

19/07/2017

Environmental Management Programme

PROJECT TITLE: ESTABLISHMENT OF PROPOSED HOUSING DEVELOPMENT (TO BE KNOWN AS MARAPONG EXTENSION 7) LOCATED ON THE REMAINDER AND PORTION 1 OF THE FARM NELSONSKOP 464 LQ, LEPHALALE LOCAL MUNICIPALITY, WATERBERG DISTRICT, LIMPOPO PROVINCE

TEKPLAN ENVIRONMENTAL CC

DOCUMENT DESCRIPTION:

Environmental Management Programme

PROJECT TITLE: ESTABLISHMENT OF PROPOSED HOUSING DEVELOPMENT (TO BE KNOWN AS MARAPONG EXTENSION 7) LOCATED ON THE REMAINDER AND PORTION 1 OF THE FARM NELSONSKOP 464 LQ, LEPHALALE LOCAL MUNICIPALITY, WATERBERG DISTRICT, LIMPOPO PROVINCE

DOCUMENT NUMBER: 1

DOCUMENT VERSION: Draft

DOCUMENT ISSUE DATE: 19/07/2017

AUTHOR: Mr. D. Combrink

RESPONSIBLE PARTY/PERSON: Mrs. Filomaine Swanepoel
Exxaro Coal (Pty) Ltd -
Grootegeluk
P.O. Box 178
Lephalale
0555

COMPILED BY: 014 763 9000



CONTENTS LIST:

ACRONYMS

DEFINITIONS

ENVIRONMENTAL MANAGEMENT PROGRAMME

1. INTRODUCTION

- 1.1. Environmental Assessment Practitioner
- 1.2. Mitigation and Responsibilities

2. WHAT IS AN EMP_r?

3. GEOGRAPHIC SCOPE OF THIS EMP_r

4. TIME FRAME OF THIS EMP_r

5. EMP TO INFORM PLANNING

6. ENVIRONMENTAL AWARENESS PLAN

- 6.1. EMP_r to contractors
- 6.2. Incorporate Recommendations into Construction Contracts

7. NOTIFYING THE PUBLIC

8. RECOMMENDED ENVIRONMENTAL IMPACT MANAGEMENT MEASURES

8.1. Planning phase mitigation guidelines

- 8.1.1. Implementation recommendations
- 8.1.2. The destruction of natural vegetation and temporary displacement of fauna from the area during initial investigations)
- 8.1.3. Visual impact of the development
- 8.1.4. Cultural and/or archaeological sites
- 8.1.5. Surface water
- 8.1.6. Architecture and landscaping

8.2 Construction phase mitigation guidelines

- 8.2.1 Impacts on the physical environment
 - 8.2.1.1. Earthworks
 - 8.2.1.2. Vehicular access and movement of construction vehicles
 - 8.2.1.3. Contractors' yards
 - 8.2.1.4. Ground Water and Soil Pollution
 - 8.2.1.5. Waste
 - 8.2.1.6. Soil Pollution

- 8.2.1.7. Soil and Groundwater Pollution
- 8.2.1.8. Stormwater and erosion control
- 8.2.1.8. Stormwater and erosion control
- 8.2.1.9. Surface water contamination
- 8.2.1.10. Pollution of groundwater (subterranean aquifer)
- 8.2.1.11. Noise
- 8.2.1.12. Fires
- 8.2.1.13. Cleanliness
- 8.2.1.14. Air Pollution – dust and smoke
- 8.2.1.15. Visual impact of construction
- 8.2.1.16. Rehabilitate compacted soils
- 8.2.2 Impacts on the biological environment
 - 8.2.2.1. Terrestrial ecology – vegetation
 - 8.2.2.2. Terrestrial ecology – fauna
- 8.2.3 Impacts on the social and economic environment
 - 8.2.3.1. Safety
 - 8.2.3.2. Clean construction camp
 - 8.2.3.3. Cultural and/or archaeological environment
 - 8.2.3.3. Cultural and/or archaeological environment
 - 8.2.3.4. Optimisation of the local economy
 - 8.2.3.5. Unsocial activities on site

8.3 Operational phase mitigation guidelines

- 8.3.1. The bio-physical environment
- 8.3.2. Solid waste disposal
- 8.3.3. Water usage
- 8.3.4. Effluent
- 8.3.5. Alien species control
- 8.3.6. Induced traffic
- 8.3.7. Lighting

8.4. Decommissioning Phase

9. MONITORING & REPORTING

- 9.1. Compliance Monitoring (Regulatory Permit Monitoring)
- 9.2. Generic Monitoring Process
- 9.3. Writing a Monitoring Report
- 9.4. Instituting Corrective Action, Continual Improvement and Preventative Measures

10. CONCLUDING REMARKS

11. MAP

12. APPENDICES

13. REFERENCES

ACRONYMS

LEDET	Limpopo Department of Economic Development, Environment & Tourism
EMPR	Environmental Management Programme
I&AP	Interested and/or affected party (i.e. the public, adjacent landowners and the property owner)
ROD	Record of Decision
EA	Environmental Authorisation
ECO	Environmental Compliance Officer
EO	Environmental Officer
EM	Environmental Manager

DEFINITIONS

DEFINITIONS

For the purpose of this document, the following definitions apply:

Audit

A systematic and, wherever possible, independent examination to determine whether activities and related results conform to planned arrangements and whether these arrangements are implemented effectively and are suitable to achieve the organisation's policy and objectives

Continual improvement

Process of enhancing the environmental management programme to achieve improvements in overall environmental performance in line with the organisation's environmental policy

Documentation

Any written information describing, defining, specifying, certifying or reporting activities, requirements, policy or results

Environment

Surroundings in which the organisation operates, including air, water, land, natural resources, flora, fauna, humans, and their interaction

NOTE: Surroundings in this context extend from within an organisation to the global system.

Environmental aspect

Element of an organisation's activities, products or services that can interact with the environment

NOTE: A significant environmental aspect is an environmental aspect that has or can have a significant environmental impact.

Environmental impact

Any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organisation's activities, products or services.

Environmental Management Programme

A guideline document or directive, forming part of the overall management system, outlining the mitigation, monitoring and institutional measures to be taken during the;

- project implementation phase,
- project construction phase, and
- project operational phase,
- to avoid or control adverse environmental impacts – also including the actions needed to implement these measures.

Environmental objective

Overall environmental goal, arising from the environmental policy, that an organisation sets itself to achieve, and which is quantified where practicable.

Environmental performance

Measurable results of the environmental management system, related to an organisation's control of its environmental aspects based on its environmental policy, objectives and targets.

Environmental policy

Statement by the organisation of its intentions and principles in relation to its overall environmental performance which provides a framework for action and for the setting of its environmental objectives and targets

Environmental target

Detailed performance requirement, quantified where practicable, applicable to the organisation or parts thereof, that arises from the environmental objectives and that needs to be set and met in order to achieve those objectives.

Hazard

A source or a situation with a potential for harm in terms of human injury or ill-health, damage to property, damage to the work place environment, or a combination of these.

Hazard Identification

The process of recognising that a hazard exists and defining its characteristics

Incident

Undesired event that has the potential to lead to an accident

NOTE: Term "incident" includes both accidents as well as no-loss incidents, called "near-misses".

Inspection

Examination or measurement to verify whether an item or activity conforms to specified requirements, using the techniques of quality control.

Interested party

Individual or group concerned with or affected by the environmental performance of an organisation.

Mitigation measures

Mitigation measures encompass all actions taken to eliminate, offset or reduce potentially adverse environmental impacts to acceptable levels (World Bank, 1999:1).

Occupational Exposure

Occupational Exposure of adult workers who may be exposed to EMF under controlled conditions, in the normal course of and intrinsic to their particular employment. These workers will have been made aware of the potential risks of exposure and they will be able to take appropriate precautions.

Organisation

Company, corporation, firm, enterprise, authority or institution, or part or combination thereof, whether incorporated or not, public or private, that has its own functions and administration.

NOTE: For organisations with more than one operating unit, a single operating unit may be defined as an organisation.

Qualified Personnel

Characteristics or abilities gained through education, training and/or experience which enables an individual to carry out a specific task in accordance with specific requirements.

Risk

The combination of predicted frequency and consequences of a specified undesired event occurring due to the realisation of a hazard

Risk Assessment

The overall process of estimating the magnitude of risk and deciding whether or not the risk is tolerable

Safety

Freedom from unacceptable risk or harm

Site (also “The Site”)

All physical locations where contractors & sub-contractors will be performing tasks related to the tender/project allocated to them.

Tolerable Risk

A risk that has been reduced to a level that can be endured by the organisation having regard to its legal obligations and its own Occupational Health & Safety policy

Work Instructions

A document which sets out how a particular task is to be done, what is required and how it shall be recorded

ENVIRONMENTAL MANAGEMENT PROGRAMME

1. INTRODUCTION

1.1. Environmental Assessment Practitioner

This Environmental Management Programme was compiled by:

TEKPLAN Environmental
P.O. Box 55714
POLOKWANE
0700

Tel: 015 291 4177
Fax: 086 218 3267
Email: tecoplan@mweb.co.za

Contact person: Mr. Danie Combrink (B.Sc. Geography; B.Sc. (Hons) Geography
(Specializing in Environmental Management & Analyses))

1.2. Mitigation and Responsibilities

Mitigation seeks to find better ways of doing things, minimise or eliminate negative impacts, enhance project benefits and protect public and individual rights. The applicant/proponent has a responsibility to avoid or minimise impacts, and plan for managing impacts.

This section of the report serves to prescribe measures to reduce, limit, eliminate or compensate for impacts, to acceptable/insignificant levels. The term 'mitigate' means to '*allay, moderate, palliate, temper, intensify*'. In environmental terminology this term is used as follows:

- mitigation of a negative impact;
- to reduce the significance of an impact;
- mitigation/optimization of a positive impact;

Hereunder the potential to mitigate each of the negative impacts identified will be discussed. Certain mitigation measures will be proposed and an indication will be given of how these proposed mitigation measures will influence the significance and status of each identified impact. Recommendations are arranged in order of sequence i.e. Planning/construction and Operational phases.

Mitigation should permeate through all stages of the development process. It is also essential that the mitigation plan be monitored during the construction and operational phases, to ensure compliance. An Environmental Control Officer (ECO) will be appointed to report to DEDET on a regular basis regarding compliance of the EMPr.

The stipulations of this report should be conveyed to contractors and persons responsible for construction. The Applicant (Exxaro Coal (Pty) Ltd - Grootegeluk) in collaboration with the duly appointed contractor(s) will be responsible for the implementation of this EMPr. This mitigation section should be issued as a stand along document to all parties involved with the planning, implementation and operation of the proposed project.

2. WHAT IS AN EMPr?

It is essential to develop measures to eliminate, offset or reduce impacts on the environment, to acceptable levels before the implementation and operational phases of a project commence. The integration of such measures to protect the environment during the implementation and operational phase of a project, can be done by clearly defining environmental requirements within an Environmental Management Programme (or EMPr) (World Bank, 1999:1).

EMPr's provide a link between 1) the predicted environmental impacts (that will be induced by a certain development/project), and 2) implementation and operational activities.

Generally an EMPr performs the following functions;

- it outlines the anticipated environmental impacts of a project,
- it outlines the measures to be taken to mitigate these impacts,
- it outlines responsibilities for mitigation of impacts.

Definition of an "Environmental Management Programme" (EMPr):

An EMPr is a guideline document/directive outlining the mitigation, monitoring and institutional measures to be taken during project implementation, construction and operation to avoid or control adverse environmental impacts, as well as the actions needed to implement these measures (World Bank, 1999:1).

Definition of “mitigation measures”:

Mitigation measures encompass all actions taken to eliminate, offset or reduce potentially adverse environmental impacts to acceptable levels (World Bank, 1999:1).

3. GEOGRAPHIC SCOPE OF THIS EMPr

This EMPr shall apply to all areas that will be affected by activities that will be undertaken with regard to the proposed residential development (to be known as Marapong Extension 7), located on the Remainder and Portion 1 of the farm Nelsonskop 464 LQ, Lephalale Municipality area, Limpopo Province (including proposed bulk pipeline across the Remainder of the farm Zongesien 467 LQ to the Zongesien WWTP).

4. TIME FRAME OF THIS EMPr

This EMPr shall apply to all actions that will be undertaken with regard to the proposed Marapong Ext.7 between the date of issuing of the Environmental Authorization and the date of completion of construction.

5. EMP TO INFORM PLANNING

During planning and design, the proponent and its planning consultants and contractors, should take into account the recommendations of this EMPr so that it is positively utilised on a pro-active basis to aid in the mitigation of impacts.

6. ENVIRONMENTAL AWARENESS PLAN

6.1. EMPr to contractors

The stipulations of this mitigation plan (EMPr) should be conveyed to contractors prior to the commencement of construction. This can be done during the Site Handover Meeting. Contractors should acknowledge receipt thereof in writing (this can be achieved by including this EMPr as an annexure to the tender documents).

6.2. Incorporate Recommendations into Construction Contracts

Construction-phase mitigation guidelines and clauses should be written into contract documents as specifications, in addition to the minimum requirements as set out in the SABS Standardised Specification for Civil Engineering Construction.

Additional clauses should be added as necessary in response to specific impacts that

may be identified during the detailed design stage.

7. NOTIFYING THE PUBLIC

Adjacent land owners and the public at large, shall be informed of the fact that construction activities will take place at the site (personal letters of notification and advertising in the written media, should be used as the means of notification).

8. RECOMMENDED ENVIRONMENTAL IMPACT MANAGEMENT MEASURES

8.1. Planning phase mitigation guidelines

8.1.1. Implementation recommendations

- During further planning and design stages, the developer and its planning consultants and contractors, should take into account the recommendations of this Environmental Management Programme (EMPr), so that it is positively utilised on a pro-active basis to aid in the mitigation of impacts.

8.1.2. The destruction of natural vegetation and temporary displacement of fauna from the area during initial investigations)

Activity	Mitigation Measures	Responsible	Time Frame
Initial investigations	<ul style="list-style-type: none"> • When visiting the site during the planning phase, use should be made of existing access roads. • During the environmental impact study, sampling of vegetation rather than outright removal of existing plant material should take place (and then only if essential). 	The developer and its planning consultants and contractors	During planning/pre-construction phase

8.1.3. Visual impact of the development			
Activity	Mitigation Measures	Responsible	Time Frame
Planning of township components	<ul style="list-style-type: none"> Retain existing trees as far as possible to minimize visual impact. Communal facilities in the proposed development should be architect designed so as to blend in with the prevailing architectural character of the area. 	The developer and its planning consultants and contractors	During planning/pre-construction phase

8.1.4. Cultural and/or archaeological sites			
Activity	Mitigation Measures	Responsible	Time Frame
Planning of township components	<ul style="list-style-type: none"> In the case of an archaeological/heritage resources “find”, the layout plan of the proposed township should be amended in order that these “heritage sites” are not further disturbed. All graves shall be relocated in accordance with the stipulations of the South African Heritage Resources Act and its relevant regulations pertaining to graves. 	The developer and its planning consultants and contractors	During planning/pre-construction phase

8.1.5. Surface water			
Activity	Mitigation Measures	Responsible	Time Frame
Planning of township components	<ul style="list-style-type: none"> Storm water that originates on the site will be channelled via a conventional drainage system consisting of open side channels next to streets towards the adjacent manmade drainage channel The construction of suitable outlet structures (i.e. where collected stormwater will be discharged into water courses/existing storm water channels), should be done, so as to prevent erosion at the point of discharge. It is also recommended that measures be implemented at the outlet structures, to prevent solid waste from being washed into the water course/existing storm water channels where the collected stormwater will be discharged (e.g. grids should be installed at the outlet structures). 	The developer and its planning consultants and contractors	During planning/pre-construction phase

8.1.6. Architecture and landscaping			
Activity	Mitigation Measures	Responsible	Time Frame
Architecture and landscaping	<ul style="list-style-type: none"> Communal facilities in the proposed development should be architect designed so as to blend in with the prevailing architectural character of the 	The developer and its planning consultants and	During planning/pre-construction phase

	<p>area.</p> <ul style="list-style-type: none"> • Only permit the planting of indigenous trees within the township, especially on road reserves, parks and other communal facilities, • Use plants for landscaping which have low water requirements (indigenous plants normally require less watering compared to imported varieties). 	contractors	
--	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------	--

8.2 Construction phase mitigation guidelines

8.2.1 Impacts on the physical environment

8.2.1.1. Earthworks			
Activity	Mitigation Measures	Responsible	Time Frame
Excavation activities	<ul style="list-style-type: none"> • All excavation activities for any purpose whatsoever, should be preceded by selective stripping and stockpiling of vegetative (humus) and soil materials in the order of their horizons as found on site, for the purpose of replacement in the appropriate horizon order, after the completion of construction. These activities should include; <ul style="list-style-type: none"> ☞ trenching for the installation of services 	Contractors responsible for construction	During construction phase

	<p>(e.g. electricity),</p> <ul style="list-style-type: none"> ☞ foundations, ☞ access road construction, ☞ site clearance, ☞ borrow pits, ☞ yards or laydown areas or any other areas affecting the natural environment. <ul style="list-style-type: none"> • Replacement and rehabilitation should be progressive with the construction and not left until the end. Temporary topsoil stockpiles should be seeded, or protected in a manner acceptable to the environmental planner, so as to avoid erosion by rain or wind. Stockpiling of removed earth (separately) should take place and be returned for backfilling in the correct soil horizon order. • Stockpiled topsoil and subsoils should be protected from contamination e.g. by fuel spillages etc. • When conducting excavations, all excavation sidewalls should be left open for a period in excess of 24 hours to ensure the safety of workers. • It is recommended that on site inspections of open foundation trenches 		
--	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--	--

	for the construction of structures be conducted by a qualified engineering geologist or geo-technical engineer in order to identify and evaluate soil conditions at variance with those encountered during the investigation.		
--	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--	--

8.2.1.2. Vehicular access and movement of construction vehicles			
Activity	Mitigation Measures	Responsible	Time Frame
Vehicular access and movement of construction vehicles	<ul style="list-style-type: none"> • Damping down of unsurfaced roads should take place to limit the creation of airborne dust. • Posting of relevant traffic signage should take place in order to inform motorists of the turning movements of construction vehicles. • The access of all construction and delivery vehicles to construction areas should be strictly controlled, especially during wet weather, to avoid compaction and damage to the topsoil structure. • Planning of site delivery hours to avoid peak hour traffic, weekends and evenings. Adverse impacts from 	Contractors responsible for construction and site engineer	During construction phase

	<p>construction traffic can be minimised by good planning by the contractor and controlled site activities.</p> <ul style="list-style-type: none"> • Construction routes to be clearly defined and signed. • Working hours to be controlled by site engineer. 		
--	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--	--

8.2.1.3. Contractors' yards			
Activity	Mitigation Measures	Responsible	Time Frame
Contractors' yards	<ul style="list-style-type: none"> • Material delivery and storage areas should be demarcated in co-ordination with the contractor. Material should not be brought onto a site prematurely, which could result in additional areas being cleared or affected. • Materials storage and contractors yards should not be sited in areas of sensitive soils, wherever practically possible, i.e. alluvial soils, drainage lines or vleis, steep slopes, rocky outcrops and those susceptible to erosion. Site activities should be properly managed and located not closer than 200m to streams/drainage channels. 	Contractors responsible for construction, site engineer and ECO	During construction phase

8.2.1.4. Ground Water and Soil Pollution			
Activity	Mitigation Measures	Responsible	Time Frame
Toilet facilities	The use of portable chemical toilets for use by the labour force, is essential to avoid pollution and attraction of vermin and flies (which could become a nuisance or a health hazard).	Contractors responsible for construction	During construction phase

8.2.1.5. Waste			
Activity	Mitigation Measures	Responsible	Time Frame
Waste handling	<ul style="list-style-type: none"> • Contractors should remove all waste generated by themselves during construction and it should be disposed of at a suitable solid waste disposal venue – “dumping in the bush” should not take place. • No materials or pollutants, etc. shall be dumped on site, adjacent thereto, or in any other place. • Waste material will be kept in designated areas and not remain on site for a period longer than 90 days before it is disposed off. 	Contractors responsible for construction	During construction phase

8.2.1.6. Soil Pollution			
Activity	Mitigation Measures	Responsible	Time Frame
Mixing cement	Where cement and concrete, etc. is mixed on site, this shall be done in specified areas on concrete aprons or on protected plastic linings and provision shall be made to contain spillage or overflows onto soils.	Contractors responsible for construction	During construction phase

8.2.1.7. Soil and Groundwater Pollution			
Activity	Mitigation Measures	Responsible	Time Frame
Mixing of chemicals	<ul style="list-style-type: none"> The mixing of any solvents, asphalt, sealants, adhesives, paints, chemicals or other noxious materials shall only be undertaken in designated areas on concrete aprons that have spillage control channels and separate storage areas. The mixing of materials will not be permitted in the general areas of the site. All surplus or waste materials are to be removed from the site. All these operations shall only be allowed on site under strict observations of the manufacturers' instructions. 	Contractors responsible for construction	During construction phase

8.2.1.8. Stormwater and erosion control			
Activity	Mitigation Measures	Responsible	Time Frame
Stormwater and erosion control	<ul style="list-style-type: none"> Stormwater shall be diverted away from all construction or site areas in cut-off drains. Measures will be taken to reduce water velocity. Emphasis should be placed on the management of stormwater. Exposed soil should be re-vegetated or covered to prevent soil erosion. An efficient storm water drainage system should be designed within the site and along access roads and buildings. When soil is cleared of vegetation, management techniques to prevent water and wind erosion should be employed e.g. seeding of topsoil and subsoil and stockpiles, brush packing and contour channels/berms (to reduce water velocity and divert surface water runoff downslope). The area in general possesses a low to medium risk for erosion (especially if grass cover is removed for construction purposes). Congregation of storm water should be avoided. 	Contractors responsible for construction	During construction phase

8.2.1.9. Surface water contamination			
Activity	Mitigation Measures	Responsible	Time Frame
Ablution facilities	Adequate sanitary facilities and ablutions must be provided for construction workers to avoid them using the bush.	Contractors responsible for construction	During construction phase

8.2.1.10. Pollution of groundwater (subterranean aquifer)			
Activity	Mitigation Measures	Responsible	Time Frame
Storage of all materials, fuels and chemicals	<ul style="list-style-type: none"> Controlled use and or storage of all materials, fuels and chemicals which could potentially leach into underground water, should take place. If fuel is to be stored on site during construction, it shall be allocated to specific areas and safeguards shall be implemented to control and contain spillages for the complete extent of the time that the material is stored. The necessary firefighting equipment will also be maintained on site to deal with any fire incidents. All residue from spillages will be removed from the site by contractors. Site activities should be properly managed. Adequate sanitary facilities 	Contractors responsible for construction	During construction phase

	and ablutions must be provided for construction workers.		
--	----------------------------------------------------------	--	--

8.2.1.11. Noise			
Activity	Mitigation Measures	Responsible	Time Frame
Noisy activities	<ul style="list-style-type: none"> All equipment and vehicles on the site will be equipped with noise suppressing measures and kept in proper working order. Where working at the site noise levels must be within ambient noise level so as not to cause a nuisance to adjacent areas of residence. Contractors should control site activities - working hours to be controlled by site engineer. Residents of adjacent properties should be informed if any unusually noisy activities are planned. Noise impacts are reduced over distance at a rate of 1db (decibel) per 13 metres. Working hours should be limited to between 6h00 and 17h00 (Mondays to Saturdays only). 	Contractors responsible for construction and site engineer	During construction phase

8.2.1.12. Fires			
Activity	Mitigation Measures	Responsible	Time Frame
Fires	No fires will be permitted on site without the authority of the resident engineer or project manager.	Contractors responsible for construction and site engineer/manager	During construction phase

8.2.1.13. Cleanliness			
Activity	Mitigation Measures	Responsible	Time Frame
Maintenance of site	<ul style="list-style-type: none"> The site is to be maintained in a sanitary condition and all toilet facilities shall be maintained in good order. Food cooking will only be permitted in designated areas. 	Contractors responsible for construction	During construction phase

8.2.1.14. Air Pollution – dust and smoke			
Activity	Mitigation Measures	Responsible	Time Frame
Dust and smoke caused by construction activities	<ul style="list-style-type: none"> Damping down of access roads and cleared areas should take place. Control over cooking fires by site foremen/engineer. Topsoil should be seeded to prevent wind erosion. As much natural vegetation 	Contractors responsible for construction, site engineer/manager and ECO	During construction phase

	<p>should be retained as is possible.</p> <ul style="list-style-type: none"> Careful pre-planning of trees that are to be retained should be done. 		
--	-------------------------------------------------------------------------------------------------------------------------------------------------------------------	--	--

8.2.1.15. Visual impact of construction			
Activity	Mitigation Measures	Responsible	Time Frame
Visual impact of construction	<ul style="list-style-type: none"> Retain as many existing trees as possible to screen construction works and camps. Change of land use from natural (disturbed) veld to a construction site will occur. This must however be seen in the context of the advantages that the proposed development will have for the area. Construction activities should be kept clustered on site. 	Contractors responsible for construction	During construction phase

8.2.1.16. Rehabilitate compacted soils			
Activity	Mitigation Measures	Responsible	Time Frame
Rehabilitate compacted soils	<ul style="list-style-type: none"> Soils compacted by construction activity shall be deep ripped to loosen compacted layers and graded evenly. Topsoil shall be re-spread upon completion of construction activities. 	Contractors responsible for construction	During and after construction phase

Draft – Environmental Management Programme

8.2.2 Impacts on the biological environment

8.2.2.1. Terrestrial ecology - vegetation			
Activity	Mitigation Measures	Responsible	Time Frame
Construction activities	<ul style="list-style-type: none"> • Unnecessary removing of vegetation from areas which will not be utilised, should be avoided. • Pre-planning of trees that are to be removed, should be done. Existing indigenous trees should be retained where possible. • Excessive loss of vegetation (especially grass cover), should be avoided. Vehicular access should be restricted to essential areas only. • Trees should only be removed where these interfere directly with construction. • Contractors should implement rehabilitation works after completion of construction. • Compacted soils should be deep-ripped after the construction process in order to facilitate the re-establishment of vegetation. • Colonization of disturbed soil by weeds, need to be controlled. • Areas which have been traversed by heavy vehicles (compacted) should be 	Contractors responsible for construction	During and after construction phase

	deep-ripped (500mm), after maintenance, upgrading and/or construction activities.		
--	-----------------------------------------------------------------------------------	--	--

8.2.2.2. Terrestrial ecology - fauna			
Activity	Mitigation Measures	Responsible	Time Frame
Construction activities	<ul style="list-style-type: none"> Disturbance and snaring of animals during construction should be prohibited. Any fauna disturbed as a result of construction, must be noted, so that translocation can take place if necessary. Capture or snaring of birds or other fauna must be strictly prohibited on site - especially w.r.t. contractors employees. 	Contractors responsible for construction	During construction phase

8.2.3 Impacts on the social and economic environment

8.2.3.1. Safety			
Activity	Mitigation Measures	Responsible	Time Frame
Safety procedures during construction activities	<ul style="list-style-type: none"> Implementation of an Occupational Health and Safety management system should be required of contractors. Safety measures and work procedures to be communicated to construction workers. 	Contractors responsible for construction and Safety officer	During construction phase

Draft – Environmental Management Programme

	<ul style="list-style-type: none"> • First aid facilities to be on hand at all times. • Medical screening of employees should take place. • Contractors shall implement adequate and mandatory safety precautions relating to all aspects of the operation. Warning and advisory signage should also be implemented (also with regards to vehicular movement along public roads). 		
--	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--	--

8.2.3.2. Clean construction camp			
Activity	Mitigation Measures	Responsible	Time Frame
Construction camp	<ul style="list-style-type: none"> • The construction camp should be kept in a neat and tidy condition. • All litter and arisings from the construction camp shall be collected and removed on a continuous basis to avoid a built up. 	Contractors responsible for construction	During construction phase

8.2.3.3. Cultural and/or archaeological environment			
Activity	Mitigation Measures	Responsible	Time Frame
Discovery of Cultural and/or archaeological sites	<p>Due to the subsurface nature of archaeological remains and the fact that graves can occur anywhere on the landscape, it is recommended that the following chance find procedure is implemented:</p> <ul style="list-style-type: none"> • If during the pre-construction phase, construction, operations or closure phases of this project, any person employed by the developer, one of its subsidiaries, contractors and subcontractors, or service provider, finds any artefact of cultural significance or heritage site, this person must cease work at the site of the find and report this find to their immediate supervisor, and through their supervisor to the senior on-site manager. • It is the responsibility of the senior on-site Manager to make an initial assessment of the extent of the find, and confirm the extent of the work stoppage in that area. • The senior on-site Manager will inform the ECO of the chance find and its immediate impact on operations. The ECO will then contact a professional 	Developer's permanent employees, its subsidiaries, contractors, subcontractors and ECO	During pre-construction, construction, operations or closure phases

	archaeologist for an assessment of the finds who will notify the SAHRA.		
--	-------------------------------------------------------------------------	--	--

8.2.3.4. Optimisation of the local economy			
Activity	Mitigation Measures	Responsible	Time Frame
Labour used during construction	<ul style="list-style-type: none"> • Where appropriate, use should be made of labour intensive construction methods • Local emerging contractors should be used. Advertisement of opportunities for local emerging contractors should be done, before the project commences. • Optimal benefit can be derived in the local economy by the preferential employment of local tradesmen and sub-contractors. Where opportunities arise, local sub-contractors should be set up and assisted by sub-contractors from outside the area, to create a more permanent skills and entrepreneurial base. • Sourcing of raw materials and construction materials should take place in the local and sub-regional economy. 	Proponent and contractor	During pre-construction & construction phases

8.2.3.5. Unsocial activities on site			
Activity	Mitigation Measures	Responsible	Time Frame
Behavior of labour	<ul style="list-style-type: none"> Appointed contractors should be required to implement security measures at construction camps/material laydown areas. Security gate control measures should be implemented in order that only labourers and authorised persons obtain access to the construction camps/material laydown areas. Prostitution, drinking, crime, vandalism etc. generally only arise where labourers are away from home. If the majority of the labour force is recruited locally, incidence of prostitution and other un-social activities could be reduced. Transportation of labour to and from the site, should take place in an orderly manner to discourage loitering on adjacent areas and possible increase in crime. 	Contractors responsible for construction	During construction phases

8.3 Operational phase mitigation guidelines

The following section will address a range of mitigation actions that will manage the predicted impacts associated with the operation of the different components of the development.

8.3.1. The bio-physical environment			
Activity	Mitigation Measures	Responsible	Time Frame
Erosion control	<ul style="list-style-type: none"> Seeding of topsoil to prevent wind and water erosion should take place. Management techniques should be employed to prevent erosion e.g. seeding topsoil and subsoil and stockpiles, brush packing and contour channels/berms etc. When soil is cleared of vegetation, management techniques to prevent water erosion should be employed (e.g. reduction of water velocity and the diversion of surface water runoff downslope). 	Contractors responsible for construction of houses	During operational phase

8.3.2. Solid waste disposal			
Activity	Mitigation Measures	Responsible	Time Frame
Solid waste disposal	<ul style="list-style-type: none"> • Solid waste should be dumped at a registered dumping site. Disposal of waste is regulated by the by-laws of the local authority. It will be the responsibility of the Lephalale Municipality to remove solid waste from the houses to the municipal dumping site. • Burning of any waste (including garden waste) inside the development shall be prohibited. 	Lephalale Municipality	During operational phase

8.3.3. Water usage			
Activity	Mitigation Measures	Responsible	Time Frame
Water usage	It is proposed for that the highest level of service be provided with house connections. All stands will be connected to a comprehensive piped water network to be installed in the street reserves.	To be installed by developer and maintained by Lephalale Municipality	During operational phase

8.3.4. Effluent			
Activity	Mitigation Measures	Responsible	Time Frame
Effluent	A proposed bulk sewer pipeline which is approximately 4.6km long will be constructed to the Zongesien WWTP. All stands in the proposed development will be connected to a gravitational pipe network draining into the proposed bulk sewer pipeline.	To be installed by developer and maintained by Lephalale Municipality	During operational phase

8.3.5. Alien species control			
Activity	Mitigation Measures	Responsible	Time Frame
Maintenance of construction areas	<ul style="list-style-type: none"> • Areas where construction has taken place, should to be kept free of invaders/weeds. • Regulation 15 of the Act on the Conservation of Agricultural Resources (as amended), Act No. 43 of 1983, determines that the establishment of declared weeds and invasive plants during and after development should be prohibited. 	Proponent contractor and later maintained by Lephalale Municipality	During operational phase

	<ul style="list-style-type: none"> • It is recommended that alien species be removed and destroyed, preferably burned, before commencement of any construction activities. 		
--	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--	--

8.3.6. Induced traffic			
Activity	Mitigation Measures	Responsible	Time Frame
Induced traffic from proposed development	<ul style="list-style-type: none"> • Implement recommendations as proposed by the traffic engineer/Lephalale Municipality's traffic department. • Entrances to the site should be designed according to civil engineering specifications and be approved by the local municipality. • Introduce measures to lower the speeds of vehicles driving along access roads that lead to the site and to other adjacent residential areas. 	Proponent contractor and later maintained by Lephalale Municipality	During operational phase

8.3.7. Lighting			
Activity	Mitigation Measures	Responsible	Time Frame
Street Lights	The potential impact of street lighting upon houses in adjacent areas, should be minimised by directing lighting downwards and away from adjacent houses.	Proponent contractor and later maintained by Lephalale Municipality	During operational phase

8.4. Decommissioning Phase

Should the site for any reason be closed, an Environmental Management Programme shall be submitted to DEDET for approval.

9. MONITORING & REPORTING

For the purposes of this document environmental monitoring is defined as “the repetitive and continued observation, measurement and evaluation of environmental data to follow changes over a period of time to assess the efficiency of control measures”.

Monitoring has a smaller scope, usually at a project or programme level. Monitoring is undertaken on an ongoing basis for the duration of the project, programme or activity – usually before, during, and after implementation of each project or programme.

9.1. Compliance Monitoring (Regulatory Permit Monitoring)

Environmental protection and management can be ensured through the monitoring of compliance by a regulating organisation such as Department of Environmental Affairs. Compliance with environmental laws, regulations, permits, licenses etc., is controlled through effective monitoring and compliance assessment. Such compliance must be monitored to ensure that control mechanisms have the desired effect.

Compliance monitoring aims to:

- Determine compliance with applicable laws, regulations, permit conditions, orders and settlement agreements;
- Review and evaluate the activities of the regulated body; and
- Determine whether or not conditions presenting imminent and substantial endangerment may exist.

Compliance monitoring consists of a wide range of activities in six basic categories which may overlap:

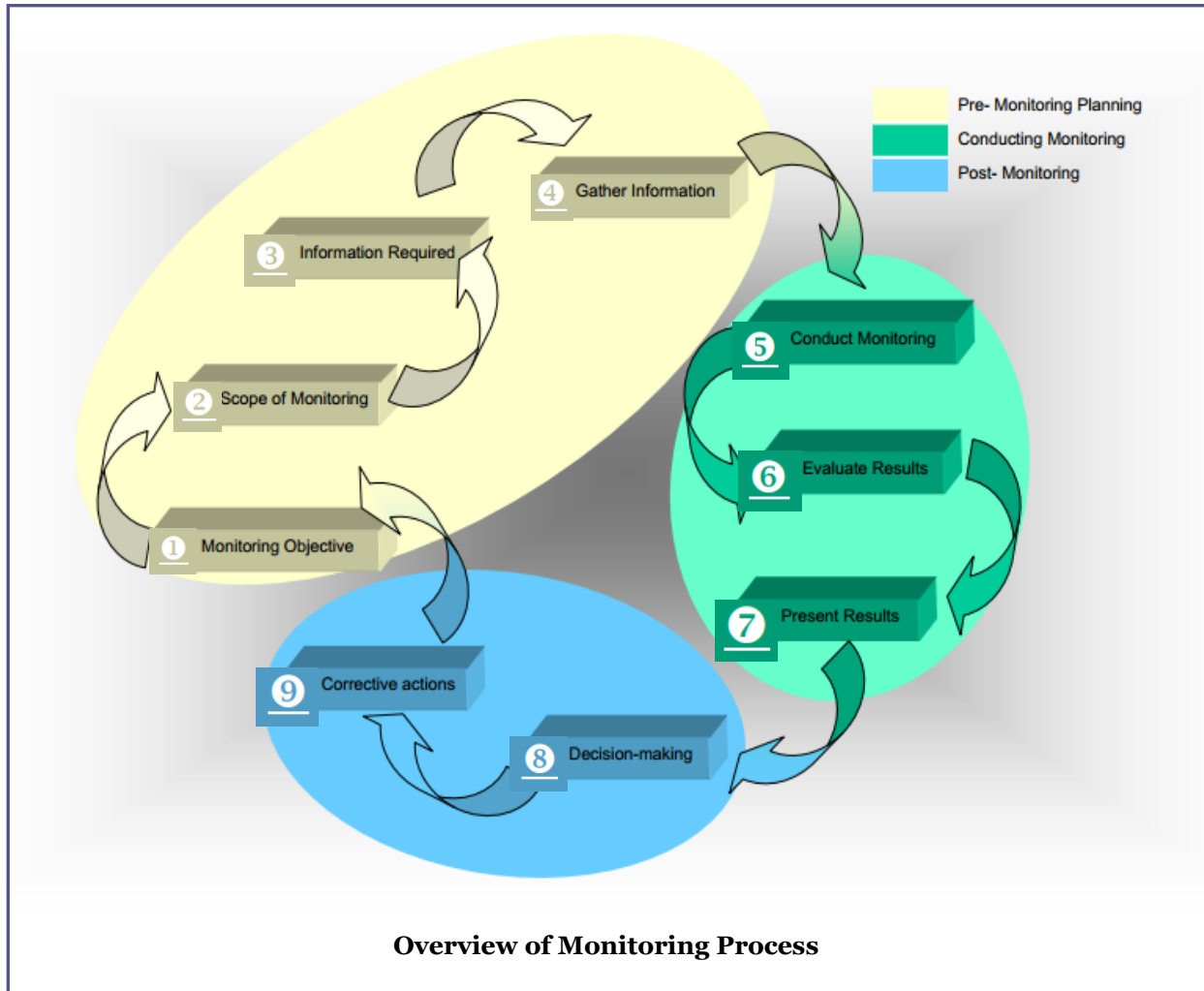
1. Surveillance - a pre-inspection activity to obtain general site information prior to entering the site;
2. On-site inspections may include record reviews, observations, sampling, interviews, etc., and may have different foci.
3. Investigations are more detailed inspections and may be needed if an inspection or record review suggests the potential for serious, widespread, and/or continuing violations.
4. Record reviews may be conducted at the regulator’s offices, or at the site, and may or may not be combined with fieldwork.
5. Records may be derived from routine self-monitoring requirements, inspection reports or remote sensing.

6. Targeted information gathering may be used to provide or acquire more accurate information on the status of compliance and/or environmental conditions.

9.2. Generic Monitoring Process

The purpose of monitoring is to follow changes over a period of time and to assess the efficiency of control measures, through a process of repetitive and continued observation, measurement and evaluation of environmental data. Checklists are the most widely used monitoring tools however other monitoring tools include electronic decision support instruments, online digital monitoring instruments and before and after pictures.

The monitoring process is designed such that the process is applicable at a strategic, programme or project level. Specific indicators need to be monitored regularly to ensure that projects/programmes, are socially, environmentally and ecologically sustainable. Further, the monitoring process is applicable to all types of monitoring.



(Department of Water Affairs, 2005)

Step 1

Monitoring objectives need to be determined, bearing in mind the environmental goals and objectives of the EMPR and the Environmental Authorisation (EA once issued). Legislation, regulations and best practices should also be borne in mind when determining objectives. Examples of monitoring objectives could include:

- ensuring legal compliance for instance monitoring to ensure that permit conditions are met or compliance to the EMP, EIA, etc.(compliance monitoring);
- monitoring of pre-determined indicators e.g. ensuring that the water in a river downstream of a dam is of the correct quality and quality; (baseline monitoring)
- ensuring that environmental programmes are effective and used correctly for their intended purpose (programme evaluation monitoring);

Draft – Environmental Management Programme

- reduce environmental liability on an environmentally sensitive project (e.g. monitoring of suitable indicators may allay the public's concerns, cumulative impact monitoring);
- Periodic inspection of a project to ensure compliance with the EMP, rehabilitation specifications and best practices (inspection monitoring)
- or a combination of the above.

Once the objective has been determined, appropriate checklists and other tools can be used.

Step 2

Before monitoring can begin, the scope must be clearly defined, based on the objectives. Usually only one project or programme is monitored at a time.

Step 3

The general information that will be required includes the details of the actual project. The following information may be needed:

- what is the purpose of the project?
- what type of project is it?
- copy of the EA, EMP, EIA report, etc.
- what activities are involved, etc.

If indicators are being monitored, background information is also required regarding the indicators to be monitored and tools that will be used during the project. Information on the targets and timeframes associated with each indicator is required.

Step 4

Depending on the objective of the monitoring, a variety of tools can be used to assist in monitoring. Checklists are often used to gather information during monitoring. The checklists could be used for monitoring however one would need to adapt the checklists for specific types of monitoring. Additional checklists may need to be designed for the different types of monitoring.

Suitable monitoring points for each indicator should be identified at the project site or in nearby areas as required. Suitable intervals for monitoring each indicator should be determined. The project team should be made aware of what types of monitoring will be carried out during the project, and when and where the monitoring would occur in order to monitor the correct information.

Monitoring must be conducted by a suitably qualified person.

Step 5

The checklists will be based on the requirements of the EA and EMPR approved during the EIA process. Checklists may also be based on relevant laws and regulations. Monitoring of indicators can be carried out through making observations and taking samples at the monitoring points, at the predetermined intervals. The information will be gathered using the checklist mentioned above as well as any other suitable tools (e.g. bio-monitoring lists, on-line digital data, etc).

Step 6

The results of the monitoring are evaluated by comparing the information gathered with the targets that were originally identified. Evaluating monitoring results would involve a similar process to that for auditing, with the exception that certain specific monitoring tools will have their own methods of evaluation. The evaluation/interpretation of the monitoring data is considered the most crucial step of the monitoring process. Decisions on instituting corrective actions are based on the interpretation of the monitoring data.

Step 7

Monitoring results can be presented as a completed checklist, however it is advisable that trends analyses are compiled. Trend reports are an interpretation of the results of the monitoring reports, and are presented in the form of easily understood graphics.

Unlike audit results, it is not likely that monitoring results will be included in annual reports, though they will probably form part of project reports. The monitoring results must be stored in a suitable information system as they will be required for auditing purposes.

Step 8

The decision-making process will be less strategic and more focused on correcting environmental performance problems. In monitoring, the decision making process is driven by the need to resolve the non-compliance immediately.

Step 9

Instituting corrective action in the monitoring process is more immediate than the auditing process. All non-compliance issues will need to be corrected immediately in other words it may not be possible from a timing perspective to implement policy changes in order to improve monitoring results. The corrective action will be specific to

each project and may need the input from all parties working on the project such as the planners, engineers, contractors, IAPs, etc.

9.3. Writing a Monitoring Report

The checklists and monitoring reports for environmental monitoring should be kept by the environmental manager and should be stored in a suitable information system. The checklists and reports must be available for use when conducting an audit of projects, programmes, policies etc. It is the responsibility of the person conducting the monitoring to ensure that the environmental monitoring report or checklist is accurately completed, the observations made during the monitoring are correct and a true reflection of the actual situation and that the interpretation of the data is logical and factual. The party responsible for performing the environmental must sign the monitoring report.

A monitoring report will not be a detailed report, as much of the monitoring information will be contained in the completed checklists. The monitoring report must begin with basic administrative information related to the monitoring. This includes the date/s that the monitoring was conducted, the type and objective of the monitoring, how the information on the checklist was obtained, who performed the monitoring, which checklists were used and any problems encountered during the monitoring process.

The monitoring report should then have a summary that identifies the key findings and recommendations of the monitoring, including a summary of compliance and non-compliance. A more detailed description of the important monitoring results should then be compiled. The report should also include a physical description of the site, the indicators (if relevant) and monitoring sites. The type of information that will be included in the report is dependent on the type of monitoring that was required for the specific purpose.

The report must clearly suggest recommendations or corrective actions that will assist in attaining compliance. Corrective actions will vary widely and should be decided upon by the person with the delegated powers to institute change.

It is crucial that the monitoring report includes all relevant supporting information, the checklists in particular must be completed in full. Diagrams, photographs, and other data may also form part of the report.

Recommendations to address areas of non-compliance or opportunities to reduce the risk of harm or detriment to the environment resulting from the activity, may also be included. The recommendations should be prioritized and dates for instituting corrective actions should be included where necessary.

9.4. Instituting Corrective Action, Continual Improvement and Preventative Measures

Corrective action for monitoring usually involves simple measures designed to stop the immediate problem for the short-term. Identifying the simple cause of a monitoring finding is fairly straightforward. The checklists should allow the monitor to highlight the areas where environmental problems have arisen. An examination of the facts should then enable the monitor to understand the problem and identify the cause. Corrective actions need to be devised which are specific to each problem. The assistance of a higher-level decision-maker may be useful in establishing appropriate corrective actions. A suitable deadline for the implementation of a corrective action should be determined. Further monitoring of this corrective action must be included in all future monitoring programmes.

The proponent and/or its appointed project engineer shall appoint an Environmental Control Officer (ECO) to monitor compliance with the EMPR (above) - especially the following shall be monitored:

- Limiting of disturbance caused by construction activities (geographical area),
- Effective waste management,
- Minimisation of disturbance of biota,
- Legal compliance (including the stipulations of the Environmental Authorisation (Record of Decision)).

The ECO shall conduct inspections of the construction site on a monthly basis.

The ECO shall document the findings of his monitoring actions in a Monitoring Report which shall be submitted to DEDET (Compliance section).

The proponent contractor shall keep a DOCUMENTED COMPLAINTS REGISTER. For the purposes of receiving complaints, the contact details of the proponent and appointed contractor shall be clearly displayed at the main entrance to the site. The nature of complaints that are received shall be brought to the attention of LEDET and the contractor(s). The proponent contractor shall give a suitable written response to complainants where required.

See enclosed pro-forma "COMPLAINTS REGISTER" – under Appendices (section 11 of this document).

The proponent contractor shall document "environmental incidents" on an "ENVIRONMENTAL INCIDENT REPORT SHEET" (EIRS) within 1 day (24 hours) from the time that the incident has occurred.

See enclosed pro-forma "ENVIRONMENTAL INCIDENT REPORT SHEET" (EIRS) – under Appendices (section 11 of this document).

Draft – Environmental Management Programme

In an instance where an "environmental incident" is recorded, the proponent shall take appropriate action to correct the "environmental incident". Such action shall be in accordance with the nature and scale of the recorded incident. Such corrective action shall be implemented as soon as possible after the occurrence of the incident.

"Corrective action" undertaken by the proponent shall also include the rehabilitation of secondary environmental disturbance/damage resulting from undertaking corrective action. The re-occurrence of an environmental incident shall be avoided through the implementing of suitable precautionary measures to prevent the recurrence of such.

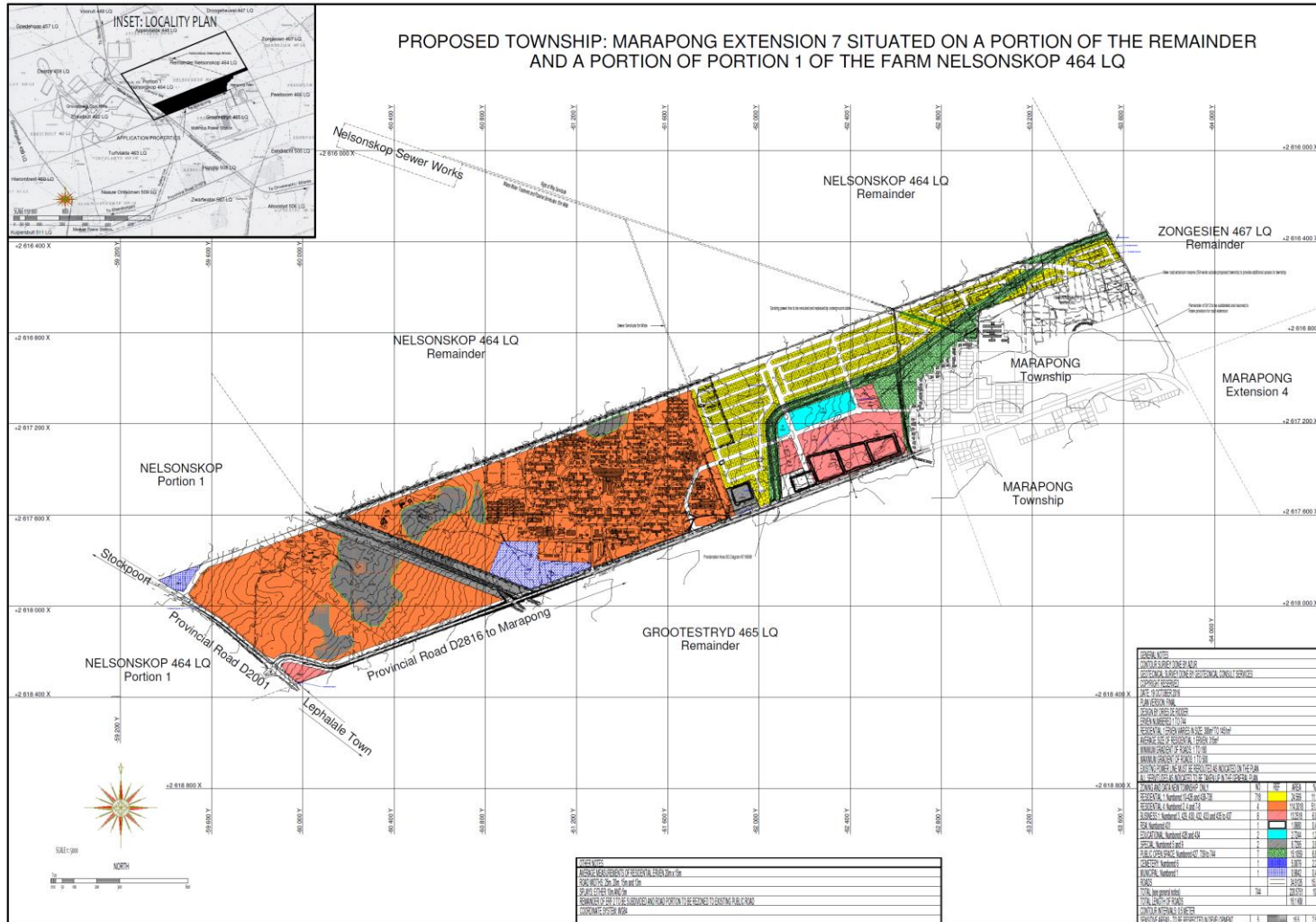
Contractors shall report environmental incidents to the proponent/ECO during with 24 hours of occurrence. A course of action shall then be decided upon jointly (as a precautionary measure to avoid the re-occurrence of these types of incidents).

10. CONCLUDING REMARKS

This document should be viewed as a dynamic document and additions should be made to it as other impacts/issues are identified during the course of the project. Where additions or alterations are made, the parties responsible for construction, maintenance etc. should be informed of this in writing – such parties should acknowledge receipt of such additions/amendments in writing.

In conclusion it can be stated that several negative and positive impacts/effects can potentially arise from the proposed development. These can however be mitigated through the implementation of a number of mitigation measures (as contained in this Environmental Management Programme).

11. MAP



Draft – Environmental Management Programme

12. APPENDICES

ENVIRONMENTAL INCIDENT REPORT SHEET	
NAME OF PROJECT:	
DATE AND TIME OF RECORDING:	
INCIDENT DESCRIPTION: (attach additional documentation e.g. photos or sketches where necessary)	
Incident number:	Date of incident:
	Time of incident:
1. Location of incident	
2. Volume of material involved (e.g. litres or m ³) or number of features damaged	
3. Cause(s) of incident	
DESCRIPTION OF CORRECTIVE & PREVENTIVE ACTIONS TAKEN:	
4. Materials and methods used for mitigation of the incident during and immediately after its Occurrence	
5. Disposal methods followed with Contaminated material (where Relevant)	
6. Steps taken to prevent a re-Occurrence of the incident	
7. Additional actions required by Environmental officer	
Signature of contractor's Representative:	I hereby certify that the above is a true and accurate account of the incident and the corrective and preventive actions taken _____ Signed Date
Signature of environmental officer:	I hereby certify that the above is a true and accurate account of the incident and the corrective and preventive actions taken _____ Signed Date

COMPLAINTS REGISTER	
NAME OF PROJECT:	
DATE AND TIME OF RECORDING:	
DESCRIPTION OF COMPLAINT RECEIVED: (attach additional information where necessary)	
Complaint number:	Date of complaint: Time of complaint:
Complaint received from:	Name: Address: Tel no.:
Cause(s) of complaint	
DESCRIPTION OF CORRECTIVE & PREVENTIVE ACTIONS TAKEN:	
Materials and methods used for mitigation to prevent a re-occurrence	
Signature of contractor's representative:	I hereby certify that the above is a true and accurate account of the complaint that was received and the corrective and preventive actions taken _____ Signed Date
Signature of environmental officer:	I hereby certify that the above is a true and accurate account of the complaint that was received and the corrective and preventive actions taken _____ Signed Date

<u>REGISTER OF RESPONSE TO COMPLAINT(S)</u>	
NAME OF PROJECT:	
DATE AND TIME OF RECORDING:	
DESCRIPTION OF COMPLAINT RECEIVED: (attach additional information where necessary)	
.....	
.....	
.....	
Complaint number:	Complaint received from:
	Name:
	Address:
	Tel no.:
DESCRIPTION OF RESPONSE PROVIDED TO THE COMPLAINANT (INCLUDING CORRECTIVE AND PREVENTIVE ACTION TAKEN):	
.....	
.....	
.....	
Signature of contractor's representative:	I hereby certify that the above is a true and accurate account of the complaint that was received and the response given
	Signed: Date:
Signature of environmental officer:	I hereby certify that the above is a true and accurate account of the complaint that was received and the response given
	Signed: Date:

13. REFERENCES

Department of Water Affairs and Forestry, 2005 Environmental Monitoring and Auditing Protocol. Integrated Environmental Management Sub-Series No.1.7 . Second Edition. Pretoria.

Department of Water Affairs and Forestry, February 2005 Environmental Monitoring and Auditing Guideline. Integrated Environmental Management Sub-Series No. IEMS 1.7. Third Edition. Pretoria. Appendix J: Environmental Best Practice Monitoring Report: Construction