention of the requirements of EMPr spot fines or penalties may be implemented in consultation with the CM.	

Compliance summary	
Score:	Count:
4 (Compliant)	
3 (Early Warning)	
2 (First warning)	
1 (Second Warning)	
0 (Immediate noncompliant)	

	RESULTS SUMMARY	
1	14.1 Planning	
2	14.2.1 Soil Compaction	
3	14.2.2 Soil Erosion	
4	14.2.3 Topsoil	
5	14.3.1 Construction waste	
6	14.3.2 Household waste	
7	14.3.3 Chemical waste	
8	14.4.1 Fuel storage	
9	14.4.2 Fueling	
10	14.4.3 Maintenance	

11	14.5.1 Dust control	
12	14.5.2 Fire	
13	14.5.3 Machinery	
14	14.6.1 Working hours	
15	14.6.2 Staying on site	
16	14.6.3 Noise on site	
17	14.7.1 Safety	
18	14.7.2 Security	
19	14.8.1 Chemical Toilets	
20	14.9 Blasting on Site	
21	14.10 Fauna	
22	14.11 Flora	
23	14.12 Storm water	
24	14.13 Traffic Impact	
25	14.14.1 Rivers / Streams / Wetlands	
26	14.14.2 Rocky Outcrops	
27	14.14.3 Heritage / Cultural / Archaeological Sites	
28	14.15.1 Disruption in services	
29	14.15.2 Installation of services	
30	14.16 Contractor's Site Camp	
31	14.17 Environmental Awareness Training	
32	14.18 Rehabilitation & Landscaping	
33	14.19 Advertising	
34	14.20 Penalties	