



**PROPOSED DEVELOPMENT OF A SECURITY VILLAGE AND
ASSOCIATED INFRASTRUCTURE ON ERF 3952 & 3975,
HARTSWATER, NORTHERN CAPE PROVINCE**

Environmental Management Plan

July 2018

Prepared for:



Prepared by:

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Today's Impact | Tomorrow's Legacy

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LIST OF ACRONYMS AND ABBREVIATIONS

CER	-	Contractors Environmental Representatives
DEO	-	Designated Environmental Officer
DWS	-	Department of Water and Sanitation
ECO	-	Environmental Control Officer
EIA	-	Environmental Impact Assessment
EIR	-	Environmental Impact Report
EMP'r	-	Environmental Management Program Report
EPC	-	Engineering Procurement Contractor
GDARD	-	Gauteng Department of Agriculture and Rural Development
I&AP's	-	Interested and Affected Parties
IDP	-	Integrated Development Plan
NEMA	-	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NEMBA	-	National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)
NHRA	-	National Heritage Resources Act, 1999 (Act No. 25 of 1999)
NSBA	-	National Spatial Biodiversity Assessment
NERSA	-	National Energy Regulator of South Africa
NWA	-	National Water Act, 1998 (Act No. 36 of 1998)
PHRA	-	Provincial Heritage Resources Agency
PPP	-	Public Participation Process
SAHRA	-	South African Heritage Resources Agency
SDF	-	Spatial Development Framework

GLOSSARY OF TERMS

Alien species: A plant or animal species introduced from elsewhere: neither endemic nor indigenous.

Applicant: Any person who applies for an authorisation to undertake an activity or undertake an Environmental Process in terms of the Environmental Impact Assessment Regulations – National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) as contemplated in the scheduled activities listed in Government Notice (GN) No R. 327, 325 and 324.

Biodiversity: The variety of life in an area, including the number of different species, the genetic wealth within each species, and the natural areas where they are found.

Cumulative Impact: In relation to an activity, cumulative impact means the impact of an activity that in itself may not be significant, but may become significant when added to the existing and potential impacts eventuating from similar or diverse activities or undertakings in the area.

Ecology: The study of the interrelationships between organisms and their environments.

Environment: All physical, chemical and biological factors and conditions that influence an object.

Environmental Impact Assessment: In relation to an application, to which Scoping must be applied, means the process of collecting, organising, analysing, interpreting and communicating information that is relevant to the consideration of the application.

Environmental Impact Report: In-depth assessment of impacts associated with a proposed development. This forms the second phase of an Environmental Impact Assessment and follows on from the Scoping Report.

Environmental Management Programme: A legally binding working document, which stipulates environmental and socio-economic mitigation measures that must be implemented by several responsible parties throughout the duration of the proposed project.

Heritage resources: This means any place or object of cultural significance. See also archaeological resources above

Precipitation: Any form of water, such as rain, snow, sleet, or hail that falls to the earth's surface.

Red Data species: All those species included in the categories of endangered, vulnerable or rare, as defined by the International Union for the Conservation of Nature and Natural Resources.

Riparian: The area of land adjacent to a stream or river that is influenced by stream induced or related processes.

Soil compaction: Soil becoming dense by blows, vehicle passage or other type of loading. Wet soils compact easier than moist or dry soils.

1 INTRODUCTION

This Environmental Management Programme (EMPr), amongst others, describes the mitigation measures and identifies the specific role players that will be responsible for implementation of the mitigation measures, in order to ensure that impacts on the environment are minimised during the construction, operational and decommissioning phases of the proposed development of a housing development of Erf 3952 & Erf 3975, Hartswater, Northern Cape Province.

This EMP'r must form part of the contractual agreement between the relevant Contractor(s) and the Developer/Applicant.

1.1 NEMA Regulation 19(4) Report Compliance

Regulation 19(4) of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) Environmental Impact Assessment (EIA) Regulations of 2017 provides the content requirements for Environmental Management Programmes. The table below lists the relevant requirements, indicates whether the relevant information is included in this report or not, and provides cross-references as to where the relevant information can be found in this report.

Table 1: Environmental Management Programme requirements in terms of Regulation 19(4) of the EIA Regulations of 2017.

Reg.	EMP'r Content	Included (Yes, No or N/A)	Report Section Reference
(a)	A draft environmental management programme must comply with section 24N of the Act and include - details of:		
	(i) the person who prepared the environmental management programme; and	Yes	Chapter 3
	(ii) the expertise of that person to prepare an environmental management programme;	Yes	Chapter 3
(b)	A detailed description of the aspects of the activity that are covered by the EMP'r as identified by the project description;	Yes	Chapter 4
(c)	A map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffers;	Yes	Chapter 2
(d)	A description of the impact management objectives, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including –	Yes	Chapter 9
	(i) planning and design;		
	(ii) pre-construction activities;		
	(iii) construction activities;		
	(iv) rehabilitation of the environment after construction and where applicable post closure; and,		
(v) where relevant, operation activities;			

Reg.	EMP'r Content	Included (Yes, No or N/A)	Report Section Reference
(e)	A description and identification of impact management outcomes required for the aspects contemplated in paragraph (d);	Yes	Chapters 7 & 9
(f)	A description of proposed impact management actions, identifying the manner in which the impact management objectives and outcomes contemplated in paragraphs (d) and (e) will be achieved, and must, where applicable, include actions to – (i) avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation; (ii) comply with any prescribed environmental management standards or practices; (iii) comply with any applicable provisions of the Act regarding closure, where applicable; and, (iv) comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable;	Yes	Chapter 9
(g)	The method of monitoring the implementation of the impact management actions contemplated in paragraph (f);	YES	Chapter 9
(h)	The frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f);	YES	Chapter 7
(i)	An indication of the persons who will be responsible for the implementation of the impact management actions;	YES	Chapter 9
(j)	The time periods within which the impact management actions contemplated in paragraph (f) must be implemented;	-	-
(k)	The mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);	YES	Chapter 9
(l)	A program for reporting on compliance, taking into account the requirements as prescribed by Regulations;	YES	Chapter 7
(m)	An environmental awareness plan describing the manner in which – (i) the applicant intends to inform his or her employees of any environmental risk which may result from their work; and, (ii) risk must be dealt with in order to avoid pollution or the degradation of the environment; and,	YES	Chapter 8
(n)	Any specific information that may be required by the Competent Authority.	-	-

1.2 Report Layout

The table below summarises the content layout of this report.

Table 2: Summary of Report content layout.

Chapter	Chapter Heading	Content Summary
1	Introduction	Provides a brief background to the proposed project, and explains the compliance of this report with regards to Regulation 33 of the NEMA.
2	Environmental Assessment Practitioner	Provides details of the EAP who prepared this EMP'r, and provides information on the expertise of the EAP.
3	Project Description and Listed Activities Covered by this EMP'r	Provides a brief project description, and describes the relevant project phases and the NEMA Listed Activities triggered.
4	Existing Environmental and Impact Assessment Summary	Summarises the biophysical, social, economic and cultural aspects of the existing environment, and provides a summary of the impact assessment outcome.

Chapter	Chapter Heading	Content Summary
5	Persons Responsible for Implementing this EMP'r	Provides information on the persons who will be responsible for implementing this EMP'r, and explains requirements with regards to on-site communication, site instruction entries, method statements, and record keeping.
6	Monitoring, Performance Assessment and Reporting on EMP'r Compliance	Provides information on monitoring, performance assessment and reporting on EMP'r Compliance, ECO site inspection reports, and photographs.
7	Environmental Awareness Plan	Provides information on environmental awareness and risk training, and basic rules of conduct. Also provides an environmental risk plan.
8	Impacts and Mitigation Measures	Provides EMP'rs for the relevant project phases.
9	Emergency Response Plan	Provides information on the emergency response plan.
10	Incident Register	Stipulates the content requirements for incident registers.
11	Rehabilitation Measures and Closure Plan	Provides rehabilitation measures and closure plan objectives.
12	Prevent Triggering of Further Listed Activities	Warns the proponent not to contravene the NEMA by engaging in unauthorised NEMA Listed Activities.
13	References	Lists all references referred to in this EMP'r.

2 MAP OF THE PROPOSED ACTIVITY

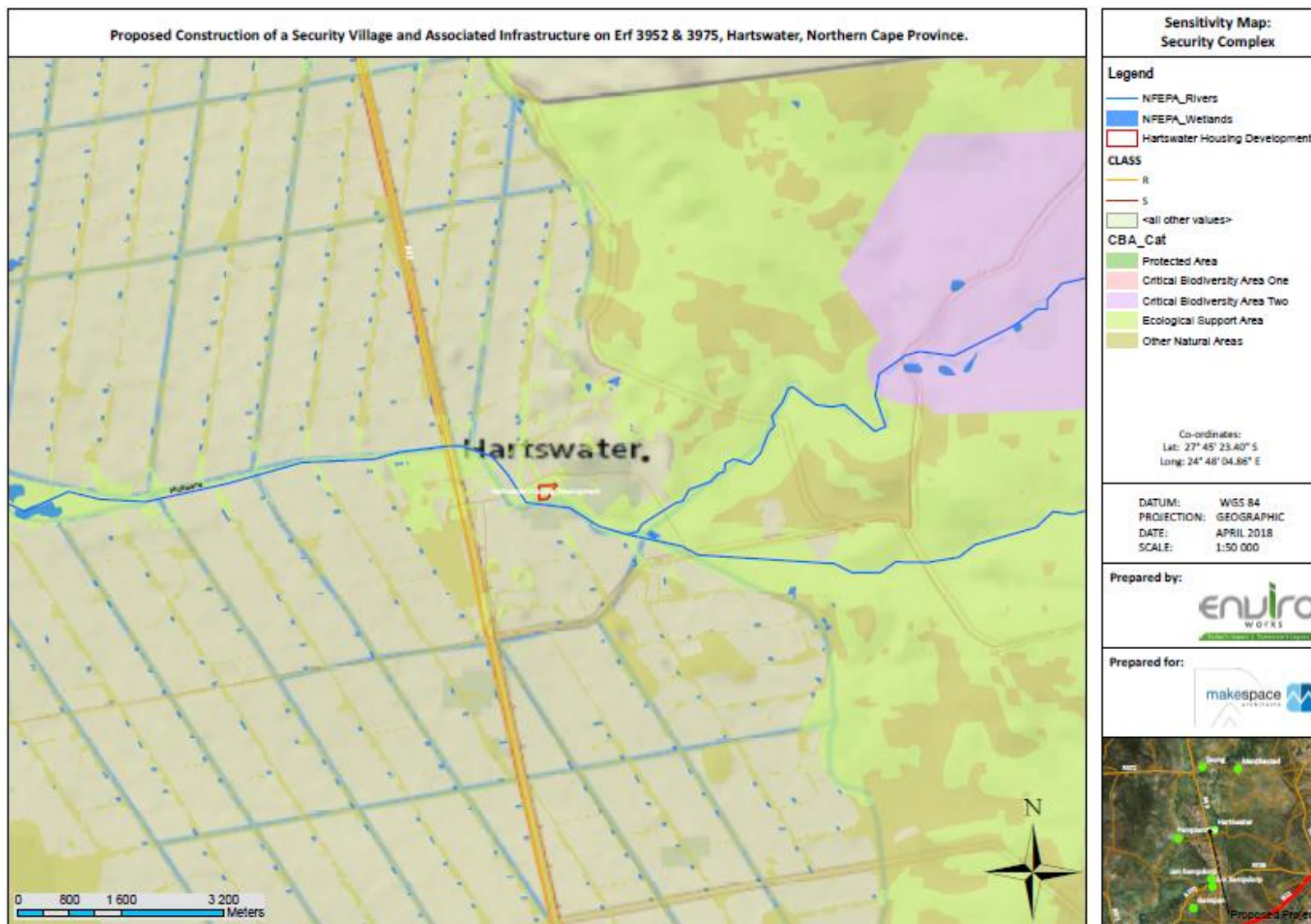


Figure 1: Sensitivity Map of the Proposed Area

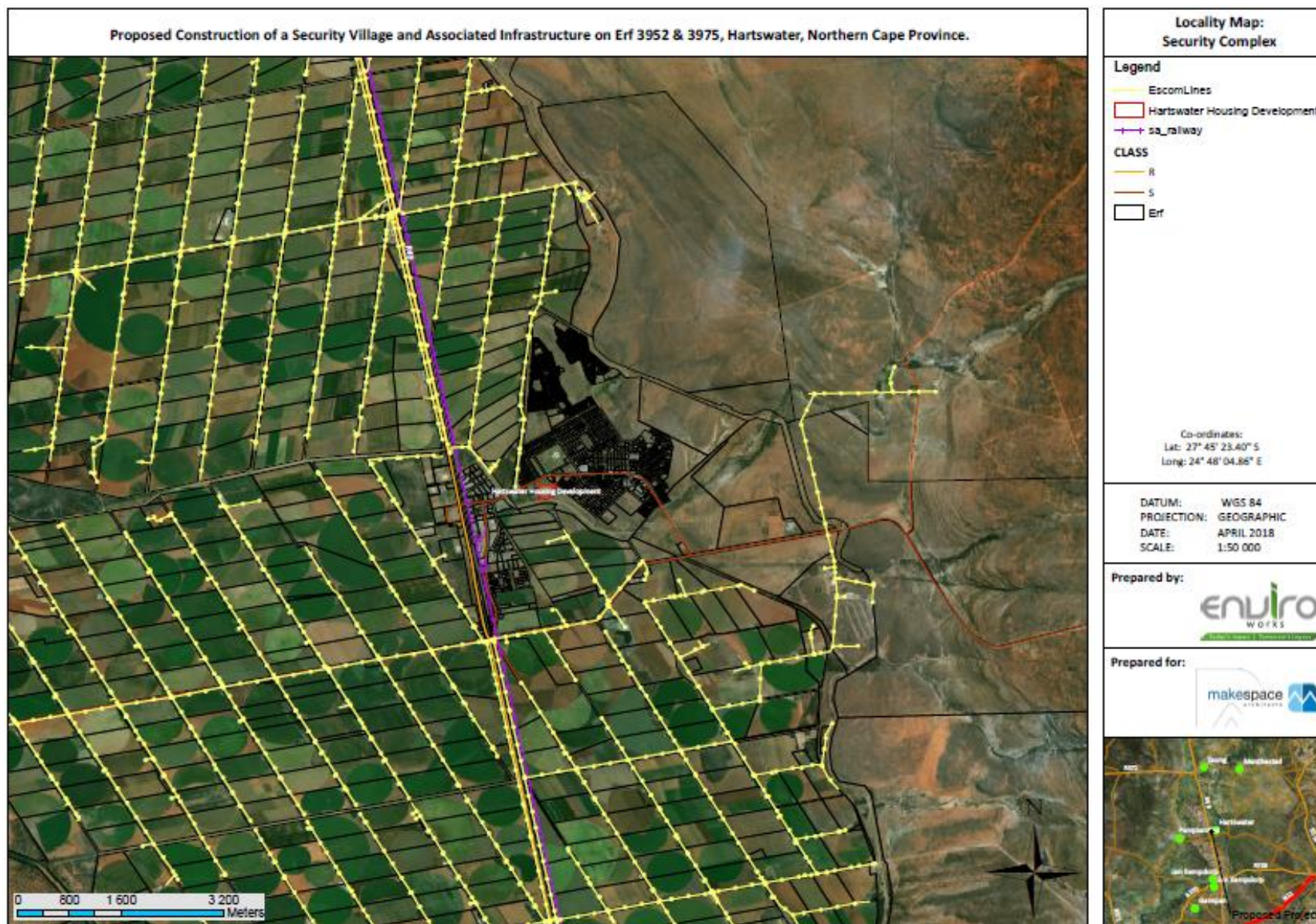


Figure 2: Layout Map of the Proposed Area

3 ENVIRONMENTAL ASSESSMENT PRACTITIONER

This Environmental Management Programme Report was prepared by Christoff du Plessis from Enviroworks, the Environmental Assessment Practitioner (EAP) who is undertaking this EIA process. The sections below provide the details of the EAP, and explain the EAP's expertise to prepare this EMP'r.

3.1 Details of the EAP

Business name of EAP:	Enviroworks
Physical address:	Block B2, Edison Square, C/o Edison way & Century Avenue, Century City, 7441
Postal address:	Suite 1064, Private Bag X2, Century City
Postal code:	7441
Telephone:	021 527 7084
E-mail:	christoff@enviroworks.co.za
Fax:	086 601 7507

3.2 Expertise of the EAP

Name of EAP	Education qualifications	Professional affiliations	Experience at environmental assessments (yrs)
Christoff du Plessis	B.Sc Environmental Geography	IAIA; SAGIC	3 years

3.3 Curriculum Vitae of the EAP



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Christoff du Plessis

RELEVANT QUALIFICATIONS

Baccalaureus Scientiae (B.Sc.) in Environmental Geography: University of the Free State (2014)

Baccalaureus Scientiae (B.SC) Honours in Environmental Management: University of South Africa (2018)

WORK EXPERIENCE

January 2015 – Present: Environmental Specialist at Enviroworks

KEY PROJECT EXPERIENCE

Environmental Impact Assessment Experience

- Environmental Impact Assessment for the proposed 171ha expansion of Nalisview Cemetery in Bloemfontein on behalf of Mr. Jannie Nel

BASIC ASSESSMENT EXPERIENCE

- Construction of 30 Broiler Houses and an Abattoir, Leipoldtville, Western Cape Province (Mocke Poultry).
- Dewetsdorp Reservoir System Augmentation, Dewetsdorp, Free State Province (Bloemwater).
- Construction of the Palmiet Truck Stop, Vrede, Free State Province (DeStudio Town Planning).
- Section 24G for the unlawful operation of a Recycling Centre, Swellendam, Western Cape Province (Agri-World Recyclers).
- Construction of a 3.2 kilometre pipeline and associated infrastructure, Olifantshoek, Northern Cape Province (Ghamagara Local Municipality).
- Construction of 4 telecommunication masts, Cape Town, Western Cape Province (Highwave Consultants).
- Installation of a 90 000l LPG Cylinder, Bloemfontein, Free State Province (EASIGAS).
- Installation of a 45 000l LPG Cylinder, East London, Eastern Cape Province (EASIGAS).
- Upgrade of Day-visitor facilities at Kraalbaai, West Coast National Park, Western Cape Province (SANParks).
- Development of the Phalaborwa Wildlife Activity Hub, Kruger National Park, Limpopo Province (SANParks).

- Periodic maintenance of National Route 2 Section 4 between Riviersonderend (Km 0.0) and Swellendam (Km 56.9), Western Cape Province (SANRAL).
- Proposed development of the Klein Mooimaak Rest Camp Facility, West Coast National Park (SANParks).
- Proposed development of the 35m Buffeljagsrivier Monopole Mast, Western Cape Province (Coast to Coast Towers).
- Compilation of a River Maintenance Management Plan for Bath River, Caledon, Western Cape Province (Theewaterskloof Local Municipality).
- Proposed development of a 12.5 ha cemetery, Grabouw, Western Cape Province (Theewaterskloof Local Municipality).
- Proposed development of Hostels and Orientation Centres, Mapungubwe National Park, Limpopo Province (SANParks).
- Proposed upgrade of the R27 Gate & Geelbek Restaurant, West Coast National Park, Western Cape Province (SANParks).
- Proposed development of the 25m Joostenbergvlakte Monopole Mast, Western Cape Province (Coast to Coast Towers).
- Proposed development of 30 Chicken Houses and an Abattoir, Odendaalsrus, Free State Province (Chridel Consulting).
- Design, Rehabilitation / Improvement, Routine Maintenance works of N220: Chissano to Chibuto and N/C Crz. N220 to N1, Mozambique (World Bank).
- Proposed development of a Curro Castle on Portion 54 of the Farm Blue Hills No. 397, Midrand, Gauteng Province (Curro Holdings).
- Proposed development of a 25m Monopole Mast on Portion 25 of the Farm Klein Bottelary No. 17, Brackenfell, Western Cape Province (Coast to Coast Towers).

EXPERIENCE IN PERMITS AND LICENCING

- Water Use License (General Authorisation) for the expansion of a cemetery by more than 2500 m² (Jannie Nel).
- Water Use License for 30 Broiler Houses and Abattoir, Leipoldville, Western Cape Province (Mocke Poultry).
- Waste Management License and Section 24 G report for Agri World Recycling, Swellendam, Western Cape Province (Agri-World Recycling).
- Water Use License (General Authorisation) for the construction of a 3.2km pipeline, Olifantshoek, Northern Cape Province (Ghamagara Local Municipality).

ENVIRONMENTAL CONTROL OFFICER (ECO)

- The construction of the Cecilia Park powerline and sub-station, Bloemfontein, Free State Province (Centlec).
- The construction of a dual carriageway and bridge from Mthatha up to and including the Ngqeleni interchange of Provinsial Road 61 Section 8, Eastern Cape Province.

- The construction of a road from Moretele to Khaukhwe, North West Province (Department Public Works).
- The construction of a 14km water pipeline, Botshabelo, Free State Province (Bloemwater).
- The construction of a sub-station, Bloemfontein, Free State Province (Centlec).
- The rehabilitation of bridges on National Route 14: Upington to Kuruman, Northern Cape Province (SANRAL).
- The rehabilitation of the Theekloof Pass, Fraserburg, Northern Cape.
- Annual Audit on the Waste Management License for Elgin Fruit Juice, Grabouw, Western Cape (Elgin Fruit Juice).
- Reseal of Diversional Road 1468, 1470, 1473 and Minor Road 5873 on behalf of Actophambili, Witzenberg, Western Cape Province.
- Reseal of Section MR 201 and MR 305 on behalf of Actophambili, Wolsely, Western Cape Province.
- Reseal of the National Route 1, on behalf of Actophambili, Leeu Ghamka, Western Cape Province (SANRAL).
- The widening of Pella Road on behalf of the City of Cape Town, Atlantis, Western Cape Province (City of Cape Town).
- The widening of structures over the Orange River on National Route 12 Section 9 near Hopetown, Northern Cape Province (SANRAL).
- The construction of a bulk water supply reservoir, Olifantshoek, Northern Cape Province (Ghamagara Local Municipality).
- Rehabilitation of the Donkergat Road within the West Coast National Park on behalf of BVI Procurement Management Engineers, Western Cape Province (Department of Defence & Department of Public Works).
- Periodic Maintenance of National Route 2 Section 4 between Swellendam and Riviersonderend, Western Cape Province (SANRAL).

VISUAL IMPACT ASSESSMENT (VIA):

- Phalaborwa Wildlife Activity Hub, Kruger National Park, Limpopo Province (SANParks).
- 4.9ha Sand Mine on Portion 5 of the Farm Doornekraal No. 830, Western Cape Province (Greenmined).
- Proposed development of the Harvard Powerline, Bloemfontein, Free State Province (Centlec).
- Proposed development of the 35m Buffeljagsrivier Monopole Mast, Buffeljagsrivier, Western Cape Province (Coast to Coast Towers).
- Proposed development of the 25m Robertson Monopole Mast, Robertson, Western Cape Province (Coast to Coast Towers).
- Proposed development of the Klein Mooimaak Rest Camp Facility, West Coast National Park (SANParks).
- Proposed development of a Sand Mine near Malmesbury, Western Cape Province (Greenmined).
- Proposed upgrade of the R27 Gate and Geelbek Restaurant, West Coast National Park, Western Cape Province (SANParks).
- Proposed development of the 25m Roodekrans Monopole Mast, Krugersdorp, Gauteng Province (Coast to Coast Towers).

- Proposed development of a 25m Monopole Mast on Portion 25 of the Farm Klein Bottelary No. 17, Brackenfell, Western Cape Province (Coast to Coast Towers).

WETLAND DELINEATION STUDIES:

- Development of 13 borrow pits along National Road 8, Ladybrand, Free State Province (SANRAL).
- Development of a 12.5ha cemetery on Erf 4233, Western Cape Province (Theewaterskloof Local Municipality).
- Proposed development for the proposed Alfred Nzo Agri-Hub, Cederville, Eastern Cape Province (Department Public Works).

STORMWATER MANAGEMENT PLANS:

- Stormwater Management Plan for a Recycling Plant on Erf 5273, Swellendam, Western Cape Province (Agri-World Recycling).
- Stormwater Management Plan for the proposed Granite Mine on the Remaining Extent of the Farm Biesjesfontein No. 218, Springbok, Northern Cape Province (Greenmined Environmental).
- Stormwater Management Plan for the proposed Six Layer Hen Houses on the Remaining Extent of the Farm Helena 1492, Bloemfontein, Free State Province (Katawa Trading).

OTHER EXPERIENCE

- Conducting the Public Participation Process on the Draft Management Plan for the Goukamma Nature Reserve Complex, Western Cape Province (Cape Nature).
- Compilation of an Environmental Management Plan and a Risk Assessment for the pressure testing of a 1 000 000 litre LPG Cylinder within the Port Elizabeth Harbour, Eastern Cape Province (EASIGAS).
- Compilation of an Environmental Management Plan for the development of two billboards, Bloemfontein, Free State Province (Outdoor Network).
- Decommissioning Audit for the closure of a warehouse, Cape Town, Western Cape Province (Wheatherford).
- GIS mapping and technical for various projects, including the drawing of locality, sensitivity, and alien and invasive management maps.
- Public Participation Processes and assistance to several projects.

4 PROJECT DESCRIPTION AND LISTED ACTIVITIES COVERED BY THIS EMP-R

4.1 Brief Project Description

Make Space Architects (PTY) Ltd appointed Enviroworks, an independent Environmental Consultant on behalf of Mr Julius Mongwaketse for the proposed residential development on Erf 3976, Hartswater, Northern Cape Province.

The proposed development will consist of the following:

- Forty two (42) residential erven varying between three hundred and seventy squares meters (378 m²) and eight hundred and twenty eight square meters (828 m²);
- A business centre with a development footprint of eight hundred and fifty square meters (850 m²) inclusive of:
 - Office spaces on the ground floor; and,
 - Thirty (30) apartment dwellings distributed over three (3) floors.
- Two Parking Areas:
 - Parking Area 1 is situated at the Business Centre and will provide 65 parking areas with a total development footprint of two thousand two hundred and sixty two square meters (2 262 m²); and,
 - Twenty visitor (20) parking's situated adjacent to the access road.
- Service Delivery Infrastructure:
 - Water and Sewage pipes;
 - Power supply cables (to be supplied by the Local Municipality); and,
 - Internal paved roads (please refer to Appendix C: Facility Illustrations).

The proposed development will have a total development footprint of three and a half hectares (3.6 ha). A re-zoning application will be submitted for the sub-division of Remainder of Erf 259 and subsequent consolidated with Erf 3952 to form Erf 3976.

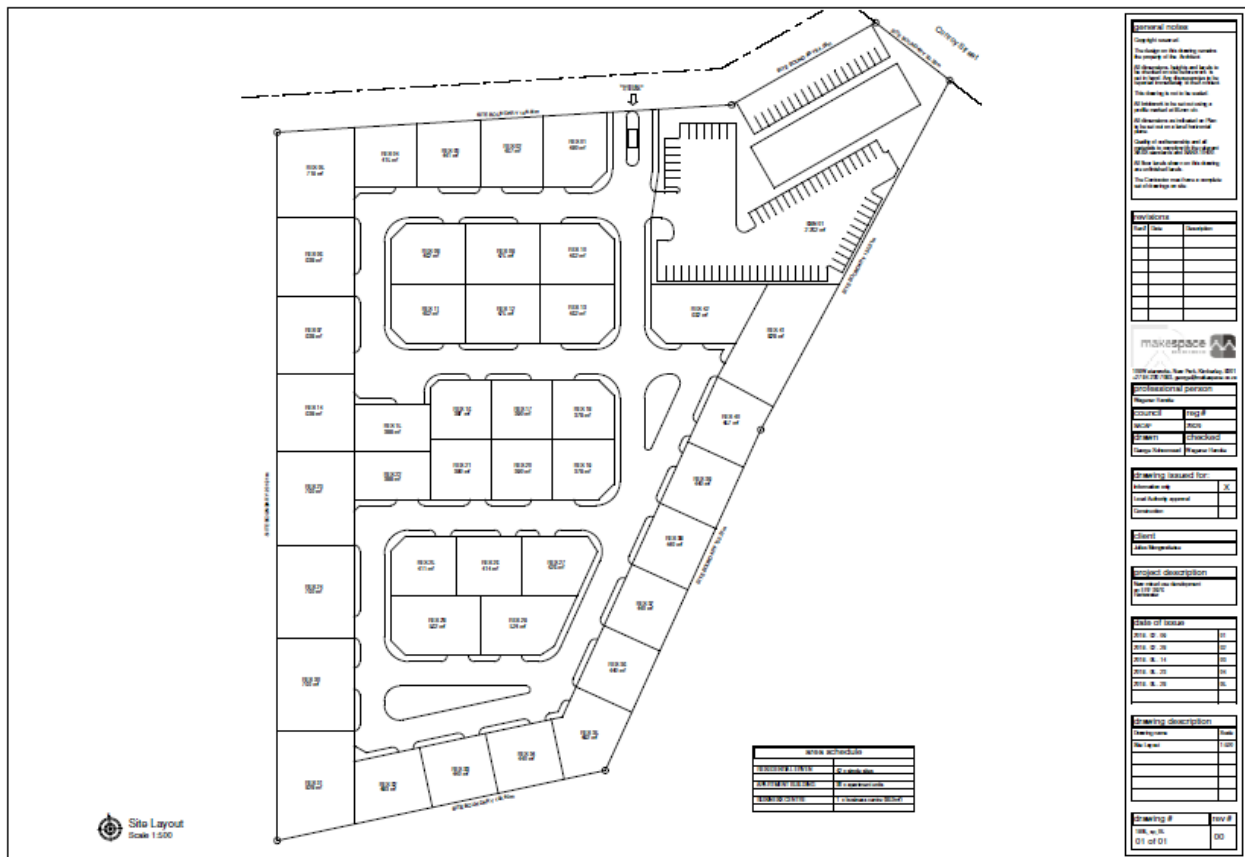


Figure 3: Proposed Layout of the Development.

4.2 Project Phases

Two phases:

- Construction Phase (includes planning, design, pre-construction and construction activities); and,
- Operational Phase.

4.3 NEMA Listed Activities Triggered

The NEMA EIA Listed Activities (as per the NEMA EIA Regulations Listing Notices 1, 2 and 3 of 2017) that will be triggered by the proposed project are listed in the table below.

Table 3: Listed Activities applicable to this application.

Listed Activity	Project Activity / Component
Government Notice Regulation No. 327 of 2017 (Listing Notice 1)	
Activity 27	The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation. Triggered reason: The proposed development will have a development footprint of three and a half hectares (3.6 ha) on an area with indigenous vegetation.
Government Notice Regulation No. 324 of 2017 (Listing Notice 3)	

Activity 12	<p>The clearance of an area of 300 square meters or more of indigenous vegetation.</p> <p>g. Northern Cape</p> <ul style="list-style-type: none"> ii. Within critical biodiversity areas identified in bioregional plans. iv. On land, where at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning. <p>Triggered reason: The proposed development will have a development footprint of three and a half hectares (3.6 ha) and is situated within an area classified as an Ecological Support Area (ESA).</p>
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5 EXISTING ENVIRONMENTAL AND IMPACT ASSESSMENT SUMMARY

The sections below summarise the existing environment, and the outcome of the impact assessment that was undertaken for the proposed project.

5.1 The Receiving Environment

The proposed project is situated within the urban edge of the town of Hartswater. The topography is flat with no “koppies” within the environment. The site is primarily surrounded by low density residential dwellings, local businesses and farming activities. Hartswater is renowned for its irrigation scheme and peacanut industry. As the proposed development is situated within the urban edge no biodiversity sensitive areas exist near the site; however, to the south of the development is a drainage canal which may not be polluted under any circumstances.

5.2 Public Participation

To support public interest and inform the EIA process, a Public Participation Process proceeded throughout the lifetime of the assessment. A diverse mix of Authorities, Stakeholders and Interested and Affected Parties were consulted during this time, representing the environment, social, economic and political realms of local and regional and national bodies.

Comments were responded to during various stages of the Public Participation Process in the Basic Assessment Report and were addressed in project reports as relevant. It is considered that through public participation conducted by the EAP, parties have had adequate opportunity to partake in this process and all concerns were addressed to ensure that all parties are in agreement with the proposed development.

5.3 Specialist Investigations

On assessment of the proposed location for alternatives, the specialist determined the following:

Ecological Impact Assessment (Enviroworks – Ms Elana Mostert)

The vegetation on site is largely degraded. The property has been subjected to vegetation destruction and alien invasive species establishment. There are several pioneer, weedy and alien invasive species found in the footprint area. The species will spread and re-emerge continually if not controlled and removed in a proper manner.

The relatively flat topography has facilitated water accumulating during wet periods, as evident from species present that prefer such a habitat. Stormwater management and draining should be implemented to properly drain run-off water.

No sensitive species or species of conservation concern were observed during the site visit. It is also unlikely that any species of conservation concern will occur on site. It is suggested that a botanical walkthrough be conducted before construction commences, to detect any flowering species that were missed before, that are of conservation concern.

It is important to prevent any sediment, pollution or litter from the site to enter the irrigation canal.

Conclusion:

If mitigation measures are implemented, the likelihood of significant ecological impacts occurring on ecosystem will be reduced to low levels. The overall footprint of the proposed facility is not likely to generate a significant impact on broad scale ecological processes or landscape connectivity, on condition that all mitigation measures are followed. Any risk of pollution due to inappropriate disposal of waste and litter can be mitigated to an acceptable level through the appropriate waste management and ensuring that no runoff or contaminated effluent from the construction site or development enters the environment.

Overall, the likely impacts associated with the development are likely to be low and there are no anticipated impacts of high significance. Consequently, it is suggested that the proposed project to continue only if all recommended mitigation measures as per this ecological report and Risk Matrix are adequately implemented and managed during the construction phase, operational – and decommissioning phase of the proposed project. All necessary authorizations and permits must also be obtained prior to any commencement (Mostert, 2018).

Geo-Technical Investigation (GCS – Mr Warren Kretzinger)

General

The most important consideration in relation to the proposed development is the ubiquitous presence of thick potentially collapsible silty clayey or clayey silty Aeolian soils to on average 1.65 m depth.

Geology & Ground Conditions

The site is underlain by a thin fill horizon, further underlain by Aeolian deposits to around 1.65 m depth, further underlain by calcretized Aeolian soils to around 2.5 m depth, but many in fact extended deeper than this.

Excavations

Soft excavation in terms of SABS 1200 D may be anticipated to around 2.5 m in depth on site.

Foundations

Three provincial foundation options have been provided.

Further Investigation

Finally, the ground conditions described in the report refer specifically to those encountered at the test positions advanced on site. It is therefore possible that conditions at variance with those discussed above may be encountered elsewhere on the site. In this regard it is critical that material management be maintained continuously on site and that GCS Geotechnical carry out periodic inspections of the site during construction to ensure that any variation in the anticipated ground condition can be assessed and revised recommendations subsequently provided in order to avoid unnecessary delays and expense. Furthermore, it is important that the construction phase of the project be treated as an augmentation of the geo-technical investigation.

Heritage Impact Assessment (Palaeo- Field Services – Dr Lloyd Russouw)

The affected area is underlain by intrusive volcanic rocks that are considered to be of no paleontological significance. It is highly unlikely that fossil remains will be encountered during excavation activities within the study area. There is little chance of finding fossil material within the superficial overburden due to a lack of suitable Quaternary-aged alluvial deposits at the site.

There are no major palaeontological grounds to suspend excavation activities within the proposed development footprint. Impact on potential *in situ* archaeological remains, engravings localities or historically significant structures within the study area is considered unlikely. There are no major archaeological grounds to suspend excavation activities within the proposed development footprint. The proposed development footprint is assigned a site rating of Generally Protected C (GP C).

5.4 Environmental Impact Ratings

Planning, design and construction phase	Layout Alternative 1		Layout Alternative 2	
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation
POTENTIAL IMPACTS ON GEOGRAPHICAL AND PHYSICAL ASPECTS				
Nature of impact: Negative impact of	Activity: The establishment of a main site office and storage site during the construction period will ensure			

Planning, design and construction phase	Layout Alternative 1		Layout Alternative 2	
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation
POTENTIAL IMPACTS ON GEOGRAPHICAL AND PHYSICAL ASPECTS				
haphazard placement of infrastructure on the environment.	that the poor placement of materials and infrastructure will be avoided. This could also result in the damage or pollution to surrounding areas caused by construction activities.			
Significance rating:	M	L	M	L
Cumulative impact:	-	-	-	-
Nature of impact: Topsoil Removal and Soil Erosion	Activity: The clearing of topsoil and excavation for the establishment of building foundations may result in the destruction of fertile topsoil.			
Significance rating:	L	L	L	L
Cumulative impact:	-	-	-	-
Nature of impact: Surface and groundwater contamination due to construction activities such as the use of hazardous materials on site e.g. fuel and oil.	Activity: Spills could possibly occur on site and lead to the contamination of soil and groundwater.			
Significance rating:	M	L	M	L
Cumulative impact:	L	-	L	-
Nature of impact: Handling of general waste materials on the development site.	Activity: The presence of personnel and construction operations on site will increase the likelihood of littering and the dumping of solid waste.			
Significance rating:	M	L	M	L
Cumulative impact:	L	-	L	-
Nature of impact: Increased risk of veld fires.	Activity: Due to the presence of construction personnel in natural areas, fires can occur if not managed to the correct standard.			
Significance rating:	M	L	M	L
Cumulative impact:	-	-	-	-
Nature of impact: Traffic impacts associated with the movement of construction vehicles on site.	Activity: The movement of vehicles on site may result in the destruction of biodiversity, compaction of valuable topsoil and mortalities of fauna on site.			
Significance rating:	L	L	L	L
Cumulative impact:	-	-	-	-
Nature of impact: Traffic impacts associated with the movement of construction vehicle.	Activity: The movement of vehicles in the vicinity of the construction site may cause damage to road surfaces as well as increase in the traffic volume of Hartswater.			
Significance rating:	M	L	M	L

Planning, design and construction phase	Layout Alternative 1		Layout Alternative 2	
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation
POTENTIAL IMPACTS ON GEOGRAPHICAL AND PHYSICAL ASPECTS				
Cumulative impact:	M	L	M	L

Planning, design and construction phase	Layout Alternative 1		Layout Alternative 2	
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation
POTENTIAL IMPACTS ON BIOLOGICAL				

Nature of impact: Direct impact on vegetation during construction and loss of species.	Activity: The construction of several permanent structures on site will result in the loss of vegetation due to foundation excavation.			
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Significance rating:	M	L	M	L
Cumulative impact:	-	-	-	-

Nature of impact: Dust nuisance generated by the operation of machinery and vehicles.	Activity: The construction activities of the proposed project could potentially result in fugitive dust emissions due to vegetation removal. Dust could spread into the surrounding areas. The significance of this potential impact will likely; however, be only temporary.			
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Significance rating:	L	L	L	L
Cumulative impact:	M	L	M	L

Nature of impact: Fauna will be directly impacted as a result of construction activities and human presence at the site.	Activity: The construction of facilities will result in some habitat loss for resident fauna, as some species will occur within the affected areas. In addition, increased levels of noise, pollution, disturbance and human presence during construction will be detrimental to resident fauna. Sensitive and shy fauna may move away from the area during the construction phase as a result of the noise and human activities present, while some slow-moving species (such as mole rats or blind snakes) would not be able to avoid the construction activities and might be killed.			
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Significance rating:	L	L	L	L
Cumulative impact:	L	-	L	-

Nature of impact: Spread and establishment of Alien and Invasive Species	Activity: Soil disturbances from construction will enhance the encroachment of Alien and Invasive vegetation that will out compete indigenous counterpart species for resources, displace and reduce faunal and flora biodiversity. Clearing current Invasive Alien species will increase the risk of spreading species if not properly removed and safety transported.			
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Significance rating:	M	L	M	L
Cumulative impact:	L	-	L	-

Nature of impact: Water quality of the nearby canal	Activity: The irrigation canal can potentially be at risk to increased surface runoff due to change in surface texture and effluent from the housing development.			
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Significance rating:	M	L	M	L
Cumulative impact:	L	-	L	-

Planning, design and construction phase	Layout Alternative 1		Layout Alternative 2	
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation
POTENTIAL IMPACTS ON SOCIO-ECONOMIC ASPECTS				

Planning, design and construction phase	Layout Alternative 1		Layout Alternative 2	
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation
POTENTIAL IMPACTS ON SOCIO-ECONOMIC ASPECTS				
Nature of impact: Occupational Health and Safety.	Activity: During the construction phase, accidents, occupational diseases, ill health and damage to property can occur if pre-cautionary measures are not taken. Increased movement of vehicles may lead to increased accidents among local communities, construction workers and vehicle operators.			
Significance rating:	M	L	M	L
Cumulative impact:	-	-	-	-
Nature of impact: Construction activities may have a positive impact on the local and regional socio economic conditions.	Activity: During the construction phase of the project the construction process may have a positive impact on the local and regional socio-economic conditions by means of job creation.			
Significance rating:	L (+)	M (+)	L (+)	M (+)
Cumulative impact:	-	-	-	-

Planning, design and construction phase	Layout Alternative 1		Layout Alternative 2	
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation
POTENTIAL IMPACTS ON CULTURAL-HISTORICAL ASPECTS				
Nature of impact: Damage and destruction of vertebrate fossils during excavation activities.	Activity: Excavation activities can result in the discovery of cultural and historical artefacts beneath the earth surface. Damage or loss can occur if the correct procedures are not followed.			
Significance rating:	L	L	L	L
Cumulative impact:	-	-	-	-

Planning, design and construction phase	Layout Alternative 1		Layout Alternative 2	
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation
POTENTIAL VISUAL IMPACTS				
Nature of impact: Impact on the sense of place for surrounding users.	Activity: The movement of construction vehicles, machinery and personnel on site shall result in a visual impact on surrounding users. Furthermore to this, the storage of materials and excavation shall result in disturbance and an unsightly character.			
Significance rating:	M	L	M	L
Cumulative impact:	L	-	L	-

Planning, design and construction phase	Layout Alternative 1		Layout Alternative 2	
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation
POTENTIAL NOISE IMPACTS				
Nature of impact: Noise nuisance generated by construction works, vehicles and personnel.	Activity: The operating of vehicles and machinery on site results in the generation of noise disturbing users of the surrounding area.			
Significance rating:	M	L	M	L
Cumulative impact:	M	L	M	L

OPERATIONAL PHASE IMPACTS

Operational Phase	Layout Alternative 1		Layout Alternative 2	
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation
POTENTIAL IMPACTS ON GEOGRAPHICAL AND PHYSICAL ASPECTS				
Nature of impact: Handling of general waste materials on the development site.	Activity: Due to the increase in homeowners within the area, waste will be generated.			
Significance rating:	M	L	M	L
Cumulative impact:	L	L	L	L
Nature of impact: Traffic impacts associated with the movement of vehicles within the area.	Activity: The regular movement of residents and business clients within the area would increase traffic flow and impede vehicle movement.			
Significance rating:	M	L	M	L
Cumulative impact:	L	L	L	L
Nature of impact: Surface and groundwater contamination from the Complex Facility.	Activity: Surface and groundwater can become contaminated due to operation of the complex facility.			
Significance rating:	M	L	M	L
Cumulative impact:	-	-	-	-

Operational Phase	Layout Alternative 1		Layout Alternative 2	
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation
POTENTIAL IMPACTS ON SOCIO-ECONOMIC ASPECTS				
Nature of impact: The development may lead to higher criminal activities in the area.	Activity: Due to the high concentration of residents and business properties on Erf 3952 & 3975 criminals may be drawn to the area.			
Significance rating:	L	L	L	L
Cumulative impact:	-	-	-	-
Nature of impact: Operation Activities may have a positive impact on the local and regional socio economic conditions.	Activity: During the operational phase of the proposed development housing and business opportunities will be created for the Local Community of Hartswater.			
Significance rating:	M (+)	N/A	M (+)	N/A
Cumulative impact:	-	N/A	-	N/A

Operational Phase	Layout Alternative 1		Layout Alternative 2	
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation
POTENTIAL IMPACTS ON NOISE				
Nature of impact: Noise nuisance	Activity: Noise nuisance that may be created by residents, businesses and maintenance work due to			

Operational Phase	Layout Alternative 1		Layout Alternative 2	
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation
POTENTIAL IMPACTS ON NOISE				
generated by residents and businesses.	operational/living activities.			
Significance rating:	MH	L	MH	L
Cumulative impact:	L	-	L	-

6 RECOMMENDATIONS OF THE EAP

The following recommendations have been made by the Environmental Assessment Practitioner:

1. All Specialist recommendations must be strictly adhered to;
2. It must be ensured that no effluent water enters the drainage channel situated to the south of the proposed development;
3. Where applicable members from the local community must be employed during the construction phase as well as the operational phase;
4. The site must be landscaped once construction has ended to ensure that the aesthetics of the environment is not negatively affected;
5. The Environmental Management Plan Report should form part of the conditions of approval of this Application;
6. An Environmental Control Officer must be appointed to monitor environmental compliance at least twice a month;

The Environmental Impact Assessment process has assessed impact associated with the proposed development and determined, based on the outcomes of a multitude of contributing information that the proposed development would not result in any unacceptable impact or fatal flaws and as such may be authorized.

7 PERSONS RESPONSIBLE FOR IMPLEMENTING THIS EMPR

The “Responsibility” columns in the impact and mitigation tables provided below indicate which team member(s) are responsible for implementation of the identified mitigation measures; these team members include the following:

- Construction contractor(s);
- Construction manager;
- Applicant / Developer; and the
- Designated Environmental Officer

The sections below list further supplementary measures, which must also be implemented by the relevant team members.

During the **Construction Phase**, the **construction Contractor** will:

- Be responsible to have the EMP'r available on site at all times;
- Provide the applicant with a "Method Statement" which will indicate the procedures that will be applied in order to meet the requirements of any aspect of the EMP'r; and
- Ensure that all problems identified during environmental inspections, are addressed and rectified as soon as reasonably possible.

During the **Construction Phase**, the **Contract Project Managers** will:

- Have the authority to stop work and issue fines;
- Receive reports from the ECO and report to the Client;
- Enforce contractor obligations to the EMP-r; and,
- Support the ECO in his/her roles and responsibilities.

During the **Construction Phase**, the **Environmental Control Officer** will:

- Meet with the Contractor and Project Manager to hand over the site and go through the content of the EMP-r, including the "do's and don'ts" of the project, in order to ensure that the parties understand their responsibilities to the EMP-r;
- Be accountable for monitoring and auditing activities to ensure compliance with the EMP-r and the Environmental Authorisation;
- Work correctively with other role-players, but not be influenced in opinion and must report to the Applicant only;
- May, in the event of there being a serious threat to or impact on the environment, correspond with the contract project manager to stop work;
- Complete an ECO checklist after each site inspection and distribute this to the project team within 5 days; and,
- Conduct a Final Environmental Audit of the project on completion of construction and rehabilitation, for submission to the DENC to review.

During the **Operational Phase** the **Applicant/Developer**, will be responsible to prevent negative environmental impacts, and as such will be responsible to:

- Set aside a budget for maintenance;

- Maintain all facilities and infrastructure in good working order to effectively fulfil its intended purpose and to prevent negative environmental impacts;
- Not construct any additional buildings, infrastructure, etc. contrary to the Environmental Authorisation, without performing an environmental impact assessment where listed activities of the 2017 NEMA EIA Regulations are triggered; and,
- To immediately remedy any aspects that contribute to negative environmental impacts.

7.1 On-site Communication

The following sections describe the site communication measures that will need to be implemented.

7.1.1 Site Instruction Entries

The Site Instruction book must be used for the recording of general site instructions as they relate to the works on site. It must also be used for the issuing of **stop work orders** for the purposes of immediately halting any particular activities of the contractor in lieu of the environmental risk that they may pose.

7.1.2 Method Statements

Method statements from the Contractor will be required for specific sensitive actions on request by the Authorities or the ECO.

A method statement forms the baseline information on which work in sensitive environments takes place and is a “live document” allowing for modifications to be negotiated between the Contractor and ECO / Engineer, as circumstances unfolds.

A method statement describes the scope of the intended work, step-by-step, in order for the ECO and Engineer to understand the Contractor’s intentions. This will enable them to assist in devising any mitigation measures, which would minimise environmental impacts during these tasks. For each instance wherein it is requested that the Contractor submit a method statement to the satisfaction of the ECO, the format must 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 (if applicable); and
- **When** – the sequencing of actions with due commencement dates and completion date estimates.

All method statements will form part of the EMP'r documentation and are subject to all terms and conditions contained within the EMP'r main document.

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

7.1.3 Record Keeping

All records related to the implementation of this EMP'r (e.g. site instruction book, method statements) must be kept together in an office where it is safe and can be retrieved easily. These records must be kept for two years and must at any time be available for scrutiny by any relevant Authority.

7.2 Monitoring

Several monitoring actions are proposed which would be undertaken by various project role players. For detail on these actions, "Responsible Person/Party", and "Monitoring Frequency" associated with the identified mitigation measures, refers to the "Monitoring" column in the impact assessment below (Chapter 8).

7.3 Performance Assessment and Reporting on EMP'r Compliance

A suitably-qualified Environmental Control Officer (ECO) must be appointed by the Applicant / Developer to oversee the implementation of the construction phase mitigation measures described in this EMP'r, as well as the conditions of authorisation as described in the Environmental Authorisation.

The ECO may not be someone appointed by the Contractor, engineer or other party involved with this project, other than the Applicant / Developer.

The following applies, amongst others, to the ECO's role:

- The ECO must undertake **bi-monthly site visits** during the **Construction Phase**,
- The ECO must **report to** the Applicant / Developer only.
- The ECO must present an **environmental site induction / awareness training session** to all personnel before work on site commences, as are also described below; and
- After completion of the construction activities, an environmental audit must be undertaken by the ECO, before commencement of the Operational Phase, in order to determine compliance with the EMP'r and the Environmental Authorisation. The audit report must be submitted to the Competent Authority.

The ECO can recommend the stopping of works if in his/her opinion there is a serious threat to, or impact on the environment, caused directly from the construction operations. This authority is to be limited to emergency situations where consultation with the Engineer or Applicant is not immediately available. In all

such work stoppage situations the ECO is to inform the Engineer and Applicant of the reasons for the stoppage as soon as possible.

Upon failure by the Contractor or his employee(s) to show adequate consideration to the environmental aspects of this contract, the ECO may recommend to the Engineer to have the contractor's representative or any employee(s) removed from the site or work suspended until the matter is remedied. No extension of time will be considered in the case of such suspensions and all costs will be borne by the Contractor.

7.3.1 ECO Site Inspection Reports

The ECO site inspection reports (also called "ECO Checklists") will report on the compliance of the construction phase mitigation measures contained in the EMP'r, as well as the conditions of approval described in the Environmental Authorisation. The report must be submitted to the Applicant, within seven (7) days of the ECO site inspection, and must be made available to the construction Contractor. Copies of the inspection reports must be kept on site.

The contractor's meeting minutes must reflect environmental queries, agreed actions and dates of eventual compliance. These minutes form part of the official environmental record.

7.3.2 Photographs

It is recommended that photographs are taken of the site prior to, during and immediately after construction as a visual reference. These photographs must be stored with other records related to this EMP'r. If captured in digital format, hard copies, in colour, must be kept with all other records relevant to the implementation of this EMP'r.

8 ENVIRONMENTAL AWARENESS PLAN

8.1 Environmental Awareness and Risk Training

All contractor team members involved in work on site are to be briefed on their obligations towards environmental controls and methodologies in terms of this EMP'r, prior to work commencing. The briefing will usually take the form of an on-site talk and demonstration by the ECO. The education / awareness programme must be aimed at all levels of management within the contractor team. See "basic rules of conduct" below.

8.1.1 Basic Rules of Conduct

The following list represents the basic *Do's* and *Don'ts* towards environmental awareness, which all participants in this project must consider whilst carrying out their tasks. These are not exhaustive and serve as a quick reference aid.

NOTE: ALL new site personnel must attend an environmental awareness/induction presentation. Please inform your foreman or manager if you have not attended such a presentation or contact the ECO.

DO:

- Clear your work areas of litter and building rubble at the end of each day – use the waste bins provided and prevent litter from being blown away by wind.
- Report all fuel or oil spills immediately and stop the spill from continuing.
- Dispose of cigarettes and matches carefully, so to prevent veld fires (arson and littering is an offence).
- Confine work and storage of equipment to within the immediate work area.
- Use all safety equipment and comply with all safety procedures.
- Ensure a working fire extinguisher is immediately at hand if any “HOT WORK” is undertaken e.g. welding, grinding, gas cutting etc.
- Prevent excessive dust and noise.

DO NOT:

- Do not litter - report dirty or full facilities, i.e. full dustbins and dirty or blocked toilets.
- Do not make any fires.
- Do not enter any fenced off or demarcated areas.
- Do not allow waste, litter, oils or foreign materials into any storm water channels or drains or watercourses.
- Do not litter or leave food lying around.

9 IMPACTS AND MITIGATION MEASURES

A number of potential environmental impacts that may arise during the project have been identified. These are outlined in the following table below, and guidelines and mitigation measures are provided.

The Contractor must familiarise himself with the requirements of the EMP'r, keeping in mind that other site-specific requirements as outlined in the Environmental Authorisation must also be complied with.

9.1 Construction Phase Environmental Management Programme

CONSTRUCTION PHASE: PROPOSED DEVELOPMENT OF A HOUSING DEVELOPMENT ON ERF 3952 & 3975, HARTSWATER, NORTHERN CAPE PROVINCE		RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIAN T? (for use by ECO)
1. ACTIVITY: PERMITS AND AUTHORISATIONS				
1.1	<p>Aspects: Legislative compliance.</p> <p>Impact: Non-compliance with South African Environmental Legislation.</p> <p>Objective: Ensure compliance with all triggered Environmental Legislation.</p> <p>Target: Commence site establishment with all permission and approvals received and on hand.</p> <p>Mitigation/Management Measures:</p> <p>a. The Developer is to have the following permits on commencement:</p> <ul style="list-style-type: none"> • Environmental Authorisation; • Environmental Management Program; • General Water Use License; • Heritage Permit; and, • Building approval from the Municipality. 	Developer	<p>Monitoring Action:</p> <p>Obtain copies of all permits; Record Keeping</p> <p>Responsible Person/Party:</p> <p>Applicant</p> <p>Monitoring Frequency:</p> <p>Once off</p>	
2. ACTIVITY: SITE LAYOUT PLANNING				
2.1	<p>Aspects: Site Layout Plan.</p> <p>Impact: Negative impact on the environment of unmanaged and unplanned placement of Infrastructure.</p> <p>Objective: To ensure acceptable impact and management of environmental issues at the main site and storage site during construction by proper planning of layout of infrastructure placement.</p> <p>Target: All areas not demarcated for construction must remain vegetated and the impact must be minimised.</p>	Contractor	<p>Monitoring Action:</p> <p>Records of the Site Layout must be present on site.</p> <p>Responsible</p>	

<p align="center">CONSTRUCTION PHASE: PROPOSED DEVELOPMENT OF A HOUSING DEVELOPMENT ON ERF 3952 & 3975, HARTSWATER, NORTHERN CAPE PROVINCE</p>	<p align="center">RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)</p>	<p align="center"><u>MONITORING:</u> ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY</p>	<p align="center">COMPLIAN T? (for use by ECO)</p>
<p><u>Mitigation/Management Measures:</u></p> <ul style="list-style-type: none"> a. Draw up and submit for approval a Site Layout Master Plan. This plan must show the final positions and extent of all permanent and temporary site structures and infrastructure (inclusive of the distance from any sensitive environmental areas); b. The planning for layout must be done in consultation, on-site, with the Environmental Control Officer (ECO); c. The contractor may not deface, paint, damage or mark any natural features situated in or around the site for survey or other purposes; d. The contractor must ensure that all construction personnel, labourers and equipment remain within the demarcated construction sites at all times; e. No servicing of vehicles may be permitted on site, unless for emergency purposes; f. Stockpiles may not be situated in such a manner that they obstruct pathways; g. Location of storage area must take into account prevailing winds, distance to water bodies and general on-site topography; h. Place infrastructure as far as possible on sites that have already been transformed; i. Facilities may not be used as staff accommodation; j. The Contractors camp layout must take into account availability of access for deliveries and services and any future works; k. The Contractors camp must be of sufficient size to accommodate the needs of all sub-contractors that may work on the project; and, l. The Contractor must implement the following as required: 		<p><u>Person/Party:</u></p> <p>Contract Project Manager / Engineer</p> <p><u>Monitoring Frequency:</u></p> <p>Once off</p>	

CONSTRUCTION PHASE: PROPOSED DEVELOPMENT OF A HOUSING DEVELOPMENT ON ERF 3952 & 3975, HARTSWATER, NORTHERN CAPE PROVINCE		RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
	<p>m. Suitable sanitation facilities, adequate for the number of staff on site (1 for every 15 personnel and 1 for each gender); and,</p> <p>n. Facilities for solid waste collection.</p>			
3. ACTIVITY: CONSTRUCTION PROGRAMME / SCHEDULE				
3.1	<p>Aspects: Project Management.</p> <p>Impact: Order and timing of construction activities and associated impacts.</p> <p>Objective: To Provide a clear indication of the order by which key construction activities will transpire.</p> <p>Target: Anticipate timing of impacts to coordinate the availability of any Specialists and/or Authorities who may be required to conduct site inspections.</p> <p>Mitigation/Management Measures:</p> <p>a. Draw up and sign off a project schedule with all contributing parties and service providers to commit to a timeline during which time construction milestones will be completed;</p> <p>b. Communicate any deviation from this schedule to all parties, so as to provide parties with sufficient opportunity for alternative arrangements to be made;</p> <p>c. Establish a risk register to identify and monitor potential factors which may result in setbacks/ delays on tasks within the project schedule;</p> <p>d. Hold management meetings with representatives of the project manager, contractor, engineer and other contributing parties to monitor and anticipate changes; and,</p> <p>e. Should circumstances/ incidents arise which may pose a risk to the project schedule, the construction contractor, and engineer and ECO are to keep records of this and the latter communicate this in the ECO Bi-Monthly Audit Checklist.</p>	All Construction Parties	<p>Monitoring Action:</p> <p>Meetings; Risk Register; ECO Audit Checklist; Photographs</p> <p>Responsible Person/Party: Contract Project Manager / Contractor / ECO</p> <p>Monitoring Frequency:</p> <p>Once off</p>	

CONSTRUCTION PHASE: PROPOSED DEVELOPMENT OF A HOUSING DEVELOPMENT ON ERF 3952 & 3975, HARTSWATER, NORTHERN CAPE PROVINCE		RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
4. ACTIVITY: COMMUNICATION WITH LAND-OWNERS				
4.1	<p>Aspects: Landowner Consent.</p> <p>Impact: Disturbance of existing land use.</p> <p>Objective: Maintain a conflict-free relationship with landowners / users.</p> <p>Target: No complaints received from landowners / users of affected property.</p> <p>Mitigation/Management Measures:</p> <ol style="list-style-type: none"> Landowners are to be aware and in agreement of site access arrangements; Landowner has to provide consent to the site supervisor of the construction contractor prior to entering the construction footprint area for safety purposes; All property gates are to be kept closed when not in use (or kept in the open/closed state in which it was found); and, Any complaint or liaison with regard to environmental aspects, compensation or disorder to economic activities, must not be addressed by the Contractor. A public complaint register must be kept on site and the contract project manager must inform the Developer and/or ECO to take further action. 	Contract Project Manager / Contractor & Applicant	<p>Monitoring Action:</p> <p>Meetings; Risk Register.</p> <p>Responsible Person/Party:</p> <p>Contract Project Manager / Contractor / ECO</p> <p>Monitoring Frequency:</p> <p>Monthly</p>	
5. ACTIVITY: SITE ESTABLISHMENT				
5.1	<p>Aspects: Demarcation of the site and vegetation removal.</p> <p>Impact: Direct impact on vegetation during construction and loss of species.</p> <p>Objective: Prevent unnecessary habitat destruction.</p> <p>Target: All areas not demarcated for construction must remain vegetated.</p>	Construction Contractor	<p>Monitoring Action:</p> <p>ECO to take photographs of site before clearance; ECO</p>	

<p align="center">CONSTRUCTION PHASE: PROPOSED DEVELOPMENT OF A HOUSING DEVELOPMENT ON ERF 3952 & 3975, HARTSWATER, NORTHERN CAPE PROVINCE</p>	<p align="center">RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)</p>	<p align="center"><u>MONITORING:</u> ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY</p>	<p align="center">COMPLIAN T? (for use by ECO)</p>
<p><u>Mitigation/Management Measures:</u></p> <ul style="list-style-type: none"> a. No natural surfaces are to be marked other than using droppers, beacons or other artificial object; b. Ensure the upkeep of demarcation boundaries throughout the period of construction until rehabilitation has been completed; c. Construction areas must be fenced; d. Keep areas affected to a minimum, strictly prohibit any disturbance outside the demarcated foundation footprint area; e. Clear as little indigenous vegetation as possible, aim to maintain vegetation where it will not interfere with the construction or operation of the development, rehabilitate an acceptable vegetation layer according to rehabilitation recommendations of the relevant EMP'r, if possible; f. There must be a pre-construction environmental induction for all construction staff on site to ensure that basic environmental biodiversity principles are adhered to; g. Where the ECO deems it necessary (e.g. sensitive, natural areas) the ecologist appointed to do the vegetation study will be utilized; h. Restoration measures will be required to reinstate functionality in the disturbed soil and vegetation; i. Impacts to sensitive sites (drainage lines) must be avoided; j. An additional ecological walkthrough be conducted prior to commencement of the project during the flowering period to ensure that no provincially- or nationally protected or significant species have been omitted; k. Posters of species of conservation concern should be kept on site where they will be visible to construction personnel; l. No vegetation may be gathered for the purpose of creating fire; and, m. Areas to be cleared should be agreed and demarcated before the start of the clearing operations. 		<p>Audit Checklist.</p> <p><u>Responsible Person/Party:</u> ECO</p> <p><u>Monitoring Frequency:</u> Bi-Monthly</p>	

CONSTRUCTION PHASE: PROPOSED DEVELOPMENT OF A HOUSING DEVELOPMENT ON ERF 3952 & 3975, HARTSWATER, NORTHERN CAPE PROVINCE		RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIAN T? (for use by ECO)
<p>5.2</p>	<p>Aspects: Topsoil stripping and conservation. Impact: Destruction of topsoil. Objective: Conserve and protect topsoil from erosion and destruction. Target: Topsoil condition maintained.</p>	<p>Construction Contractor</p>	<p>Monitoring Action: ECO Audit Checklist; Photographs;</p> <p>Responsible Person/Party: ECO & DEO</p> <p>Monitoring Frequency: Bi-Monthly</p>	
<p>Mitigation/Management Measures:</p> <ol style="list-style-type: none"> a. In the absence of a distinguishable topsoil layer, strip the uppermost 300 mm of soil; b. Stockpile topsoil separately from subsoil, in heaps no higher than 2m; c. Topsoil stockpiles are to be kept free of weeds; d. Limit unnecessarily prolonged exposure of stripped areas and stockpiles; e. Topsoil stockpiles to be placed on a levelled area and measures to be implemented to safeguard the piles from being washed away in the event of heavy rains/ storm water; f. Topsoil need to be stored in designated areas only. This need to be planned and indicated on the site-layout plan; g. Retain vegetation and soil in position for as long as possible, removing it immediately ahead of construction/ earthworks in that area; h. Strip and stockpile herbaceous vegetation, overlying grass and other fine organic matter along with the topsoil; i. Ensure that topsoil is not mixed with subsoil and/or any other excavated material; j. Temporarily stored topsoil must be re-applied within 6 months, topsoil stored for longer need to be managed according to a detailed topsoil management plan; k. Topsoil must be used in all rehabilitation activities, and may not be compacted to ensure that its plant support capacity remain of high quality; 				

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	<ul style="list-style-type: none"> l. Provide containment and settlement facilities for effluents from concrete mixing and washing facilities; m. Provide spill containment facilities for hazardous materials like fuel and oil; n. Do not strip topsoil when it is wet; and, o. Do not mix topsoil obtained from different sites, unless the ECO gives permission. 			
6. ACTIVITY: SITE INFRASTRUCTURE PLACEMENT AND OPERATION				
6.1	<p>Aspects: Structures and lay-down areas.</p> <p>Impact: Deterioration of site features and surrounding areas.</p> <p>Objective: Prevent the deterioration of site features like soil, rainwater runoff and erosion.</p> <p>Target: The preservation of site conditions evident on establishment of structures and lay-down areas.</p> <p>Mitigation/Management Measures:</p> <ul style="list-style-type: none"> a. Locate all structures and storage areas, including offices, workshops and stores in approved locations as per the Site Layout Plan; b. The camp with storage and laydown areas are to be kept secure and neat with access control measures adopted during construction; c. Clearly define which activities are to occur within which areas of the site by erecting signage; and, d. All hazardous substances, such as fuel, oil, diesel, paint, etc., must be stored in a secondary containment system (trays or bund) which is capable of storing at least 110% of the liquid capacity. If bund areas are used, it must be sealed to avoid seepages. 	Construction Contractor	<p>Monitoring Action:</p> <p>Photographs; ECO Audit Checklist</p> <p>Responsible Person/Party:</p> <p>ECO</p> <p>Monitoring Frequency:</p> <p>Bi-Monthly</p>	
7. ACTIVITY: CONSTRUCTION SITE OPERATIONS				
7.1	Aspects: Security and fencing.	Construction	Monitoring Action:	

CONSTRUCTION PHASE: PROPOSED DEVELOPMENT OF A HOUSING DEVELOPMENT ON ERF 3952 & 3975, HARTSWATER, NORTHERN CAPE PROVINCE		RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
	<p>Impact: Prevent danger to trespassing of persons.</p> <p>Objective: Keep the site secure from trespassing or theft and keep animals out.</p> <p>Target: Site remains secure during construction with no incidences of trespassing, theft and injury or death to animals.</p> <p>Mitigation/Management Measures:</p> <ol style="list-style-type: none"> Be responsive to open or closed status of gates; New or the upkeep of fences must be align to ensure safety of animals and maintain a reliable boundary area; Limit clearing of vegetation for fencing to the removal of trees and shrubs within 1 m of the fence line. All undergrowth must be maintained; Should construction activities require the removal of fences or gates to execute tasks, this must be replaced as soon as possible following completion; and, In all cases, the landowners on whose property any use of fences or gates, must be consulted, to ensure that parties are informed of construction activity, schedules and vehicle movement. 	Contractor	<p>Photographs; ECO</p> <p>Audit Checklist</p> <p>Responsible Person/Party: ECO & DEO</p> <p>Monitoring Frequency: Bi-Monthly</p>	
7.2	<p>Aspects: Existing Services and Infrastructure.</p> <p>Impact: Damage to existing services and infrastructure.</p> <p>Objective: No damages to existing services and infrastructure.</p> <p>Target: No damages to existing services and infrastructure.</p> <p>Mitigation/Management Measures:</p> <ol style="list-style-type: none"> Take cognisance of the position of existing services and infrastructure (e.g. roads, pipelines, power lines and telephone services) that may get damaged due to construction activities; Ensure that existing services are not damaged or disrupted unless required by the contract and with the permission of 	Construction contractor	<p>Monitoring Action:</p> <p>Photographs; ECO</p> <p>Audit Checklist</p> <p>Responsible Person/Party: Contractor & DEO</p> <p>Monitoring Frequency:</p>	

CONSTRUCTION PHASE: PROPOSED DEVELOPMENT OF A HOUSING DEVELOPMENT ON ERF 3952 & 3975, HARTSWATER, NORTHERN CAPE PROVINCE		RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIAN T? (for use by ECO)
	<p>the project manager; and</p> <p>c. In the event that infrastructure is damaged or services interrupted during construction, it will be done at the expense of the Contractor and shall receive top priority over all other activities.</p>		Bi-Weekly	
7.3	<p>Aspects: Traffic.</p> <p>Impact: Impact on traffic.</p> <p>Objective: Minimise the disruption of road users.</p> <p>Target: Minimal disruption of road users.</p>	Construction Contractor	<p>Monitoring Action:</p> <p>Incident Register; Photographs; ECO Audit Checklist</p> <p>Responsible Person/Party:</p> <p>DEO & ECO</p> <p>Monitoring Frequency:</p> <p>Bi-Monthly</p>	
	<p>Mitigation/Management Measures:</p> <p>a. All vehicles must be road-worthy and drivers must be qualified, made aware of the potential road safety issues, and need for strict speed limits;</p> <p>b. Vehicles used for transport of materials and sand must be fitted with tarpaulins to prevent the release of such material or items onto road surfaces;</p> <p>c. Construction vehicles may not leave the designated roads and tracks and turnaround points must be limited to specific sites;</p> <p>d. Abnormal loads must not be transported after dark;</p> <p>e. Abnormal loads must be timed to avoid times of year when traffic volumes are likely to be higher, as would be expected over national holidays, weekends and school holiday periods;</p> <p>f. Loads should be timed to avoid times of the day when traffic volumes are likely to be higher (06:00 – 09:00 and 16:00 – 18:00);</p> <p>g. Transport of materials must be limited to the least amount of trips possible; and</p>			

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	h. Traffic deviations around the construction area must be planned in conjunction with the Local Authority to ensure safe and free flow of traffic. Safety signs must be utilised.			
7.4	<p>Aspects: Traffic.</p> <p>Impact: Traffic impacts associated with the movement of construction vehicles on site.</p> <p>Objective: To minimise the destruction of biodiversity, compaction of valuable topsoil and mortalities of fauna on site.</p> <p>Target: Minimal destruction of biodiversity, compaction of valuable topsoil and mortalities of fauna on site.</p>		<p>Monitoring Action:</p> <p>Incident Register; Photographs; ECO Audit Checklist</p> <p>Responsible Person/Party:</p> <p>Contractor, DEO & ECO</p> <p>Monitoring Frequency:</p> <p>Bi-Monthly</p>	
	<p>Mitigation/Management Measures:</p> <p>a. During construction create designated turning areas and strictly prohibit any off-road driving or parking of vehicles and machinery outside designated areas;</p> <p>b. Monitor the establishment of (alien) invasive species and remove as soon as detected, before regenerative material can be formed;</p> <p>c. Abnormal loads and machinery must avoid movement over gravel roads during and immediately after rainfall events, so as to limit destruction of road surfaces and sedimentation of downhill rivers/streams;</p> <p>d. All vehicles must be road-worthy, be maintained to prevent fuel or oil leaks and drivers are to be licensed appropriately for the driving of their assigned vehicle. Drivers responsible for the transportation of personnel must be specifically licensed to do so;</p> <p>e. Construction vehicles may not leave the designated roads and tracks, whilst U-Turns are prohibited on all roads;</p> <p>f. Signage is to be placed on vehicles at all times;</p> <p>g. All construction vehicles must adhere to construction sites and avoid off road to minimise impact on vegetation and soil;</p>	Construction Contractor		

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	<p>h. After decommissioning, if access roads or portions thereof will not be of further use to the landowner, remove all foreign material and rip area to facilitate the establishment of vegetation, followed by a suitable revegetation program; and,</p> <p>i. Construction-related vehicles and machinery may not operate on site without reflective safety signage, car-top lights and reflective personnel gear.</p>			
7.5	<p>Aspects: Erosion Control.</p> <p>Impact: Loss of topsoil, formation of bare soil and deterioration of habitat quality.</p> <p>Objective: Prevent soil erosion.</p> <p>Target: No signs of soil erosion are evident on site.</p> <p>Mitigation/Management Measures:</p> <p>a. Disturb as little ground area as possible, stabilize that area as quickly as possible, control drainage through the area, and trap sediment on site;</p> <p>b. Conserve topsoil with its leaf litter and organic matter, and re-apply this material to local disturbed areas to promote the growth of local native vegetation;</p> <p>c. Apply erosion control measures before the rainy season begins and after each season of construction, preferably immediately following construction; and,</p> <p>d. Maintain and re-apply erosion control measures until vegetation is successfully established.</p>	Construction Contractor	<p>Monitoring Action:</p> <p>Incident Register; Photographs; ECO Audit Checklist</p> <p>Responsible Person/Party:</p> <p>Contractor</p> <p>Monitoring Frequency:</p> <p>Bi-Monthly</p>	
7.6	<p>Aspects: Handling of general – and hazardous waste materials on the construction site.</p> <p>Impact: The presence of personnel and construction operations will increase the likelihood of littering and dumping of solid waste.</p>	Construction Contractor	<p>Monitoring Action:</p> <p>ECO Audit Checklist; Safe Disposal</p>	

<p align="center">CONSTRUCTION PHASE: PROPOSED DEVELOPMENT OF A HOUSING DEVELOPMENT ON ERF 3952 & 3975, HARTSWATER, NORTHERN CAPE PROVINCE</p>	<p align="center">RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)</p>	<p align="center"><u>MONITORING:</u> ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY</p>	<p align="center">COMPLIAN T? (for use by ECO)</p>
<p>Objective: Management and disposal of general – and hazardous waste in an appropriate manner.</p> <p>Target: No record of pollution or site contamination by solid waste.</p> <p>Mitigation/Management Measures:</p> <ol style="list-style-type: none"> a. An adequate number of scavenger proof litter bins are to be placed throughout the site. Two waste bins at least must be present, one (1) for hazardous waste and one (1) for non-hazardous waste at each working site. Dumping of waste on site is prohibited; b. Waste sorting and separation must form part of the environmental induction and awareness programme, to encourage personnel to collect waste paper, glass and metal waste separately; c. Keep all work sites including storage areas, offices and workshops neat and tidy; d. Dedicate a demarcated and signposted storage area on site for the collection of construction waste; e. All domestic waste is to be removed from site and disposed of at a registered solid waste landfill site (Hartswater Landfill site) as mentioned in the Basic Assessment Report; f. Care must be taken to ensure that no waste fall off disposal vehicles on-route to the landfill. If needed, a tarpaulin can be utilised; g. The burning or burying of solid waste on site is prohibited. Do not burn PVC pipes or other plastic materials, as this is regarded as hazardous waste; h. Littering by construction workers shall not be permitted; i. General refuse/rubbish shall be removed from site on a weekly basis to an approved registered landfill site or as soon as the waste bins are reaching full capacity; j. Minimise waste by sorting wastes into recyclable and non-recyclable waste; 		<p>Documentation & Photographs</p> <p><u>Responsible Person/Party:</u> ECO & DEO</p> <p><u>Monitoring Frequency:</u> Bi-Monthly</p>	

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	<p>k. Ablution facilities must be serviced by a registered service provider, cleaned at least once a week, and safe disposal slips must be on file at the site office;</p> <p>l. A bi-weekly (twice a week) litter patrol of the entire site shall be conducted by the Designated Environmental Officer (DEO);</p> <p>m. Hazardous waste must be sorted from non-hazardous waste and disposed of at a hazardous treatment facility, records and proof of disposal must be kept; and,</p> <p>n. A register must be kept of the quantities of waste disposed and proof of disposal must be available at the site office.</p>			
7.7	<p><u>Aspects:</u> Sewage waste.</p> <p><u>Impact:</u> Pollution and site contamination due to sewage.</p> <p><u>Objective:</u> Provide facilities for appropriate collection and disposal of sewage.</p> <p><u>Target:</u> No record of pollution or site contamination by sewage.</p>	Construction Contractor	<p><u>Monitoring Action:</u> ECO Audit Checklist; Safe Disposal Slips & Photographic Evidence</p> <p><u>Responsible Person/Party:</u> ECO & DEO</p> <p><u>Monitoring Frequency:</u> Bi-Monthly</p>	
	<p><u>Mitigation/Management Measures:</u></p> <p>a. Provide portable chemical ablution facilities, situated at convenient locations in proximity to work areas. This must be in relation to the quantity of users on site, with 1 ablution facility per 15 users and for each gender;</p> <p>b. Locations for the placement of ablution facilities include the workshop and areas for resting and eating.</p> <p>c. Ablution facilities are to be maintained and cleaned regularly to ensure functionality and an adequate level of hygiene;</p> <p>d. Drinking water facilities, comprising of a water tank with a manual tap can be combined with hand washing facilities near site ablution; and,</p> <p>e. Only toilet paper is to be flushed down the chemical ablution facility. Personnel are to be informed on sanitary implementation as part of the environmental awareness.</p>			

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7.8	<p>Aspects: Dust Generation and visual Impact.</p> <p>Impact: Dust nuisance from site operations and visual impact of site operations on surrounding land owners.</p> <p>Objective: To avoid dust from excavated materials and construction activity and unnecessary visual impact caused by site operations.</p> <p>Target: Minimise the incidence of dust generation and visual impact.</p>	Construction Contractor	<p><u>Monitoring Action:</u> ECO to take photographs of the site; ECO Audit Checklist; Public Complaints Register</p> <p><u>Responsible Person/Party:</u> ECO & DEO</p> <p><u>Monitoring Frequency:</u> Bi-Monthly</p>	
<p><u>Mitigation/Management Measures:</u></p> <ul style="list-style-type: none"> a. Dust masks are to be supplied to workers; b. The transfer of soil or aggregate must be done over the shortest possible distance; c. A speed limit of 30 km/h must be applied on gravel roads; d. Any complaints received by the Contractor regarding dust will be recorded and communicated to the ECO; e. Ensure all vehicles remain on designated roads and avoid the opening of detour or by-pass tracks; f. Access roads are to be kept clean; g. Surface material that is scraped off during construction must be conserved and used for rehabilitation. Any spoil material must be disposed of in a manner that appears natural; h. Lay-down area(s) must be screened with shade cloth in an earth tone or other appropriate neutral colour; i. Site offices and structures must be limited to one location and carefully situated to reduce visual intrusion. Roofs must be grey and non-reflective; j. Lights within the construction camp must face directly downwards (angle of 90°); k. Avoid shiny materials in structures. Where possible shiny metal structures must be darkened or screened to prevent glare; 				

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	<p>l. Litter must be strictly controlled, as the spread thereof through wind could have a very negative visual impact; and,</p> <p>m. The minimum amount of topsoil and vegetation must be removed during construction, must be conserved and used for final rehabilitation.</p>			
7.9	<p>Aspects: Noise Generation.</p> <p>Impact: Noise nuisance from site operations.</p> <p>Objective: To avoid excessive noise generation from site operations.</p> <p>Target: Minimise the incidence of noise generation.</p> <p>Mitigation/Management Measures:</p> <p>a. Should multiple activities result in the excessive generation of noise, it must be strived to coordinate the incidence of these at the same time;</p> <p>b. Fit machinery with silencers;</p> <p>c. All stationary noisy equipment such as compressors and pumps must be contained behind acoustic covers, screens or sheds where possible;</p> <p>d. The regular inspection and maintenance of equipment must be undertaken to ensure that all components function optimally;</p> <p>e. Vehicles must avoid the use of their reverse gear as far as possible so as to avoid the sounding of sirens. This must not be considered for temporary access routes as disturbance of adjacent vegetation is to be avoided;</p> <p>f. Where recurrent use of machinery is frequent, machines must be shut down during intermediate periods;</p> <p>g. Unless otherwise specified by the DEO, normal working hours will apply (i.e. from 07H00–18H00, Mondays to Fridays);</p> <p>h. No loud music is permitted on site or in the Camp;</p>	Construction Contractor	<p>Monitoring Action:</p> <p>ECO to take photographs of site; Public Complaints Register; ECO Audit Checklist</p> <p>Responsible Person/Party:</p> <p>ECO & DEO</p> <p>Monitoring Frequency:</p> <p>Bi-Monthly</p>	

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	<p>i. Ensure that Employees and staff conduct themselves in an acceptable manner while on site, both during working hours and after hours; and,</p> <p>j. Vehicles are to abide by speed restrictions on access roads and limit trip generation so as to minimise disturbance to surrounding land users.</p>			
7.10	<p>Aspects: Fire Prevention.</p> <p>Impact: Uncontrollable fire.</p> <p>Objective: Prevent the outbreak of fires emanating from construction activity.</p> <p>Target: No incidences of fires are recorded for the site.</p>			
	<p>Mitigation/Management Measures:</p> <p>a. The potential risk of veld fires is heightened by windy conditions in the area, specifically during the dry, windy winter months;</p> <p>b. Assume acceptable precautions to guarantee that fires are not started as a result of works on site as specified below: the Contractor will be held responsible for any damage to structures or property on or neighbouring the Site as a result of any fire caused by personnel;</p> <p>c. The Contractor must ensure that construction related activities that pose a potential fire risk, such as welding etc., are properly managed and confined to areas where the risk of fires has been reduced. Measures to reduce the risk of fires include clearing working areas and avoiding working in high wind conditions when the risk of fires is greater. In this regard special care must be taken during the high risk dry, windy winter months;</p> <p>d. The Contractor must provide fire-fighting training to selected construction staff and take cognisance of the Veld and Forest Fire Act, Act No. 101, 1998;</p>	Construction Contractor	<p>Monitoring Action:</p> <p>ECO to take photographs of site before clearance; ECO Audit Checklist.</p> <p>Responsible Person/Party:</p> <p>ECO</p> <p>Monitoring Frequency:</p> <p>Bi-Monthly</p>	

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	<p>e. As per the conditions of the Code of Conduct, in the event of a fire being caused by construction workers and or construction activities, the appointed contractors must compensate farmers for any damage caused to their farms. The contractor must compensate the fire-fighting costs borne by farmers and local authorities;</p> <p>f. Equip vehicles and site structures with fire extinguishers. Rubber beaters must be stored on site;</p> <p>g. No open fires are allowed anywhere on site;</p> <p>h. In the event of a fire, the Contractor shall immediately employ such plant and personnel as is at his disposal and take all necessary action to prevent the spread of the fire and bring it under control;</p> <p>i. Storage of fuel or chemicals under trees is not permitted;</p> <p>j. Gas and liquid fuel is not to be stored in the same place;</p> <p>k. Smoking may only occur within a 3m radius from designated areas;</p> <p>l. Personnel must be adequately trained in the handling of firefighting equipment; and,</p> <p>m. Fuel, diesel, oil, or any other flammable substance must be stored 6m away from the smoking area.</p>			
7.11	<p>Aspects: Soil and water contamination due to construction activities such as the use of hazardous materials on site.</p> <p>Impact: Pollution of soil and water contamination by hazardous waste.</p> <p>Objective: Provide facilities for appropriate collection and disposal of hazardous waste.</p> <p>Target: No record of pollution or site contamination by hazardous waste.</p>	Construction Contractor	<p><u>Monitoring Action:</u></p> <p>Incident Register; Photographs; ECO Audit Checklist</p> <p><u>Responsible Person/Party:</u></p> <p>DEO & ECO</p>	
<p><u>Mitigation/Management Measures:</u></p> <p>a. Concrete must be mixed on mixing trays only and not on exposed soil. Concrete must be mixed only in areas which have been specially demarcated for this purpose (preferable where no natural vegetation occur);</p> <p>b. Concrete mixing to be carried out away from sensitive areas and on impermeable surfaces;</p>				

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<ul style="list-style-type: none"> c. Material Safety Data Sheets (MSDSs) must be available on site for all chemicals and hazardous substances to be used on-site, including information on their ecological impacts and how to minimise the impacts in case of leakage; d. All spillage must be cleaned up immediately after they have occurred; e. Spillage of petrochemical products must be avoided. In the case of accidental spillage, contaminated soil must be removed for bio-remediation or disposed of at a facility for the substance concerned. Disturbed land must be rehabilitated and seeded with vegetation seed naturally occurring on site; f. Do not locate any ablution facilities, sanitary convenience, septic tank or French drain within the 1:100 year flood line, or within a horizontal distance of 100m (whichever is greater) of a watercourse or drainage line; g. Vehicles and machinery must be regularly serviced to avoid leakages; h. At the work site the Contractor must maintain strict surveillance to ensure that no spills occur; i. No water courses may be used to clean equipment, or for bathing. All cleaning operations must take place off site at a location where waste water can be disposed of correctly; j. The discharge of any pollutants such as cement, concrete, lime, chemicals, etc. into the natural environment and the storm water system must strictly be prohibited; k. Fuel and chemical storage must be done within a designated area only, which is properly bund and able to contain 110% of the capacity of fuel or chemicals stored within; l. Construction vehicles must be inspected every morning before work commence to ensure that no leakages do occur; m. All personnel must receive induction on how to report spillages, contain them and treat them accordingly; n. Spill kits must be available at each working station; o. Drip trays must be placed beneath all construction equipment that is stationary on site or within the site camp; and, 		<p><u>Monitoring Frequency:</u> Bi-Monthly</p>	

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	p. Hazardous waste must be stored in bins with a lid in a demarcated waste area, and must be disposed of at a hazardous treatment facility with records on file.			
7.12	<p>Aspects: Water Conservation.</p> <p>Impact: Wasting water as a result of negligence.</p> <p>Objective: Promote and implement water use efficiency mechanisms.</p> <p>Target: No Water Wastage.</p> <p>Mitigation/Management Measures:</p> <ul style="list-style-type: none"> a. Re-use water where possible; b. Prevent leakages at taps and hoses by means of maintenance; c. Use buckets of water to clean tools instead of running water; d. Make sure that sediment, concrete, sand and rubbish does not end up going down the stormwater drain. Cover or filter stormwater inlets and drains; and, e. Require workers to use a broom rather than a hose to clean paths and gutters. If water use is necessary, use high pressure hoses which are both water efficient and more effective cleaners. 	Construction Contractor	<p>Monitoring Action:</p> <p>Incident Register; Photographs; ECO Audit Checklist</p> <p>Responsible Person/Party:</p> <p>ECO & DEO</p> <p>Monitoring Frequency:</p> <p>Bi-Monthly</p>	
7.13	<p>Aspects: Health and Safety.</p> <p>Impact: Dangerous working conditions for workers.</p> <p>Objective: To prevent any casualties on site.</p> <p>Target: No Personnel casualties on site.</p> <p>Mitigation/Management Measures:</p>	Construction Contractor	<p>Monitoring Action:</p> <p>Incident Register; Photographs; ECO Audit Checklist</p>	

CONSTRUCTION PHASE: PROPOSED DEVELOPMENT OF A HOUSING DEVELOPMENT ON ERF 3952 & 3975, HARTSWATER, NORTHERN CAPE PROVINCE		RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
	<p>a. Ensure that PPE is available to Personnel;</p> <p>b. Adhere to the Occupational Health and Safety Act;</p> <p>c. Keep the first aid kit stocked;</p> <p>d. Issue all workers with necessary health and safety items;</p> <p>e. Potentially hazardous areas must be demarcated with danger tape;</p> <p>f. Appropriate signage must be placed to caution Employees and contractors not to enter certain structures without Authorisation;</p> <p>g. Regular safety inspections must be conducted to ensure that participants are equipped with necessary safety equipment; and,</p> <p>h. All construction personnel to wear hard hats and reflector jackets at all times.</p>		<p>Responsible Person/Party: Contractor Health and Safety Representative</p> <p>Monitoring Frequency: Bi-Monthly</p>	
7.14	<p>Aspects: Heritage Resources.</p> <p>Impact: Damage and destruction of vertebrate fossils during excavation activities.</p> <p>Objective: To prevent any destruction of valuable artefacts.</p> <p>Target: No destruction of any vertebrate fossils and artefacts.</p> <p>Mitigation/Management Measures:</p> <p>a. Should any heritage resources (including but not limited to fossil bones, coins, indigenous and/or colonial ceramics, any articles of value or antiquity, stone artefacts or bone remains, structures and other built features, rock art and rock engravings) be exposed during excavation for the purpose of construction, construction in the vicinity of the finding must be stopped. A trained palaeontologist or heritage specialist must be notified to assess the finds, and this must then be reported to the applicable heritage authority;</p>	Construction Contractor	<p>Monitoring Action: Incident Register; Photographs; ECO Audit Checklist</p> <p>Responsible Person/Party: DEO & ECO</p> <p>Monitoring Frequency:</p>	

CONSTRUCTION PHASE: PROPOSED DEVELOPMENT OF A HOUSING DEVELOPMENT ON ERF 3952 & 3975, HARTSWATER, NORTHERN CAPE PROVINCE		RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	<u>MONITORING:</u> ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIAN T? (for use by ECO)
	<p>b. Heritage remains uncovered or disturbed during earthworks must not be disturbed further until the necessary approval has been obtained from the heritage authority. A registered heritage specialist must be called to the site for inspection and removal once authority to do so, has been given;</p> <p>c. Excavations must be limited to the footprint area and be maintained in a narrow corridor;</p> <p>d. All operations of excavation equipment must be made aware of the possibility of the occurrence of sub-surface heritage features and the following procedures must be followed:</p> <p>a. All construction in the immediate 50 m vicinity radius of the site must cease;</p> <p>b. The heritage practitioner must be informed as soon as possible;</p> <p>c. In the event of obvious human remains SAPS must be notified;</p> <p>d. Mitigation measures (such as refilling, etc.) must not be attempted;</p> <p>e. The area in a 50 m radius of the find must be cordoned off with hazard tape;</p> <p>e. Public access must be limited and the area must be placed under guard;</p> <p>f. The Furnace area must be protected and declared a no-go area until the developer appoints a suitably qualified archaeologist to conduct a Phase 2 archaeological assessment of the terrain and to draw up a heritage management plan for the site; and,</p> <p>g. The appointed archaeologist must apply for a valid permit from SAHRA to excavate the furnace for display and educational purposes.</p>		Bi-Monthly	
7.15	<p>Aspects: Water Quality of the nearby canal.</p> <p>Impact: The irrigation canal can potentially be at risk to increased surface runoff due to change in surface texture and effluent from the housing development.</p>	Construction Contractor	<p><u>Monitoring</u> <u>Action:</u></p> <p>Incident Register; Photographs; ECO</p>	

<p align="center">CONSTRUCTION PHASE: PROPOSED DEVELOPMENT OF A HOUSING DEVELOPMENT ON ERF 3952 & 3975, HARTSWATER, NORTHERN CAPE PROVINCE</p>	<p align="center">RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)</p>	<p align="center">MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY</p>	<p align="center">COMPLIANT? (for use by ECO)</p>
<p>Objective: To prevent sediment and hazardous materials from entering the nearby canal.</p> <p>Target: Water quality must remain unaltered.</p> <p>Mitigation/Management Measures:</p> <ul style="list-style-type: none"> a. Provision of adequate on-site sewerage management; b. Sewerage and sanitation facilities should be regularly maintained and checked; c. An integrated waste management programme must be compiled for the development; d. Sufficient waste receptacles should be placed around the development in order to encourage people to use them; e. The principle of reduce, re-use and recycle should be followed; f. The construction site should be kept clean and tidy; g. Any waste should be disposed in a registered landfill and not be allowed to be dumped in the surrounding landscape; h. All surfaces used for waste storage and loading areas should have an impermeable surface; i. Avoid the use of concrete lined channels for stormwater management as this can increase the speed of water. This in turn increases erosion potential that can cause erosion on site and increase siltation downstream. If concrete lined channels are used, they should end in silt traps; j. Structures must be inspected regularly for the accumulation of debris, blockages, instabilities and erosion with continual remedial and maintenance actions; k. Regular inspections will be undertaken of any access roads and stormwater management drains for signs of erosion and sedimentation; l. Regularly inspect all construction vehicles for leaks. Re-fuelling of vehicles must take place on a sealed surface area 		<p>Audit Checklist</p> <p>Responsible Person/Party: DEO & ECO</p> <p>Monitoring Frequency: Bi-Monthly</p>	

<p align="center">CONSTRUCTION PHASE: PROPOSED DEVELOPMENT OF A HOUSING DEVELOPMENT ON ERF 3952 & 3975, HARTSWATER, NORTHERN CAPE PROVINCE</p>		<p align="center">RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)</p>	<p align="center"><u>MONITORING:</u> ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY</p>	<p align="center">COMPLIAN T? (for use by ECO)</p>
	<p>surrounded by berms to prevent ingress of hydrocarbons into the topsoil;</p> <p>m. No dumping of waste or any other materials is allowed within any stormwater canals or the irrigation canal;</p> <p>n. If any spills occur, they should be immediately cleaned up;</p> <p>o. If water is sprayed on the construction surface for any reason during the construction process, utmost care must be taken to ensure the runoff water does not pollute the irrigation canal;</p> <p>p. Spill kits must be stored on site. In case of accidental spills of oil, petroleum products etc., good oil absorbent materials must be on hand to allow for the quick remediation of the spill. The kits should be well marked and all personnel should be educated to deal with the spill. Vehicles must be kept in good working order and leaks must be fixed immediately on an oil absorbent mat. The use of a product such as Sunorb is advised;</p> <p>q. Removed soil and stockpiling of soil must occur outside the extent of canals and water affected areas to prevent siltation and increased runoff during construction; and,</p> <p>r. Proper ablution facilities must be available during the construction and decommissioning phases. The impact of human waste on the system is immense. Chemical toilets must be provided which should always be well serviced and spaced as per the occupational health and safety laws, and placed outside one hundred meters (100 m) from any watercourses.</p>			
<p>7.16</p>	<p>Aspects: Spread and establishment of Alien and Invasive Species.</p> <p>Impact: Soil disturbances from construction will enhance the encroachment of Alien and Invasive vegetation that will out compete indigenous counterpart species for resources, displace and reduce faunal and flora biodiversity. Clearing current Invasive Alien species will increase the risk of spreading species if not properly removed and safely transported.</p> <p>Objective: Prevent Alien and Invasive growth on site.</p> <p>Target: Eradication of Alien and Invasive Species on site.</p>	<p>Construction Contractor</p>	<p>Monitoring Action:</p> <p>Incident Register; Photographs; ECO Audit Checklist</p> <p>Responsible</p>	

CONSTRUCTION PHASE: PROPOSED DEVELOPMENT OF A HOUSING DEVELOPMENT ON ERF 3952 & 3975, HARTSWATER, NORTHERN CAPE PROVINCE		RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
a.	Alien plant material removed during construction and eradication efforts should be contained and disposed of properly to limit accidental spread;		Person/Party: DEO & ECO	
b.	Construction activities must be limited to the smallest possible area;			
c.	Designated authorised service roads must be used by all Construction vehicles; and,		Monitoring Frequency: Bi-Monthly	
d.	On-going Alien and Invasive vegetation removal should take place in and around the development footprint.			

9.2 Operational Phase Environmental Management Programme

The intention of providing an EMP'r for the operational phase is to provide guidelines for management of facilities and infrastructure to safeguard the environment against negative environmental impacts.

OPERATIONAL PHASE: PROPOSED DEVELOPMENT OF A HOUSING DEVELOPMENT ON ERF 3952 & 3975, HARTSWATER, NORTHERN CAPE PROVINCE		RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
1. ACTIVITY: OPERATIONAL PHASE IMPACTS				
1.1	<p>Aspects: Noise Generation.</p> <p>Impact: Noise nuisance from maintenance work.</p> <p>Objective: To avoid excessive noise generation from maintenance work.</p> <p>Target: Minimise the incidence of noise generation.</p>	Applicant	<p>Monitoring Action:</p> <p>Residents to adhere to the curfew.</p>	

OPERATIONAL PHASE: PROPOSED DEVELOPMENT OF A HOUSING DEVELOPMENT ON ERF 3952 & 3975, HARTSWATER, NORTHERN CAPE PROVINCE		RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
	<p>Mitigation/Management Measures:</p> <ul style="list-style-type: none"> a. Limit working hours of noisy equipment to daylight hours; b. The body corporate must implement a curfew for loud music. Should residence not adhere to the curfew, they must pay a fine. The amount will be determined by the body corporate; and, c. Ensure the employees and maintenance staff conduct themselves in an acceptable manner while on site, both during work hours and after hours. 		<p>Responsible Person/Party: Body Corporate</p>	
1.2	<p>Aspects: Handling of general – and hazardous waste materials on the developed site.</p> <p>Impact: Due to increase in homeowners within the area, waste will be generated on site.</p> <p>Objective: Management and disposal of general – and hazardous waste in an appropriate manner.</p> <p>Target: No record of pollution or site contamination by solid waste.</p> <p>Mitigation/Management Measures:</p> <ul style="list-style-type: none"> a. Waste generated from the complex need to be stored in a designated storage area. The storage area must be covered with a roof and surrounded by brick walls in order to ensure that it can't be impacted upon by water and wind; b. The storage area need to be placed in an area easily accessible to the Municipality for collection; c. Residents need to be encouraged to sort all recyclable waste. A two bag system can be implemented by the Body Corporate; d. The waste storage area should have a lockable door on the outside to ensure that waste pickers do not pollute the surrounding area through the sorting of waste in the street; and, e. Waste must be removed by the Municipality or a licensed Contractor appointed by the Local Community. 	Applicant	<p>Monitoring Action: Maintenance Contractor Checklist</p> <p>Responsible Person/Party: DEO</p> <p>Monitoring Frequency: Once maintenance activities are conducted.</p>	

OPERATIONAL PHASE: PROPOSED DEVELOPMENT OF A HOUSING DEVELOPMENT ON ERF 3952 & 3975, HARTSWATER, NORTHERN CAPE PROVINCE		RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
1.3	<p>Aspects: Traffic.</p> <p>Impact: Traffic impacts associated with the movement of vehicles within the area.</p> <p>Objective: Non-disturbance of current traffic volumes and routes.</p> <p>Target: No accidents within the immediate vicinity from the proposed development or traffic jams.</p> <p>Mitigation/Management Measures:</p> <p>a. Rather than using a bare mono-steel pole it is recommended that a tower disguised as a tree be used as is the case with other cellular mast in the area; and,</p> <p>b. Any potential bird collision and associated mortalities must be monitored and recorded on an ongoing basis. Should any mortalities be recorded, records must be reviewed by an avifaunal specialist (e.g. Endangered Wildlife Trust) to determine if any further investigation or specific mitigation measures are needed.</p>	Applicant	<p>Monitoring Action: Regular inspection.</p> <p>Responsible Person/Party: Applicant</p> <p>Monitoring Frequency: Monthly</p>	
1.4	<p>Aspects: Soil and water contamination due to operational activities such as the use of effluent on site.</p> <p>Impact: Pollution of soil and water contamination by hazardous waste.</p> <p>Objective: Provide facilities for appropriate collection and disposal of hazardous waste.</p> <p>Target: No record of pollution or site contamination by hazardous waste.</p> <p>Mitigation/Management Measures:</p> <p>a. It should be ensured that all associated infrastructure (sewerage pipes) operate within their design measure. Should it happen that a pipe is blocked/leaking it must be reported to the Municipality at once to ensure that effluent does not drain into the natural environment;</p> <p>b. The waste area must be properly bund to ensure that no natural water can enter the storage area;</p>	Applicant	<p>Monitoring Action: Regular inspection of all infrastructure on site.</p> <p>Responsible</p>	

OPERATIONAL PHASE: PROPOSED DEVELOPMENT OF A HOUSING DEVELOPMENT ON ERF 3952 & 3975, HARTSWATER, NORTHERN CAPE PROVINCE		RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
	<p>c. All effluent generated from households must be disposed of into the Municipal network; and,</p> <p>d. Stormwater should be implemented in such a manner that dirty water is diverted into the Municipal network and not into the natural canal.</p>		<p>Person/Party: Applicant</p> <p>Monitoring Frequency: Monthly</p>	
1.5	<p>Aspects: The development may lead to higher criminal activities in the area.</p> <p>Impact: Due to the high concentration of residents and business properties on Erf 3952 & 3975 criminals may be drawn to the area.</p> <p>Objective: Protect all residents and properties from criminal activities.</p> <p>Target: No criminal activities within the immediate vicinity from the proposed development.</p>			
	<p>a. The Local Community should start a neighbourhood watch, if there is not an existing one;</p> <p>b. Adequate security must be provided to ensure no irregular movements occur within the area; and,</p> <p>c. The Department of Police, Roads and Transport have been notified of the project and the neighbourhood/security contractor should liaise with the Department if any criminal activities take place within the area.</p>	Applicant	<p>Monitoring Action: Complaints Register</p> <p>Responsible Person/Party: Applicant</p> <p>Monitoring Frequency: Bi-annually</p>	

9.3 Impacts during the Decommissioning Phase

The activity will not be decommissioned in the future and therefore the proposed impacts therefore were not assessed.

10 EMERGENCY RESPONSE PLAN

The following table is provided to assist the ECO and construction Contractor with remedial work options and problem solving:

Observation or Event	Action by Inspector or Observer	Action by Construction Contractor
<p>Spillage of diesel or hydrocarbons on soil</p>	<p>Report to construction Contractor and continue observations.</p> <p>Also check:</p> <ul style="list-style-type: none"> ➤ That the source causing the spillage has ceased, and that the affected area is isolated to prevent spreading of the hazardous substance, where after it must be rehabilitated. 	<p>Action will be required as soon as possible (ASAP) by following the next steps:</p> <ul style="list-style-type: none"> ➤ Dig down into the soil to see how far down the pollution penetrated, ➤ If less than 300mm penetrated: <ul style="list-style-type: none"> a. Turn the soil over to expose it to the air. b. Apply Mono Ammonium Phosphate (MAP) at a rate of 58gr/m² to the overturned soil. c. Water enough to keep the soil moist. ➤ If penetration is greater than 300mm: <ul style="list-style-type: none"> a. Remove the affected soil and spread in a layer not more than 300mm thick. b. Apply MAP at a rate of 50gr/m². c. Water enough to keep the soil moist. ➤ Repeat the above steps every 6 weeks or until the soil is clean.
<p>Erosion</p>	<p>Report to construction contractor and continue observations.</p> <p>Also check:</p> <ul style="list-style-type: none"> ➤ That all vehicular movement is restricted to existing access routes to prevent crisscrossing of 	<p>Action will be required ASAP:</p> <ul style="list-style-type: none"> ➤ Implement erosion protection works at identified problem areas. ➤ Implement remedial works at affected areas in order to restore the area to its previous or better status.

Observation or Event	Action by Inspector or Observer	Action by Construction Contractor
	tracks through undisturbed areas.	

11 INCIDENT REGISTER

INCIDENT REGISTER: PROPOSED DEVELOPMENT OF A HOUSING DEVELOPMENT ON ERF 3952 AND 3975, HARTSWATER, NORTHERN CAPE PROVINCE					
NAME OF PERSON REPORTING THE INCIDENT	INCIDENT	DATE OF INCIDENT IDENTIFIED	HOW WAS INCIDENT ADDRESSED?	DATE OF RECTIFICATION	SIGNATURE

12 REHABILITATION MEASURES AND CLOSURE PLAN

The rehabilitation phase follows completion of construction works and entails site clean-up and site rehabilitation following the removal of the Contractor from site. The underlying aim of rehabilitation is the process of returning land within the site boundary to some degree of its former natural state.

Key aspects within this process include the:

- Removal of structures and infrastructure;
- Handling of inert waste and rubble;
- Handling of hazardous waste and pollution control;
- Final shaping of the terrain;
- Topsoil replacement and soil amelioration;
- Ripping and scarifying of surfaces;
- Planting of indigenous occurring vegetation (if deemed necessary); and
- Maintenance.

12.1 Rehabilitation Measures

Removal of structures and infrastructure
<ul style="list-style-type: none"> • On completion of a section of works, the area must be rehabilitated by suitable landscaping, levelling, topsoil dressing, land preparation, alien plant eradication and where ascribed for by the ECO, vegetation establishment; • Clear and completely remove from site all construction structures and temporary infrastructure; • All permanent infrastructure must be returned to a useable state.
Inert waste and rubble
<ul style="list-style-type: none"> • Remove all inert waste and rubble, such as excess rock, any structural foundations and remaining aggregates. Only once this material has been removed, the site shall be re-instated and rehabilitated. • Domestic waste must be completely removed from the site and disposed of at a landfill site.
Topsoil replacement and soil amelioration
<ul style="list-style-type: none"> • The reinstatement of disturbed areas must follow immediately after the removal of structures and temporary infrastructure; • Topsoil backfilling must be undertaken when the soil is dry, and not following any recent rainfall events; • The replacement of topsoil must be sought in situ with construction where possible, or as soon as construction in an area has be completed; • All stockpiled topsoil together with herbaceous vegetation must be replaced and redistributed over a disturbed area such as temporary access roads; • Topsoil must be returned to the same site from where it was stripped; • When insufficient topsoil remains, soil of a similar quality can be obtained from a nearby area within the

construction area which was disturbed;

- Once topsoil has been returned to the ground, stripped vegetation must be randomly spread by hand over the area.

Maintenance

- All re-growth of invasive vegetative material will be monitored by the Developer for one year;
- All areas under rehabilitation are to be treated as no-go areas using danger tape and steel droppers/fencing and cordoned off, to prevent vehicular, pedestrian and livestock access.
- Any re-vegetation must be done using plant species in occurrence on site;
- Control invasive plant species and weeds using approved methods of manual or chemical intervention;
- The re-establishment of vegetation must be allowed several rainy seasons, given the arid nature of the climate and region.