AT DARLING GREEN ESTATE ON FARM 4401, DARLING, MALMESBURY DISTRICT

DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME

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COMMITMENT AND DECLARATION OF UNDERSTANDING BY CONTRACTOR AND DEVELOPER FOR THE PROPOSED AT DARLING GREEN ESTATE ON FARM 4401, DARLING

I, the undersigned ……., as duly authorized by the Contractor, have studied and understand the contents of this document. On behalf of the Contractor, I confirm that the Contractor undertakes to adhere to the conditions as set out herein, unless specifically otherwise agreed to in writing.

Signed at ……. on this …….. Day of ……20……

…….
For Contractor

I, the undersigned ……, as duly authorized by the Developer have studied and approve the contents of this document on behalf of the Developer, for implementation by all Contractors involved at the site.

Signed at ……. on this …….. day of ……20…….

…….
Developer's Representative

DEFINITIONS

Auditing:	A systematic and objective assessment of an organization's activities and services conducted and documented on a periodic basis based to a (e.g. ISO 19011:2013) standard.
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.
Contractor:	An employer, as defined in section 1 of the Occupational Health and Safety Act 85 of 1993, who performs construction work and includes principal contractors
Environment:	A place where living, non-living and man-made features interact, and where life and diversity is sustained over time.
Evaporation:	The change by which any substance (e.g. water) is converted from a liquid state into and carried off as vapour.
Developer:	One who builds on land or alters the use of an existing building for some new purpose
Independent:	Is independent and has no interest in any business related to the development site, nor will receive any payment or benefit other than fair remuneration for the task undertaken
Groundwater:	Subsurface water in the zone in which permeable rocks, and often the overlaying soil, are saturated under pressure equal to or greater than atmospheric.
Landowner:	Holder of the estate in land with considerable rights of ownership or, simply put, an owner of land
Monitoring:	A systematic and objective observation of an organisation's activities and services conducted and reported on regularly.
Natural vegetation:	All existing vegetation species, indigenous or otherwise, of trees, shrubs, groundcover, grasses and all other plants found growing on a site.
Pollution:	The result of the release into air, water or soil from any process or of any substance, which is capable of causing harm to man or other living organisms supported by the environment.
Protected Plants:	Plant species officially listed under the Threatened or Protected Species regulations as well as on the Protected Plants List (each province has such a list), and which may not be removed or transported without a permit to do so from the relevant provincial authority.
Red Data Species:	Plant and animal species officially listed in the Red Data Lists as being rare, endangered or threatened.

Rehabilitation:	Making the land useful again after a disturbance. It involves the recovery of ecosystem functions and processes in a degraded habitat. Rehabilitation does not necessarily re-establish the pre-disturbance condition, but does involve establishing geological and hydro logically stable landscapes that support the natural ecosystem mosaic.
Site:	Property or area where the proposed development will take place

ACRONYMS

DEA&DP:	Department of Environmental Affairs and Development Planning
DWS:	Department of Water and Sanitation
ECO:	Environmental Control Officer
EA:	Environmental Authorisation
EIA:	Environmental Impact Assessment
EM:	Environmental Manager
EMP:	Environmental Management Programme
EO:	Environmental Officer
ER:	Engineer's Representative
I&AP:	Interested and Affected Party
IEM:	Integrated Environmental Management
PM:	Project Manager
SANS:	South African National Standards

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DEVELOPER'S COMMITMENT

The developer has committed itself to a set of values that include the maintenance of good relations and transparent communications with all stakeholders, and the dynamic engagement of the larger community.

The developer undertakes to implement suitable management systems for all the areas and aspects of this operation. This will ensure that development itself and management of the project will comply with legal, technical, environmental and transformation policies and standards.

The developer, in drafting this EMP for implementation, intends to enable continuous improvement in legal compliance and the sustainable operation of the site.

The EMP intends to change the way in which the owners and the contractor plan for and manage resources to achieve sustainability.

The satisfactory implementation of the EMP on site will require both the full support and commitment of all personnel.

CHAPTER 1

1.1. Executive Summary

This EMP has been prepared principally in compliance with the requirements of Section 24N and Section 34 of the National Environmental Management Act 107 of 1998. This document, together with the conditions in the Environmental Authorisation, must be adhered to.

The EMP must be included as part of all contract documentation for all contractors in the construction phase of the development.

The Author and Eco Impact Legal Consulting (Pty) Ltd ("Eco Impact")

Nicolaas Hanekom is a registered Professional Natural Scientist in the ecological science field with the South African Council for Natural Scientific Professions ("SACNASP") and a qualified EAP who holds a Masters Technologiae, Nature Conservation ("Vegetation Ecology and Biodiversity Assessment") degree from the Cape Peninsula University of Technology.

He further qualified in Environmental Management Systems ISO 14001:2004, at the Centre for Environmental Management, North-West University, as well as Environmental Management Systems ISO 14001:2004 Audit: Internal Auditors Course to ISO 19011:2003 level, from the Centre for Environmental Management, North-West University qualifying him to audit to ISO/SANS environmental compliance and EMS standards.

Mr Hanekom has been responsible for many environmental impact assessments and several EIA, waste license and atmospheric emission license applications as well as being involved in the implementation of several environmental management systems.

1.2. Project Description

This section of the report is included in compliance with Section 24N (2) (e) of the National Environmental Management Act, 107 of 1998.

The proposed development is situated on the eastern edge of Darling alongside the approach road from Malmesbury/Atlantis (north side). The construction of a Green Estate that will consists of:

- 9 (1 ha stand) = 9ha
- 20 (0.5 ha stand) = 10ha
- 30 (0.25 ha stand) = 7.5ha
- 30 (0.125 ha stand) = 3.75ha
- Crafters village (100-130 units)
- Food and craft market,
- Open space erf, and roads and services with a total development footprint of 66ha.

The Apolisvlei wetland was found to be in a largely natural state B, that is largely natural with few modifications but with some loss of natural habitats, while the seepage area in the north-east corner of the property is moderately modified. The main impact on the both wetland areas on the property resulted, directly and indirectly, from the past land uses on this property as it was previously ploughed and farmed. The current land use of livestock grazing further impacts factors such as terrestrial encroachment, invasive plant encroachment and indigenous plant removal. Terrestrial encroachment of the outer edges of the wetlands as well as invasion by invasive plants were also found impacting from the surrounding area which results in some drying out of areas in the wetlands and vegetation transformation.

CHAPTER 2

This section of the report is included in compliance with Section 24N (2) (e) of the National Environmental Management Act 107 of 1998.

It deals with issues relating to the implementation of the EMP.

2.1 Organizational Structure

The organizational structure identifies and defines the responsibilities and authority of the various persons and organizations involved in the project. All instructions and official communications regarding environmental matters must follow the organizational structure.

The Environmental Official (EO), to whom the Engineer's Representative (ER) and/or Environmental Control Officer (ECO) must report and interact, must be the responsible client representative.

The EMP must be an agenda item at the monthly site and operations meetings and the responsible client representative(s) may attend these meetings in order to provide input with respect to compliance with the EMP.

2.2 Responsibilities and Functions of the Environmental Control Officer

The ECO will be responsible for monitoring, reviewing and verifying compliance with the EMP and/or EA by all contractors and site management during site visits.

The ECO duties in this regard will include the following:

With the assistance, where necessary of the ER, to ensure all necessary environmental authorizations and permits have been obtained and are available and visible on site at the ER offices.

- monitor and verify that the EMP and/or EA is adhered to at all times and by taking action if the specifications are not followed;
- monitor and verify that environmental impacts are kept to a minimum;
- review and approve construction method statements, with input as appropriate from the ER;
- assist the contractor in finding environmentally responsible solutions to problems;
- report on the environmental issues at the site meetings and other meetings that may be called regarding environmental matters, if requested by ER;
- inspect the site and surrounding areas regularly with regard to compliance with the EMP and/or EA;
- monitor the environmental awareness training for all personnel coming onto site;
- advise management on the removal of person(s) and/or equipment not complying with the specifications, after collaboration with the ER. Recommendations must be recorded by the ER in a Site Instruction Book;
- ensure that activities on site comply with known legislation of relevance to the environment;
- recommend the issuing of penalties via the developer for contraventions of the EMP and/or EA;
- keep a photographic record of progress on site from an environmental perspective; and
- undertake a continual internal review of the EMP and/or EA and submit a report to the developer and the responsible DEA&DP Environmental Official according to EA conditions.

2.3 Agreed Work Plan and Site Visit Schedule of ECO

After initial construction start-up site visit it is recommended that an ECO site visit be conducted once a month during construction.

Information recording activity on site, and any guidelines or instructions emanating from there will be routinely made available electronically to the developer and applicable contractors and a copy of the report must be available at the site office.

Clearly matters of urgency or immediate action may be channelled appropriately on an urgent basis.

2.4 Site Manager

The site manager will have the following environmental control responsibilities:

- In conjunction with the ECO will present the environmental education programs to all persons employed on site.
- Consult with the ECO, landowner, developer and any contractor to resolve all environmental issues.
- Issue any instructions from the ECO to the management team via a formal site instruction book or appropriate management tool used for the purpose.
- Take responsibility for the penalty system. The ECO and developer recommendations must be considered when deciding whether or not to impose a penalty.
- The engineer will, via the ECO actions, be accountable for the overall implementation of the Environmental Management Programme.
- Keep a site diary and complaints register.

2.5 Contractors

As part of any tender, the tendering contractor must submit a first draft of a contractor's programme, to the developer which must include the environmental considerations to be followed prior to appointment.

The appointed Contractor's representative will have the following responsibilities:

- Ensure that all staff is familiar with the Environmental Management Programme, which explains the environmental policy for the project.
- Allow for sufficient time between surveying the exact locations where services will be intended and actual construction, for the ECO to facilitate and instruct for the removal of plants, seeds and cuttings if necessary.
- The contractor must keep his personnel fully aware of environmental issues and ensure they show adequate consideration to all environmental aspects.
- Establish environmental signs to be erected on the construction site at locations identified by the ECO and approved by the engineer.
- Be responsible for the cost of the restoration of any damage caused, in environmentally sensitive areas, as a result of contractor responsibility regarding negligence. This must be done in accordance with the engineer / ECO's specifications.
- Take responsibility and active steps to avoid any increase in the fire hazard.
- The contractor must take responsibility for implementing all the relevant provisions of the EMP, or if he encounters difficulties with the specifications, he must discuss alternative approaches with the ECO and engineer prior to proceeding.

Failure to comply with the EMP may result in the application of fines as set out, and any reported non-compliance may result in the suspension of work or termination of a contract.

2.6 Record keeping of activities, inclusive of recording of non-compliances and corrective actions

The site must keep a record of all activities relating to environmental matters on site, including:

- meetings attended;
- method statements received and approved;
- issues arising on site;
- cases of non-compliance with the EMP;
- corrective actions taken and penalties issued.

This information will be recorded in an appropriate manner in a site diary, registers, issues/warning book, etc.

2.7 Compliance with other legislation

It is important that all on site staff are aware of other relevant legislation that may relate to the activities taking place on site, especially local authority required compliances.

CHAPTER 3

Applicable Legislation, Policy and Environmental Principles

3.1 Applicable Legislation Identified

1. ADVERTISING ON ROADS AND RIBBON DEVELOPMENT ACT, 21 OF 1940
2. BASIC CONDITIONS OF EMPLOYMENT ACT, 75 OF 1997
3. COMPENSATION FOR OCCUPATIONAL INJURIES AND DISEASES ACT, 130 OF 1993
4. CONSERVATION OF AGRICULTURAL RESOURCES ACT, 43 OF 1983

5. CONSTITUTION OF THE REPUBLIC OF SOUTH AFRICA, 1996
6. ENVIRONMENT CONSERVATION ACT, 73 OF 1989, WESTERN CAPE NOISE CONTROL REGULATIONS
7. EMPLOYMENT EQUITY ACT, 55 OF 1998
8. ENVIRONMENT CONSERVATION ACT, 73 OF 1989
9. FENCING ACT, 31 OF 1963
10. HAZARDOUS SUBSTANCES ACT, 15 OF 1973
11. LABOUR RELATIONS ACT, 66 OF 1995
12. NATIONAL HEALTH ACT 61 OF 2003
13. NATIONAL HEALTH ACT 61 OF 2003 REGULATIONS RELATING TO THE MANAGEMENT OF HUMAN REMAINS
14. NATIONAL BUILDING REGULATIONS AND BUILDING STANDARDS ACT, 103 OF 1977
15. NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 107 OF 1998
16. NATIONAL ENVIRONMENTAL MANAGEMENT: AIR QUALITY ACT, 39 OF 2004
17. NATIONAL ENVIRONMENTAL MANAGEMENT: BIODIVERSITY ACT, 10 OF 2004
18. NATIONAL ENVIRONMENTAL MANAGEMENT: WASTE ACT, 59 OF 2008
19. NATIONAL FORESTS ACT, 84 OF 1998
20. NATIONAL HERITAGE RESOURCES ACT, 25 OF 1999
21. NATIONAL VELD AND FOREST FIRE ACT, 101 OF 1998
22. NATIONAL WATER ACT, 36 OF 1998
23. OCCUPATIONAL HEALTH AND SAFETY ACT, 85 OF 1993
24. TOBACCO PRODUCTS CONTROL ACT, 83 OF 1993
25. WATER SERVICES ACT, 108 OF 1997

CHAPTER 4

This section of the report is included in compliance with Section 24N (2) (e) of the National Environmental Management Act, 107 of 1998.

Compliance

4.1 Monitoring and Auditing

4.1.1 Introduction

In keeping with current environmental and associated legislation, all environmental management procedures and actions must be reviewed and refined on an On-going basis. This is in accordance with the dynamic nature of environmental management and allows for the timeous identification and mitigation of issues as they come to light. The process of review and refinement, built into the requirements of the EMP, is known as monitoring and auditing.

4.1.2. Roles and responsibilities

Efficient implementation of the performance specifications, effective monitoring and auditing, as well as clear responsibility and accountability allocation requires that various role-players be defined for the construction implementation project.

Depending on the nature and scale of a project, implementing teams could be composed of any number of role-players, each with their own specified responsibilities.

Therefore, for the purpose of this document, the following role-players are defined, based purely on responsibility and accountability allocation. The actual designation of role-players may vary, but the responsibilities will largely remain as stated.

4.1.2.1. Developer/landowner or custodian of the land

The developer/landowner or custodian of the land is the person or organization with decision making capacity for the land in question, and thus ultimately accountable for what takes place on that land.

4.1.2.2. Contractor

Contractors are appointed to undertake the works as specified in the contract. It is the responsibility of the contractor to do whatever is necessary from their side to ensure that he or an appointed advisor is well versed in environmental studies, so that they may accurately and efficiently carry out the requirements of the environmental specification.

The contractor is liable for any and all remedial work required in terms of the environmental specification, resulting from his environmental negligence, mismanagement and / or non-compliance.

4.1.2.3. Environmental Control Officer

An environmental control officer will manage and undertake monthly environmental inspections for the duration of the construction phase of the project as required.

The contractors or line management are answerable to the ECO for non-compliance. Issues of non-compliance raised by the ECO/EO must be taken up by the project manager, and resolved as per the conditions of his contract.

Decisions regarding environmental procedures, specifications and requirements which have a cost implication (i.e. those that are deemed to be a variation and not allowed for in the performance specification) must be endorsed by the project manager.

4.2 The Monitoring Procedure

Environmental monitoring is the continuous evaluation of the status and condition of environmental elements. Its purpose is to detect change that takes place in the environment over time and involves the measuring and recording of physical, social and economic variables associated with development impacts.

Many techniques for environmental monitoring have been proposed, each detailing a specific protocol. Regardless of which technique is used, the ultimate aim is that each environmental management specification be checked by means of a system in which a score may be allocated for:

- Full compliance;
- Satisfactory performance;
- Unsatisfactory performance; and
- No action taken.

Completed monitoring reports will be submitted to the project engineer, developer/landowner and the contractor, who will attend to issues. These reports must be kept on file and be made available upon request by any environmental authority requesting such.

All persons employed, the contractor or his sub-contractors, must abide by the requirements of these performance specifications as they apply to the works. Any employees, the contractor or his sub-contractors found to be in breach of any of the environmental specifications, may be ordered to vacate the site forthwith and/or be subject to a disciplinary process.

The order may be given orally or in writing by the ECO. Confirmation of an oral order will be given as soon as practicable, but lack of confirmation in writing must not be a cause for the offender to remain on site, or not be subject to a disciplinary process. Supervisory staff, the contractor or his sub-contractor may not direct any person to undertake any activities which would place such person in contravention of the EMP, legislation and specifications.

The contractor and staff are deemed not to have complied with the performance specifications if:

- There is evidence of wilful or accidental contravention of any specification included in the specification;
- There is evidence of the contractor carrying out activities not permitted in terms of the EMP, contract and / or the specification;
- There is evidence of environmental negligence and / or mismanagement resulting in negative impacts on the environment;
- Has failed to meet with the requirements of the approved schedule.

The contractor and developer/landowner will be informed via ECO monthly reports, as well as by means of direct instruction (if necessary) as to what corrective actions are required in terms of environmental compliance.

Disregard for an instruction, and failure to respond adequately to complaints from the public will be construed as non-compliance. Non-compliance may lead to parties being penalised.

In more serious cases, the ECO may give notice, and halt operations until such a time that the corrective action is taken and the site complies with the performance specifications.

In cases of persistent non-compliance, the contractor or staff may be evicted from site after disciplinary process is followed. Only the developer/landowner may issue such instruction, retaining any costs required to remedy situations perpetuated by environmental negligence, mismanagement and / or non-compliance.

4.3 The Auditing Procedure

Environmental auditing is the process of comparing the impacts predicted with those which have actually occurred during implementation.

An environmental performance audit examines and assesses practices and procedures which, in the event of failure, would cause an environmental impact or result in an environmental risk. During

each of the lifecycle phases, various issues will be monitored. The performance audit will ensure that the monitoring was correctly undertaken and that compliance was best achieved.

To these ends the project will be audited versus this EMP for effectiveness. ISO/SANS 19011:2013 auditing standards will be applied.

Audits will be undertaken at completion of the construction phases. Audit reports will be submitted to management, who will attend to all noted issues.

These reports must be kept on record and be made available upon request by the developer/landowner/custodian of the land and any environmental authority or I&AP requesting such.

4.4 Retentions and Penalties

It is recommended that a penalty retention system be combined with the penalty system to both motivate and compel the contractor to adhere to the EMP for the duration of the contract. In this way incentives may be created to perform (i.e. in the form of the retention amounts that will only be paid to the contractor at the end of the contract), without creating the misunderstanding that adherence to the EMP is optional.

Persistent non-compliance will not only result in the contractor forfeiting any retention amount, but he will also be fined.

Of importance is that the contract specifies exactly how the penalty and retention system will operate, as well as how any funds resultant from retentions and penalties will be utilised.
All such funds must be used to improve environmental conditions on the site in general.

4.4.1. The Retention System

For this system, a percentage value for each of the sections priced for in the environmental bill of quantities is retained until the full completion of the contract works.

If the monitoring process reveals persistent and/or wilful non-compliance with any aspect of the environmental performance specifications, then the full retention associated with that particular item will be withheld.

The project may then apply these retained funds to rectify the problem on site possibly making use of other or alternate resources at his disposal.

At the end of the contract or action, all remaining environmental retention amounts will be paid out to the contractor or staff pending approval by the ECO, after having confirmed full compliance with the relevant performance and rehabilitation specifications.

4.4.2. Penalty System

A system of penalties will be introduced to reinforce environmentally sensitive and prudent behaviour. The maximum penalties that will be fined per incident that may be enforced are listed below. The penalty amount will be determined (inter alia) by the severity of the offence.

Non-compliance	R 5 000.00 (ex VAT) per

	non-compliant act, per day until compliance is achieved
Casual Litter on site resulting from operation	R250 / offence / day
Disposal of any litter or construction material in non-specified area or by non-compliant means	R5000 / m^3 / per day
Dumping of cement, concrete, fuel or oil in an area or other than that authorised and suitable	R10 000 per offence / day
Failure to use portable / toilets	R100 / observed incident or evidence of human excrement on site

In addition to the above, all costs incurred by the client / developer to remedy any damage will be the responsibility of the offender.

Should the monitoring process reveal acts of persistent and / or wilful non-compliance with the environmental performance specifications, then the contractor or staff member will be fined according to the specified value of that item.

4.5 Method Statements

Contractors must provide written statements for discussion with the ECO on environmentally sensitive aspects of the contract. Environmentally sensitive aspects include by example excavations, work close to sensitive areas, collection and storage of top soil and vegetation, erosion control, wash water control, waste control, etc.

CHAPTER 5

This section of the report is included in compliance with Section 24N (2) (e) of the National Environmental Management Act 107 of 1998.

5.1. Good Housekeeping

The developer/landowner will ensure the maintenance of “good housekeeping” practices during operations.

This will help avoid several disputes regarding responsibility and will allow for the smooth running of the operation as a whole.

Good housekeeping extends beyond the environmentally sensitive construction methods to include the care for and preservation of the surrounding environment.

5.2 Record Keeping

The developer/landowner will ensure that a filing system, identifying all documentation related to the EMP, is established.

A list of reports likely to be generated during the project is set out below.

All applicable documentation must be included in the environmental filing system catalogue or document retrieval index.

- Approved EMP, authorizations, licenses or permits;
- Final design documents and diagrams issued;
- All communications detailing changes of design/scope that may have environmental implications;
- Daily, weekly and monthly site monitoring reports;
- Complaints register;
- Environmental training manual;
- Environmental training attendance registers;
- Incident and accident reports;
- Emergency preparedness and response plans;
- Copies of all relevant environmental legislation;
- Permits and legal documents as part of emergency preparedness teams e.g. fire teams, etc.;
- Material data sheets of all chemicals utilised on aite;
- Crisis communication manual;
- Disciplinary procedures;
- Monthly site meeting minutes during construction;
- All relevant permits;
- All method statements for all phases of the project.

All registers and records should be kept on site and must be made available to the department on request.

5.3 Document Control

The developer/landowner will be responsible for establishing a procedure for document control.

The document control procedure must comply with the following requirements:

Documents must be identifiable by organisation, division, function, activity and contact person;
Every document must identify the person and their positions, responsible for drafting and compiling the document, for reviewing and recommending approval, and final approval of the document for distribution;

All documents must be dated, provided with a version number and reference number, filed systematically, and retained for a specified period.

The owner will ensure that documents are periodically reviewed and revised where necessary, and that current versions are available at all locations where operations essential to the functioning of the EMP are performed. All documents will be made available to the external auditor.

5.4 Reporting Requirements

All advice and recommendations made by the ECO must with the project engineer/engineers compliance be recorded on site in the site instruction book/ suitable register for his attention.

All spills will need to be documented and reported to DWS and other relevant authorities.

CHAPTER 6

6.1. Public Communication Protocols

This section of the report is included in compliance with Section 24N (2) (e) of the National Environmental Management Act, 107 of 1998.

The developer/landowner must be responsible for regulating public access to information and compliance reporting.

The developer/landowner must respond to third party or public queries and complaints.

The developer/landowner must also be responsible for maintaining the compliance register to record complaints received and action taken. All complaints receive by the facility must be documented.

CHAPTER 7

This section of the report is included in compliance with Section 24 N 2 (d - g) and 3 (a - b) of the National Environmental Management Act, 107 of 1998.

Goal for Planning and Design

Overall Goal for Planning and Design: Undertake the planning and design phase of the development in a way that:

- Ensures that the design of the development responds to the identified environmental constraints and opportunities.
- Ensures that pre-construction activities are undertaken in accordance with all relevant legislative requirements.
- Ensures that adequate regard has been taken of any landowner concerns and that these are appropriately addressed through design and planning (where appropriate).
- Ensures that the best environmental options are selected for the project.
- Enables the development construction activities to be undertaken without significant disruption to other land uses in the area.
- In order to meet this goal, the following objectives have been identified, together with necessary actions and monitoring requirements.

OBJECTIVE PD1: PRE-CONDITIONS

The following pre-conditions must be fully met before any construction activities may commence.

A site meeting between the contractors and the representatives of the developer must take place at least 5 days prior to commencement of construction work to:

- Demarcate micro construction sites, services routes, access routes, working boundaries and no-go areas;
- Discuss methods of stockpiling (vegetation, topsoil, sub-soil, shell-grit, etc);
- Check required toilets and fire-fighting facilities to be in place;
- Discuss and agree restricted access to construction site;
- Sign the Declaration of Understanding (Contractors);
- Discuss and agree communication channels including contact details;
- Discuss and agree areas of responsibility;

- Discuss and agree the demarcation and control of construction and building sites.

Minutes of this site meeting must be kept, and are to be distributed to all parties.

The following equipment must be on every micro or sub site before any construction work is due to start:

- Sufficient and suitable chemical toilet facilities.
- Sufficient refuse bins, which are weather and wind proof, with proper lids.
- 1 x type ABC (all purpose) 12.5 kg fire extinguisher

This will be monitored by the ECO during site visits and recorded, reported and proof included in the audit report to be submitted once construction is completed.

OBJECTIVE PD2: LAYOUT PLAN CONTROLS

The contractor must ensure that a copy of the signed approved layout plan is available at the office on site at all times for inspection by the developer or his representative(s). Any variation to the approved layout plan must be submitted to the developer for signed approval and may only be implemented once the approved variation is available to the contractor and available on site at the office. The variation of changes to the layout must be approved by the competent authority as per the EA conditions.

This will be monitored by the ECO during site visits and recorded, reported and proof included in the audit report to be submitted once construction is completed.

OBJECTIVE PD3: ADVERTISING

The contractors may place no advertising material on the property unless prior formal written permission has been obtained from the landowner.

This will be monitored by the ECO during site visits and recorded, reported and proof included in the audit report to be submitted once construction is completed.

OBJECTIVE PD4: ENSURE EFFECTIVE COMMUNICATION MECHANISMS WITH THE VARIOUS STAKEHOLDERS

On-going communication with affected and surrounding landowners and key departments is important to maintain during the construction and operational phases of the cemetery. Any issues and concerns raised should be addressed as far as possible in as short a timeframe as possible.

Project Component/s	Storm water structures; Access roads.
Potential Impact	Impacts on affected and surrounding landowners and land uses.
Activities/Risk Sources	Activities associated with facility construction; Activities associated with facility operation.
Mitigation: Target/Objective	Effective communication with affected and surrounding landowners; Addressing of any issues and concerns raised as far as possible in as short a timeframe as possible.

Mitigation: Action/Control	**Responsibility**	**Timeframe**
Compile and implement a grievance mechanism procedure for the public to be implemented during both	Developer	Pre-construction, construction and

the construction and operational phases of the facility. This procedure should include details of the contact person who will be receiving issues raised by interested and affected parties, and the process that will be followed to address issues.		operational phase
Performance indicator	Effective communication procedures in place.	
Monitoring	An incident must be reported in the site book and monitored by the ECO.	

CONSTRUCTION AND REHABILITATION PHASE
CIVIL CONTRACTOR

Goal for Construction Phase

Overall Goal for Construction:
Undertake the construction the cemetery infrastructure in a way that:

- ensures that construction activities are properly managed in respect of environmental aspects and impacts;
- enables construction activities to be undertaken without significant disruption to other land uses in the area, in particular concerning noise impacts, dust, farming practices, traffic and road use, and effects on local residents;
- minimises the impact on the surrounding area;
- minimises impacts on avifauna and other fauna using the site; and
- minimises the impact on the heritage and historical value of the site
- minimise possible health impacts.

Objectives
In order to meet this goal, the following objectives have been identified, together with the necessary actions and monitoring requirements.

OBJECTIVE C1: WORKING HOURS

Civil & Construction Sites	
Mondays to Fridays	06h00 – 19h00
Saturdays & Public Holidays	06h00 – 17h00

Project Component/s	Development site;
Potential Impact	Surrounding landowners and residents are exposed to noise generated from the development site.
Activities/Risk Sources	Activities associated with site construction; Activities associated with site operation.
Mitigation: Target/Objective	Effective communication with affected and surrounding landowners; Addressing of any issues and concerns raised as far as possible in as short a timeframe as possible.

Mitigation: Action/Control	**Responsibility**	**Timeframe**
Contractors may only be present on the site during the public time hours.	Developer and contractor.	Construction and operational phase.

Performance indicator	Effective communication and procedures in place.

Monitoring	This will be monitored by the ECO during site visits and recorded, reported and proof included in the audit report to be submitted once construction is completed.

OBJECTIVE C2: SAFETY

Project Component/s	Development site;
Potential Impact	Safety of surrounding landowners and residents; Safety of personnel working on site.
Activities/Risk Sources	Activities associated with site construction; Activities associated with site operation.
Mitigation: Target/Objective	To protect all involved from incidents and injury

Mitigation: Action/Control	**Responsibility**	**Timeframe**
Telephone numbers of emergency services, including the local fire-fighting services, must be posted conspicuously in the contractor's office and near the telephone. No firearms are permitted on the construction site, other than those authorised by the developer for the property security service provider if needed. Notices should be displayed at all public entrances to the property, warning visitors that they are entering a construction site.	Contractor	Construction and operational phase

Performance indicator	Effective communication and procedures in place.
Monitoring	This will be monitored by the ECO during site visits and recorded, reported and proof included in the audit report to be submitted once construction is completed.

OBJECTIVE C3: SPEED LIMIT

Project Component/s	Development site;
Potential Impact	Speeding motorists and construction vehicles could injure personnel, members of the public or cause damage to property/infrastructure.
Activities/Risk Sources	Activities associated with site construction; Activities associated with site operation.
Mitigation: Target/Objective	To protect all involved from incidents and injury.

Mitigation: Action/Control	**Responsibility**	**Timeframe**
For security and safety reasons the speed limit on the property for all contractors' vehicles is 30 km per hour. The contractor is responsible for ensuring that all his employees, sub-contractors and delivery vehicles adhere to this rule.	Contractor	Construction and operational phase

Performance indicator	Effective communication and procedures in place.
Monitoring	This will be monitored by the ECO during site visits and recorded, reported and proof included in the audit report to be submitted once construction is completed.

OBJECTIVE C4: CONTRACTOR'S CAMP

Project Component/s	Development site;
Potential Impact	Degradation of the natural environment inside/outside of the development area.
Activities/Risk Sources	Activities associated with site construction; Activities associated with site operation.
Mitigation: Target/Objective	To protect and mitigate impacts on the environment.

Mitigation: Action/Control	**Responsibility**	**Timeframe**
The contractor's camp will be indicated by and to landowner management and the ECO on the site. The final location of the contractor's camp will be authorized by the ECO and landowner.	Developer / Contractor	Construction phase

Performance indicator	ECO in conjunction with the landowner will approve construction camp area.
Monitoring	This will be monitored by the ECO during site visits and recorded, reported and proof included in the audit report to be submitted once construction is completed.

OBJECTIVE C5: DELIVERIES TO CONTRACTORS

Project Component/s	Access roads.
Potential Impact	Increased traffic, congestion and noise for surrounding landowners / residents and other road users. Impact on the natural environment.
Activities/Risk Sources	Activities associated with site construction; Activities associated with site operation.
Mitigation: Target/Objective	To protect and mitigate impacts on the environment, surrounding land uses, landowners, and personnel working on site.

Mitigation: Action/Control	**Responsibility**	**Timeframe**
Contractors will at all times be responsible for compliance by their delivery service providers as engaged. Delivery times will be limited to working times as defined in this document. Contractors have the responsibility of advising the property security staff of deliveries expected and to be executed. Contractors must further ensure that drivers of service providers are informed of all procedures and restrictions e.g. which access road to use, speed limits, no-go areas, demarcated construction areas, and maximum allowed vehicle mass etc., as applicable before their first visit to site. Washing of service provider delivery vehicles and equipment will not be allowed on the property and must be carried out elsewhere.	Contractor	Construction phase

Performance indicator	Site is secure and there is no unauthorised entry. No members of the public/ landowners injured.

Monitoring	This will be monitored by the ECO during site visits and recorded, reported and proof included in the audit report to be submitted once construction is completed.

OBJECTIVE C6: ALIEN/INVASIVE PLANTS

Project Component/s	Development site.
Potential Impact	Alien/invasive plant species are allowed to spread into surrounding natural/indigenous vegetation areas.
Activities/Risk Sources	Activities associated with facility construction; Activities associated with facility operation.
Mitigation: Target/Objective	To protect and mitigate impacts on the environment.

Mitigation: Action/Control	**Responsibility**	**Timeframe**
A contractor appointed by the developer and engineer must be tasked to ensure that all weeds and alien/invasive species are removed as instructed and approved by the ECO. No on-site burying, dumping or stockpiling of any weeds and aliens or invasive species must occur. Such should be removed from the site to a suitable dumping site from which seed cannot escape.	Contractor	Construction phase

Performance indicator	All possible introduction and spreading of alien invasive plant species are controlled.
Monitoring	This will be monitored by the ECO during site visits and recorded, reported and proof included in the audit report to be submitted once construction is completed.

OBJECTIVE C7: ARCHAEOLOGY AND PALAEONTOLOGY MANAGEMENT

Project Component/s	Development site;
Potential Impact	The loss of cultural or heritage resources.
Activities/Risk Sources	Activities associated with site construction; Activities associated with site operation.
Mitigation: Target/Objective	To protect and mitigate the potential loss of cultural and heritage resources.

Mitigation: Action/Control	**Responsibility**	**Timeframe**
Should any heritage or fossil remains be exposed during any excavation or related activities, these must immediately be reported to the provincial heritage resource authority of the Western Cape, Heritage Western Cape (in terms of the National Heritage Resources Act, 1999 (Act No.25 of 1999) via the ECO. Heritage remains uncovered or disturbed during earthworks must not be disturbed until inspection and verified by the professional.	Contractor	Construction phase

Performance indicator	Protection of heritage resources

Monitoring	This will be monitored by the ECO during site visits and recorded, reported and proof included in the audit report to be submitted once construction is completed.

OBJECTIVE C8: ANTI-EROSION MEASURES

Project Component/s	Development site; Access roads.
Potential Impact	Wind/water erosion as a result of construction/operation activities.
Activities/Risk Sources	Activities associated with site construction; Activities associated with site operation.
Mitigation: Target/Objective	Reduce the impact of erosion by implementing anti-erosion measures.

Mitigation: Action/Control	**Responsibility**	**Timeframe**
The contractor must take all appropriate and active measures to prevent erosion, especially wind and water erosion, resulting from operations and activities, specifically of storm water control measures to the satisfaction of the ECO/ER. During construction the contractor must protect areas susceptible to wind and water erosion, by installing all the necessary temporary and permanent works. Measures can include brush packing, anchovy net stabilisation, etc. Where required erosion protection measures must be installed. Aspects normally covered in construction contracts in terms of protection of works are standard and are not to be confused with those under environmental legislation. Development footprint must be minimised to ensure minimal disturbance. All areas disturbed during construction must be immediately rehabilitated and stabilised. Create single access points to all construction sites to restrict trampling and erosion. Construction of the new jetties should take place in the dry season. Cement is highly toxic to aquatic fauna and plants and use thereof should be kept to the absolute minimum. If cement is required, ready mix should be used and no cement should be mixed within 30 metres of the vlei. Work within site boundaries with no construction activities outside the boundary of the proposed development. During the construction phase of the project, the impact on the wetland areas should be kept to a minimum. After the construction phase, any impacted areas of the wetland should be rehabilitated. Maintenance of the greened areas adjacent to the wetland should be undertaken in such a manner so as to not impact on the wetland, i.e. use of grass cutting machines within the wetland area. The planting of invasive alien grasses and	Contractor	Construction and operational phase

plants should be avoided in the greened areas. Follow-up work should be carried out after rehabilitation to ensure that no invasive alien plants establish themselves within the wetlands. A buffer strip of at least 30m should be maintained to protect the Apolisvlei wetland from the impacts of the development, while a buffer of 10m on either side of the channel within the area seepage should be maintained. Activities associated with the development should be kept to a minimum within this buffer area. Trampling by people in the wetland areas should be prevented by the construction of a boardwalk that allows access to the wetland without the impact of trampling. The vlei and pan area must remain as a seasonal wetland, and must not become a permanent waterbody. The rehabilitation of the buffer area and vlei must be undertaken by a suitably qualified restoration ecologist, with inputs from the botanist and freshwater ecologist. No alien invasive species may be used. The private and public open space must be planted with a selection of suitable, water wise and locally indigenous Renosterveld and Fynbos species approved by the botanist. Buffer areas (minimum of 30 m) should be maintained adjacent to Adonisvlei to reduce the impact of runoff from the developed site's activities on the wetland after the construction phase. The use of fertilizers particularly on the greened areas adjacent to the wetland should also be prevented as far as possible. The hydrological impacts on aquatic ecosystems, associated with proposed development result from a change of runoff characteristics due to an increased hardening of surfaces. It is recommended that the impact of storm water runoff on the wetland be mitigated as for the water quality impacts. That is through the creation of a wetland buffer area of at least 30m, and to mitigate the impact of increased hardening of surfaces, as far as possible permeable surfaces should be used for the construction of roads and pavements.		

Performance indicator	All possible erosion impacts are controlled and rehabilitated.
Monitoring	This will be monitored by the ECO during site visits and recorded, reported and proof included in the audit report to be submitted once construction is completed.

OBJECTIVE C9: CONSTRUCTION MATERIAL

Project Component/s	Development site;
Potential Impact	Aesthetically displeasing or causing a nuisance to surrounding landowners/residents.
Activities/Risk	Activities associated with site construction;

Sources	Activities associated with site operation.
Mitigation: Target/Objective	Reduce the visual impact or nuisance to the surrounding landowners/residents.

Mitigation: Action/Control	**Responsibility**	**Timeframe**
Construction material will be stored at the contractor's camp, as well as on the construction site within the demarcated working areas at each construction point. Special permission may be obtained from the ECO/ER to store material on suitable substitute or ancillary locations should the need arise, and as communicated by the project engineer.	Contractor	Construction phase

Performance indicator	To minimise the impact on the surrounding land users.
Monitoring	This will be monitored by the ECO during site visits and recorded, reported and proof included in the audit report to be submitted once construction is completed.

OBJECTIVE C10: FIRES

Project Component/s	Development site;
Potential Impact	Uncontrolled fire on/off site, resulting in damage to the environment, property, injuries/death to personnel on site, or injuries/death to the public.
Activities/Risk Sources	Activities associated with site construction; Activities associated with site operation.
Mitigation: Target/Objective	To protect and mitigate the safety of people, property, and the environment on and off site.

Mitigation: Action/Control	**Responsibility**	**Timeframe**
No open fires will be allowed on site and adequate firefighting equipment should be available on site in good working order at all times as prescribed by the fire management protocols.	Contractor	Construction phase

Performance indicator	No fire occurred to damage the surrounding environment and land uses and management actions are in place should a fire occur.
Monitoring	This will be monitored by the ECO during site visits and recorded, reported and proof included in the audit report to be submitted once construction is completed.

OBJECTIVE C11: HERBICIDES, PESTICIDES AND FERTILIZERS

Project Component/s	Development site; Adjacent property/land.
Potential Impact	Adjacent land/property or natural environments contaminated by the application of herbicides, fertilizers and pesticides.
Activities/Risk Sources	Activities associated with site construction; Activities associated with site operation.
Mitigation: Target/Objective	To protect and mitigate impacts on the environment and surrounding land users.

Mitigation: Action/Control	Responsibility	Timeframe
The contractor must make sure of, and allow, all legal requirements regarding herbicide application procedures. It is vital that the contractor becomes familiar with all the information detailed on every herbicide label before using it. The instructions on the label must be strictly followed throughout. The contractor must take all necessary precautions to prevent overspray of herbicides outside of the demarcated construction areas and onto natural veld. All personnel working with any herbicide, pesticide or fertilizer must be registered and comply with the requirements set in these registrations. The contractor must put a system in place to control the use of herbicides and pesticides. All equipment associated to herbicides and pesticides must be maintained in accordance to the set standards. The disposal of all redundant and empty containers of herbicides and pesticides must be controlled and disposed of at a waste management facility licensed under the National Environmental Management: Waste Act.	Contractor	Construction phase

Performance indicator	Herbicide, pesticides and fertilizer use is controlled to prevent impacts on the environment and surrounded land uses.
Monitoring	This will be monitored by the ECO during site visits and recorded, reported and proof included in the audit report to be submitted once construction is completed.

OBJECTIVE C12: AN EFFECTIVE MONITORING SYSTEM TO DETECT ANY LEAKAGE OR SPILLAGE OF ALL HAZARDOUS SUBSTANCES DURING THEIR TRANSPORT, HANDLING USAGE AND STORAGE. THIS MUST INCLUDE PRECAUTIONARY MEASURES TO LIMIT THE POSSIBILITY OF OIL AND OTHER TOXIC LIQUIDS FROM ENTERING THE SOIL OR STORM WATER SYSTEMS.

Project Component/s	Development site;
Potential Impact	Contamination of soil, storm water and ground water resources by hazardous substances.
Activities/Risk Sources	Activities associated with site construction; Activities associated with site operation.
Mitigation: Target/Objective	Prevention and mitigation of the environment contaminated as a result of exposure to hazardous substances.

Mitigation: Action/Control	Responsibility	Timeframe
The EA holder, Landowner, Site Environmental Officer and Environmental Control officer will do daily, weekly and monthly inspections and report and monitor compliance with the management actions included in the EMPr and EA conditions. These monitoring and reporting requirements are recorded in several sections of the EMPr. Monitoring will focus on signs of spillages and procedures during handling and storage of dangerous goods as described in the EMPr. The section on storage and handling of dangerous goods in the EMPr will be	Contractor	Construction phase

enforced. Work within site boundaries with no construction activities outside the boundary of the proposed development. During the construction phase of the project, the impact on the wetland areas should be kept to a minimum. After the construction phase, any impacted areas of the wetland should be rehabilitated. Maintenance of the greened areas adjacent to the wetland should be undertaken in such a manner so as to not impact on the wetland, i.e. use of grass cutting machines within the wetland area. The planting of invasive alien grasses and plants should be avoided in the greened areas. Follow-up work should be carried out after rehabilitation to ensure that no invasive alien plants establish themselves within the wetlands. A buffer strip of at least 30m should be maintained to protect the Apolisvlei wetland from the impacts of the development, while a buffer of 10m on either side of the channel within the area seepage should be maintained. Activities associated with the development should be kept to a minimum within this buffer area. Trampling by people in the wetland areas should be prevented by the construction of a boardwalk that allows access to the wetland without the impact of trampling. The vlei and pan area must remain as a seasonal wetland, and must not become a permanent waterbody. The rehabilitation of the buffer area and vlei must be undertaken by a suitably qualified restoration ecologist, with inputs from the botanist and freshwater ecologist. No alien invasive species may be used. The private and public open space must be planted with a selection of suitable, water wise and locally indigenous Renosterveld and Fynbos species approved by the botanist. Buffer areas (minimum of 30 m) should be maintained adjacent to Adonisvlei to reduce the impact of runoff from the developed site's activities on the wetland after the construction phase. The use of fertilizers particularly on the greened areas adjacent to the wetland should also be prevented as far as possible. The hydrological impacts on aquatic ecosystems, associated with proposed development result from a change of runoff characteristics due to an increased hardening of surfaces. It is recommended that the impact of storm water runoff on the wetland be mitigated as for the water quality impacts. That is through the creation of a wetland buffer area of at least 30m, and to mitigate the impact of increased hardening of surfaces, as far as possible permeable surfaces should be used for the construction of roads and pavements.		

Performance indicator	Impacts on hydrological features minimized and mitigated
Monitoring	This will be monitored by the ECO during site visits and recorded, reported and proof included in the audit report to be submitted once construction is completed.

OBJECTIVE C13: DIESEL FUEL AND LUBRICANT HANDLING PROGRAMME

Project Component/s	Development site;
Potential Impact	Contamination of soil, storm and ground water resources as a result of an oil/diesel/lubricant spill/leak.
Activities/Risk Sources	Activities associated with site construction; Activities associated with site operation.
Mitigation: Target/Objective	To protect and mitigate impacts of contaminants on the environment and hydrological features.

Mitigation: Action/Control	**Responsibility**	**Timeframe**
Servicing of construction vehicles and machinery to take place of site. All vehicles must be in a good condition with no leakages leading to possible contamination of soil or water supplies. The following conditions related to the temporary fuel tanks must be implemented: The fuel tanks must be designed and installed in accordance with relevant Oil Industry standards and SANS codes where applicable for the aboveground storage tanks. The tanks must be located within a bund (110 % of the tanks capacity) in order to contain potential spills. During fuel tanker delivery, the tanker driver must be present at all times during product offloading. Should an incident occur the supply vehicle emergency cut-off switch must be activated to immediately stop fuel delivery. Flexible hoses with dry-break couplings and emergency isolation must be used. All spillage incidences and actions taken consequent thereto must be reported to the ECO and recorded in the site register. All fuel and flammable liquids should be stored under secure and fenced conditions and in a bunded site with the volume of the bunding capable of holding 110% of the liquid. The applicant must ensure that effective stock inventory monitoring and regular auditing take place for the early identification of possible leaks. The requirements of the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993), must be adhered to. Within three months of the tanks ceasing to be used the tanks must be removed at the expense of the applicant,	Contractor	Construction phase

and the site, including all associated infrastructure must be rehabilitated to the satisfaction of the relevant authority. **Refuelling:** Refuelling of equipment must be conducted from the bunded fuel tank and pump at the contractor's camp. Fuel tanks must be bunded and supplied with a concrete apron. The concreted refuelling apron will be constructed with a drain along its extremities to collect any diesel contaminated run-off and channel it to the oil trap where separated oil will be collected and disposed of in the oil recycling container and process. Any spills on the concrete apron of floor below the tank are to be treated with OT8 or Spillsolve or equivalent as per the product instructions. A 500 litre drawn trailer to convey diesel to the equipment for re-fuelling may also be used. Such trailer will be drawn by a specified vehicle and driver, with alternate nominated as approved by the Project Engineer. Such tow vehicle may travel at 20kms per hour maximum at any time, be clearly identifiable as such, and may only tow the diesel cart should the pre requisite drip trays and emergency equipment be on the vehicle at the time. In situ refuelling activity may only take place during a standard specified daily time slot as displayed in the construction office, unless specific per day permission has been given to refuel at any other time by the ECO. This must be pre-recorded in the site record book. Staff will require instruction in the identification of diesel and oil leaks and the use of Spillsolve (or equivalent) products. **On-Site emergency repairs:** Only small mobile plant and emergency repairs are to take place on site. These will require the provision of drip trays and funnels to ensure that no oil or fuel leakages occur onto the ground. Should such spill take place, then the oil saturated soil is to be placed in suitable containers and disposed of at a hazardous waste disposal site. Any contamination of soil is to be treated with Spillsolve or similar product. Contaminated water as a result of an oil or fuel spillage on the area should similarly be treated in appropriate way, and the polluted water should not be specifically removed and not allowed to merge with run-off water collected in the trap collecting all run offs from the slab. **Collection of contaminated spares and waste oils:** Contaminated spares, oil filters, gaskets, water, etc. will be collected in separate holders at the designated		

storage facility for disposal at a licensed H:h site. Staff will require instruction in: • Deleterious effects of oil / fuel on the environment • Identification of oil leaks • Handling of oil / fuel leaks into soil • Location and method in storage of contaminated spares • Fire prevention and emergency drills in case of an accident		

Performance indicator	Ensure that no spillages occur and if it does occur that it is handled and cleaned up accordingly.
Monitoring	This will be monitored by the ECO during site visits and recorded, reported and proof included in the audit report to be submitted once construction is completed.

OBJECTIVE C14: APPROPRIATE HANDLING AND STORAGE OF CHEMICALS, HAZARDOUS SUBSTANCES AND WASTE (WASTE MANAGEMENT PLAN)

The construction phase will involve the storage and handling of a variety of chemicals including adhesives, abrasives, oils and lubricants, paints and solvents. The main wastes expected to be generated by the construction of the facility will include will include general solid waste and liquid waste, and may include hazardous waste.

Project Component/s	Construction camp; Storage areas; Development site; Adjacent land and environmental systems.
Potential Impact	Incorrect storage, handling, transporting and disposing of hazardous substances resulting in the contamination of soil, storm and ground water resources. Incorrect storage, handling, transporting and disposing of general solid waste resulting in litter, storm water pollution, and creating a nuisance to adjacent landowners/residents. Incorrect storage, handling, transporting and disposing of effluent/liquid waste resulting in the contamination of the storm water system, adjacent property, or hydrological systems. Incorrect storage, handling, transporting and disposing of garden waste, alien vegetation or natural vegetation during the clearing phase of the development site. Poor waste management practices, resulting in waste not being reduced, re-used or recycled.
Activities/Risk Sources	Activities associated with site construction; Activities associated with site operation; Vehicles associated with site preparation and earthworks; Packaging and other construction waste; Hydrocarbon use and storage;

	Material from excavation, earthworks and site preparation; Incorrect disposal of waste; Using unregistered waste transporters / facilities.
Mitigation: Target/Objective	Protect and mitigate impacts on the environment and hydrological features; Ensure that the storage and handling of chemicals and hydrocarbons on-site does not cause pollution to the environment or harm to persons; Ensure that the storage and maintenance of machinery on-site does not cause pollution of the environment or harm to persons; Comply with waste management guidelines; Minimise production of waste; Ensure appropriate waste storage and disposal; Avoid environmental harm from waste disposal.

Mitigation: Action/Control	**Responsibility**	**Timeframe**
Implement a site specific waste management plan during the construction phase. Specific areas must be designated on-site for the temporary management of various waste streams, i.e. general refuse, construction waste (wood and metal scrap) and contaminated waste as required. Location of such areas must seek to minimise the potential for impact on the surrounding environment, including prevention of contaminated runoff, seepage and vermin control. Where practically possible, construction and general wastes on-site must be reused or recycled. Bins and skips must be available on-site for collection, separation, and storage of waste streams (such as wood, metals, general refuse etc.). Disposal of waste must be in accordance with relevant legislative requirements, including the use of licensed contractors and disposal at appropriately licensed waste disposal sites. The National Information Systems Regulation must be adhered to in terms of registering and reporting of hazardous waste generated on site via the Integrated Pollutant Waste Information System (IPWIS). All stored fuels to be maintained within a sealed bund and on a sealed surface. The bund must be at least 110% of the volume of the total containers. Adjacent fuelling areas situated around fuel tanks must be provided with an impervious layer or drip trays must be used during refuelling;	Contractor	Construction phase

Areas around fuel tanks must be appropriately bunded or contained in an appropriate manner as per the requirements of SABS 089:1999 Part 1; Fuel storage areas must be inspected regularly to ensure bund stability, integrity, and function; Oily water from bunds at the substations must be removed from site by licensed contractors; The storage of flammable and combustible liquids such as oils will be in designated areas which are appropriately bunded, and stored in compliance with MSDS files; Any storage and disposal permits/approvals which may be required must be obtained, and the conditions attached to such permits and approvals will be compiled with and copies kept on site in the environmental file; Transport of all hazardous substances must be in accordance with the relevant legislation and regulations Construction sub-contractors must provide specific detailed waste management plans to deal with all waste streams; Spill kits must be made available on-site for the clean-up of spills and leaks of contaminants. Corrective action must be undertaken immediately if a complaint is received, or potential/actual leak or spill of polluting substance identified. This includes stopping the contaminant from further escaping, cleaning up the affected environment as much as practically possible and implementing preventive measures. Implement an effective monitoring system to detect any leakage or spillage of all hazardous substances during their transportation, handling, use and storage. This must include precautionary measures to limit the possibility of oil and other toxic liquids from entering the soil or storm water systems. Leakage of fuels must be avoided at all times and if spillage occurs, it must be remediated immediately. In the event of a major spill or leak of contaminants, the relevant administering authority must be immediately notified as per the notification of emergencies/incidents Spilled cement, fly ash and concrete must be cleaned up as soon as possible and disposed of at a suitably licensed waste disposal site. Any contaminated/polluted soil removed from the site must be disposed of at a licensed hazardous waste disposal facility.		

Hydrocarbon waste must be contained and stored in sealed containers within an appropriately bunded area Waste and surplus dangerous goods must be kept to a minimum and must be transported by approved waste transporters to sites designated for their disposal and copies of the safe disposal slips must be kept in the environment file on site. Documentation (waste manifest) must be maintained detailing the quantity, nature, and fate of any regulated waste. Waste disposal records must be available for review at any time. An incident/complaints register must be established and maintained on-site. The sediment control and water quality structures used on-site must be monitored and maintained in a fully operational state at all times; An integrated waste management approach that is based on waste minimisation must be used and must incorporate reduction, recycling, re-use and disposal where appropriate; Upon the completion of construction, the area must be cleared of potentially polluting materials; Dispose of all solid waste collected at an appropriately registered waste disposal site. Waste disposal must be in accordance with all relevant legislation and under no circumstances may waste be burnt on site; Where a registered waste site is not available close to the construction site, provide a method statement with regard to waste management. The storage of waste must comply with the National Environmental Management: Waste Act, (Act No. 59 of 2008) National Norms and Standards for Storage of Waste, 2013.		

Performance indicator	Limited chemical spills outside of designated storage areas; No water or soil contamination by spills; No complaints received regarding waste on site or indiscriminate dumping; Internal site audits ensuring that waste segregation, recycling and reuse is occurring appropriately; Provision of all appropriate waste manifests for all waste streams.
Monitoring	Observation and supervision of chemical storage and handling

	practices and vehicle maintenance throughout construction phase; A complaints register must be maintained, in which any complaints from the community will be logged; Observation and supervision of waste management practices throughout construction phase; Waste collection will be monitored on a regular basis; Waste documentation completed; A complaints register will be maintained, in which any complaints from the community will be logged; Complaints will be investigated and, if appropriate, acted upon; An incident reporting system will be used to record non-conformances to the EMPr; This will be monitored by the ECO during site visits and recorded, reported and proof included in the audit report to be submitted once construction is completed.

OBJECTIVE C15: EFFECTIVE MANAGEMENT OF CONCRETE BATCHING PLANTS

Project Component/s	Concrete batching plant.
Potential Impact	Dust emissions; Release of contaminated water; Generation of contaminated wastes from used chemical containers; Inefficient use of resources resulting in excessive waste generation.
Activities/Risk Sources	Operation of the batching plant; Packaging and other construction waste; Hydrocarbon use and storage; Spoil material from excavation, earthworks and site preparation.
Mitigation: Target/Objective	To protect and mitigate impacts on the environment and surrounding land users. To ensure that the operation of the batching plant does not cause pollution to the environment or harm to persons.

Mitigation: Action/Control	**Responsibility**	**Timeframe**
Concrete batching plants to be sited such that impacts on the environment or the amenity of the local community from noise, odour or polluting emissions are minimised; Access and exit routes for heavy transport vehicles should be planned to minimise noise and dust impacts on the environment; The concrete batching plant site should demonstrate good maintenance practices, including regular sweeping to prevent dust build-up; The prevailing wind direction should be considered to ensure that bunkers and conveyors are sited in a sheltered position to minimise the effects of the wind; Aggregate material should be delivered in a damp condition, and water sprays or a dust suppression agent	Contractor	Construction phase

should be correctly applied to reduce dust emissions and reduce water usage; The site should be designed and constructed such that clean storm water, including roof runoff, is diverted away from contaminated areas and directed to the storm water discharge system; Any liquids stored on site, including admixtures, fuels and lubricants, should be stored in accordance with applicable legislation; Contaminated storm water and process wastewater should be captured and recycled where possible. A wastewater collection and recycling system should be designed to collect and filter contaminated water; Process waste water and contaminated storm water collected from the entire site should be diverted to a settling pond, or series of ponds, such that the water can be reused in the concrete batching process. The settling pond or series of ponds should be lined with an impervious liner capable of containing all contaminants found within the water they are designed to collect; Areas where spills of oils and chemicals may occur should be equipped with easily accessible spill control kits to assist in prompt and effective spill control; Ensure that all practicable steps are taken to minimise the adverse effect that noise emissions. This responsibility includes not only the noise emitted from the plant and equipment but also associated noise sources, such as radios, loudspeakers and alarms; Where possible, waste concrete should be used for construction purposes at the batching plant or project site; The batching plant to be monitored by the ECO to ensure that the plant is operating according to its environmental objectives and within legislative requirements.		

Performance indicator	No complaints regarding dust or contamination; No water or soil contamination by chemical spills; No complaints received regarding waste on site or indiscriminate dumping.
Monitoring	Observation and supervision of chemical storage and handling practices and vehicle maintenance throughout construction phase. A complaints register will be maintained, in which any complaints from the community will be logged. Complaints will be investigated

	and, if appropriate, acted upon. A complaints register will be maintained, in which any complaints from the community will be logged. Complaints will be investigated and, if appropriate, acted upon. An incident reporting system will be used to record non-conformances to the EMPr. Developer or appointed ECO must monitor indicators listed above to ensure that they have been met for the construction phase.

OPERATIONAL PHASE

This following section defines the management programme for each of the identified goals during the operational phase. The programme is presented in the form of a table, which includes the components described. This programme consists of the following components:

Goals
Over-arching environmental goals for the management phase.

Objectives
The objectives are in place in order to meet these goals. These take into account the findings from existing studies and monitoring programmes.

Management Actions
The actions needed to achieve the objectives, taking into consideration factors such as responsibility, methods, frequency, resources required and prioritisation.

Monitoring
*K*ey actions to verify that objectives are being achieved, taking into consideration responsibility, frequency, methods, and reporting.

Criteria/ Targets
The criteria or targets indicate the efficacy of the management programme. The targets should be readily measurable, understandable to the layperson, cost-effective to monitor, and meet legal requirements.

Remedial Actions
Specifies actions needed to be taken if the targets are not met; or if there is an unforeseen event.

Goals
The following 8 are specified goals:
Goal 1: Waste Management
Goal 2: Pollution Control
Goal 3: Water Quality and Storm Water Management
Goal 4: Soil Erosion
Goal 5: Fire Management
Goal 6: Safety, Security and Emergency Procedures (including Fences)
Goal 7: On-going Monitoring of Social Environmental Impacts
Goal 8: Vegetation Management, inclusive of Alien Management and Landscaping

Goal 9: Apolis vlei Management

Goal 1: Waste Management

Objectives	Risks	Actions	Monitoring	Criteria/Targets	Remedial Actions
Ensure allocation of sufficient resources for on-going Integrated Waste Management (E.g. staff, equipment).	Pollution, odours, and nuisances.	1. No solid waste may be incinerated on the property. 2. All vehicles transporting waste must be closed to avoid possible pollution of waste on transport routes. 3. Waste needs to be sorted and recycled were necessary. 4. All waste types to be handled, stored, transported and disposed of according to relevant legislature. 5. Domestic waste not suitable for compost or bio electricity generation needs to be stored in skips for transport to the Local Authorities registered Landfill site. 6. An integrated waste management approach must be implemented on site, based on waste minimisation, reduction, recycling, re-use and disposal where possible. 7. The National Information System Regulations must be adhered to in terms of registering and reporting hazardous waste generated on site via the Integrated Pollutant Waste Information System (IPWIS). 8. All general and hazardous waste generated during construction and operational phases, which cannot be reused or recycled, must be stored separately and disposed of at licenced	Audits of operations vs EMP to identify those requirements that are not being met. **Responsibility:** Developer	Adequate annual Budgets. On-going employment of in house maintenance staff.	• If pollution on site is detected immediate action must be taken to contain the pollution. • Within 24hours of detection the ECO must be informed of the incident, where after the ECO will conduct a site visit and recommend further rehabilitation methods to be implemented. • Depending on the type and extent of pollution that occurred specialists may be contacted to provide specific recommendations. • An incident report is to be compiled and sent to the municipal and relevant governmental authorities.

		waste disposal facilities to accept such waste. In this regard please note that hazardous waste must be stored in containers within a bunded area and be disposed of at a hazardous waste disposal facility. Hazardous waste may not be disposed of with general construction waste. 9. In the event that the storage of general waste (Builders rubble) exceeds 100m^3 or that hazardous waste exceeds 80m3, such storage activities must comply with the National Norms and Standards for Storage of Waste, promulgated in Government Notice No 926 of 29 November 2013.			

Waste Management

Waste is defined as any matter, for which the current user has no further purpose, or any matter, gaseous, liquid, or solid or any combination thereof originating from any residential, commercial or industrial use, which has been discarded, accumulated, or stored.

It further is worth noting that on average 80% of waste management costs accrue to transport.

Principally three types of waste occur-

- Gaseous	Open fires
- High moisture (effluent)	sewerage/waste water/ petroleum products
- Low moisture (solid/semi solid)	glass/plastic/cardboard/paper/domestic/chemical

Some potential consequences-

- Salination of ground/surface/ river water.
- Eutrophication (nutrient enrichment) of natural areas.
- Microbiological contamination of natural areas.
- Sediment and silt migration inflows.
- Harmful inorganic/organic compounds introduction into soil.

Chemical residues and empty containers are required as per purchase contract to be removed ex site by the original supplier. The supplier is asked to further declare that such waste is disposed of within accepted Waste Management Programs standards.

Identified Waste Streams:

Components-
Sewerage (black water)
Sewerage (grey water)
Wet refuse
Dry refuse
Bottles and glass
Tins or cans
Plastic or polypropylene
Garden refuse
Building Rubble
General other waste

Integrated Waste Management Strategy:

Waste Avoidance-
Objective is to promote the concept of minimisation in the generation of any waste in all activities and sites.

Waste Reduction-
To promote the reduction of all waste by ensuring that nothing that can be decomposed is disposed of to waste as opposed to recycling.

Waste Recycling-
Re-using waste or selling waste to recycling companies as far as and if possible to prevent re-usable waste from going to municipal landfill site.

Waste Disposal-
To store, dispose or treat all waste that cannot be avoided, recycled, or composted at licensed facilities within regular operational and environmental monitoring and always in accordance with regulatory requirements.

Storm Water Pollution Management-
Storm water and effluent systems must be separated by cut-off trenches to ensure that storm water is not contaminated by effluent water.

Goal 2: Pollution Control

Objectives	Risks	Actions	Monitoring	Criteria/Targets	Remedial Actions
Ensure allocation of sufficient resources for on-going Integrated Waste and pollution control Management (E.g. staff, equipment, budget).	Pollution, odours and health.	1. Waste to be stored on the property appropriate containers or facilities as provided by the municipality. The storage of waste must comply with the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) National Norms and Standards for Storage of Waste, 2013. 2. All vehicles transporting waste must be closed to avoid pollution of transport routes. 3. Good housekeeping of hazardous waste and other materials on site for the duration of construction will minimize, avoid any spillages and other incidents. All spillages should be reported immediately. 4. All general and hazardous waste generated during construction and operational phases, which cannot be reused or recycled, must be stored separately and disposed of at licenced waste disposal facilities to accept such waste. In this regard please note that hazardous waste must be stored in containers within a bunded area and be disposed of at a hazardous	Audits of operations vs EMP to identify those requirements that are not being met. **Responsibility:** Developer	Adequate annual Budgets. On-going employment of in house maintenance staff.	• If pollution on site is detected immediate action must be taken to contain the pollution. • Within 24hours of detection the ECO must be informed of the incident, where after ECO will conduct a site visit and recommend further rehabilitation methods to be implemented. • Depending on the type and extent of pollution that occurred specialists may be contacted to provide specific recommendations. • An incident report to be compiled and sent to the municipal and relevant governmental authorities.

		waste disposal facility. Hazardous waste may not be disposed of with general construction waste. 5. In the event that the storage of general waste (Builders rubble) exceeds 100m^3 or that hazardous waste exceeds 80m^3, such storage activities must comply with the National Norms and Standards for Storage of Waste, promulgated in Government Notice No 926 of 29 November 2013.			

Goal 3: Water Quality and Storm Water Management Measures

Objectives	Risks	Actions	Monitoring	Criteria/Targets	Remedial Actions
Ensure allocation of sufficient resources for on-going Water Quality and Storm Water Management *(E.g. staff, equipment, budget).*	Pollution, odours, erosion and illegal quality of waste water discharge.	1. Ensure no pollution of any water resources, including surface water, storm water and ground water takes place as a result of any activities on the site. 2. Ensure that no water other than storm water be discharged in the storm water system. 3. All waste within the channels must be removed on a weekly basis. 4. If any erosion and/or degradation of the storm	Audits of operations vs EMP to identify those requirements that are not being met. **Responsibility:** Developer	Adequate annual Budgets. On-going employment of in house maintenance staff.	• If pollution or erosion is detected immediate action must be taken to contain the pollution or erosion. • Within 24hours of detection the ECO must be informed of the incident, where after the ECO will conduct a site visit and recommend further rehabilitation methods to be implemented. • Depending on the type and extent of pollution or erosion that occurred specialists may be contacted to provide specific

		water channel or surrounds are noticed immediate action must be taken to rectify the situation. (Corrective and preventative measures taken will depend upon the type and extent of erosion and/or degradation occurring). 5. Work within site boundaries with no construction activities outside the boundary of the proposed development. 6. During the construction phase of the project, the impact on the wetland areas should be kept to a minimum. 7. After the construction phase, any impacted areas of the wetland should be rehabilitated. Maintenance of the greened areas adjacent to the wetland should be undertaken in such a manner so as to not impact on the wetland, i.e. use of grass cutting machines within the wetland area. The planting of invasive alien grasses and			recommendations. • An incident report to be compiled and sent to the municipal and relevant governmental authorities.

		plants should be avoided in the greened areas. Follow-up work should be carried out after rehabilitation to ensure that no invasive alien plants establish themselves within the wetlands. A buffer strip of at least 30m should be maintained to protect the Apolisvlei wetland from the impacts of the development, while a buffer of 10m on either side of the channel within the area seepage should be maintained. Activities associated with the development should be kept to a minimum within this buffer area. Trampling by people in the wetland areas should be prevented by the construction of a boardwalk that allows access to the wetland without the impact of trampling. 8. The vlei and pan area must remain as a seasonal wetland, and must not become a permanent waterbody. 9. The rehabilitation of the buffer area and vlei must be			

		undertaken by a suitably qualified restoration ecologist, with inputs from the botanist and freshwater ecologist. 10. No alien invasive species may be used. 11. The private and public open space must be planted with a selection of suitable, water wise and locally indigenous Renosterveld and Fynbos species approved by the botanist. 12. Buffer areas (minimum of 30 m) should be maintained adjacent to Adonisvlei to reduce the impact of runoff from the developed site's activities on the wetland after the construction phase. The use of fertilizers particularly on the greened areas adjacent to the wetland should also be prevented as far as possible. 13. The hydrological impacts on aquatic ecosystems, associated with proposed development result from a change of runoff characteristics due to an increased hardening of			

		surfaces. It is recommended that the impact of storm water runoff on the wetland be mitigated as for the water quality impacts. That is through the creation of a wetland buffer area of at least 30m, and to mitigate the impact of increased hardening of surfaces, as far as possible permeable surfaces should be used for the construction of roads and pavements.			

Goal 4: Erosion Control

Objectives	Risks	Actions	Monitoring	Criteria/Targets	Remedial Actions
Ensure allocation of sufficient resources) for on-going erosion control management (E.g. staff, equipment, budget)	Erosion, sink-holes and or blocking of storm water systems. Damage to Infrastructure. Two areas were identified. These areas is marked on a map and included in the EMP.	1. On-going control and management of roads, roadways and areas susceptible to erosion. 2. Ensure suitable vegetation cover or surface on non-hardened surfaces. 3. Control runoff of storm water to prevent soil erosion. 4. Avoid the formation of sink-holes on sensitive soils. 5. Management and control of erosion.	Audits of operations vs EMP to identify those requirements that are not being met. **Responsibility:** Developer	Adequate annual Budgets. On-going employment of in house maintenance staff.	• If erosion is detected immediate actions must be taken to contain the erosion. • Within 24hours of detection the ECO must be informed of the incident, where after the ECO will conduct a site visit and recommend further rehabilitation methods to be implemented. • Depending on the type and extent of erosion that occurred specialists may be contacted to provide specific recommendations. • An incident report to be compiled and sent to the municipal and relevant governmental authorities.

Goal 5: Fire Management

Objectives	Risks	Actions	Monitoring	Criteria/Targets	Remedial Actions
Ensure allocations of sufficient resources (E.g. staff, equipment, Budget) for On-going fire management	Pollution, fire, damage to property and health risks.	1. Sufficient fire- fighting equipment to be on site. 2. Yearly pre-fire season clearing and maintenance of fire breaks. 3. Yearly pre-season testing and servicing of fire-fighting equipment.	Six monthly at start and then yearly audits of operations vs EMP to identify those requirements that are not being met. **Responsibility:** Developer	Adequate annual Budgets. On-going employment of staff.	To be determined when required

Fire Management

Such legislation applies to the open countryside beyond urban limits and puts in place a range of legal requirements.

The responsibilities of people who own or control land.

The landowner on whose land a fire may start, or from whose land it may spread across boundaries, must have in place:

- Prepared firebreaks on your boundary, if there is a reasonable risk of fire.
- Have available such equipment, protective clothing and trained personnel required to extinguishing such fire as may occur.
- Take all reasonable steps to notify the fire chief of the local authority should a fire break out.
- Do everything in their reasonable power to stop the spread of the fire.

The Act also requires that should the owner be absent, a known and identified other person responsible needs to be present on or near this land to:

- Extinguish a fire if one breaks out, or assist or instruct others to do so
- Take all reasonable steps to alert the neighbours and Fire Chief.
- The owner may appoint an agent to act on his or her behalf to perform these duties.

Goal 6: Safety and Security Measures and Emergency Procedures

Objectives	Risks	Actions	Monitoring	Criteria/Targets	Remedial Actions
Ensure allocation of sufficient resources for On-going safety, security and emergency procedures (E.g. staff, equipment, and budget).	Pollution, fire, security and health risks.	1. Any emergency incident, originating at the development site, which falls within the definition of section 30(1)a of the National Environmental Management Act (NEMA), Act 107 of 1998, must be dealt with by the facility in accordance with Section 30 of NEMA. 2. In the event of any incident the facility must ensure containment by the responsible person. 3. On-site emergency plans should be reviewed regularly.	Six monthly at start and then yearly audits of operations vs EMP to identify those requirements that are not being met. **Responsibility:** Developer	Adequate annual Budgets. On-going employment of staff.	To be determined when required.

Goal 7: On-going Monitoring of Social Environmental Impacts

Objectives	Risks	Actions	Monitoring	Criteria/Targets	Remedial Actions
Ensure allocation of sufficient resources for On-going monitoring of environmental impacts (E.g. staff, equipment, budget).	Pollution, nuisances and health risks.	1. Internal formal management inspections on a weekly and monthly basis. 2. Vegetation Monitoring once a year (refer to section below). 3. Annual report back to community forum on results and outcomes of the monitoring and audit. 4. Ground and surface water monitoring as per DWS requirements 5. Manage noise impacts in accordance with the neighbouring activities to prevent a nuisance to neighbours	Six monthly at start and then yearly audits of operations vs EMP to identify those requirements that are not being met. **Responsibility:** Developer	Adequate annual Budgets. On-going employment of staff.	To be determined when required.

Goal 8: Vegetation Management, Inclusive of Alien Vegetation and Landscaping.

Objectives	Risks	Actions	Monitoring	Criteria/Targets	Remedial Actions
Ensure allocations of sufficient resources (E.g. staff, equipment, budget) for On-going alien and vegetation management.	Loss of conservation worthy species, fire and health.	1. All alien infested areas should be cleared and followed up. 2. All areas to be kept clear of aliens. 3. The private and public open space must be planted with a selection of suitable, water wise and locally indigenous Renosterveld and Fynbos species approved by the botanist. 4. Buffer areas (minimum of 30 m) should be maintained adjacent to Adonisvlei to reduce	Six monthly at start and then yearly audits of operations vs EMP to identify those requirements that are not being met. **Responsibility:** Developer	Adequate annual Budgets. On-going employment of staff.	To be determined when required.

		the impact of runoff from the developed site's activities on the wetland after the construction phase. The use of fertilizers particularly on the greened areas adjacent to the wetland should also be prevented as far as possible.			

Goal 9: Apolis vlei Management.

Objectives	Risks	Actions	Monitoring	Criteria/Targets	Remedial Actions
Ensure allocations of sufficient resources (E.g. staff, equipment, budget) for On-going alien and vegetation management.	Loss of conservation worthy species and estuary management.	Ensure no pollution of any water resources, including surface water, storm water and ground water takes place as a result of any activities on the site. Ensure that no water other than storm water be discharged in the storm water system. All waste within the channels must be removed on a weekly basis. If any erosion and/or degradation of the storm water channel or surrounds are noticed immediate action must be taken to rectify the situation. (Corrective and preventative measures taken will depend upon the type and extent of erosion and/or degradation occurring). Work within site boundaries with no construction activities outside the boundary of the proposed development. During the construction phase of the project, the impact on the wetland areas should be kept to a minimum. After the construction phase, any impacted	Six monthly at start and then yearly audits of operations vs EMP to identify those requirements that are not being met. Monitoring which will consist of monthly visual inspections of the avian and botanical make-up of the development site, river channel and estuarine CBA immediately to the north (where the proposed bird hide is located), before, during and post-	Adequate annual Budgets. On-going employment of staff.	To be determined when required.

		areas of the wetland should be rehabilitated. Maintenance of the greened areas adjacent to the wetland should be undertaken in such a manner so as to not impact on the wetland, i.e. use of grass cutting machines within the wetland area. The planting of invasive alien grasses and plants should be avoided in the greened areas. Follow-up work should be carried out after rehabilitation to ensure that no invasive alien plants establish themselves within the wetlands. A buffer strip of at least 30m should be maintained to protect the Apolisvlei wetland from the impacts of the development, while a buffer of 10m on either side of the channel within the area seepage should be maintained. Activities associated with the development should be kept to a minimum within this buffer area. Trampling by people in the wetland areas should be prevented by the construction of a boardwalk that allows access to the wetland without the impact of trampling. The vlei and pan area must remain as a seasonal wetland, and must not become a permanent waterbody. The rehabilitation of the buffer area and vlei must be undertaken by a suitably qualified restoration ecologist, with inputs from the botanist and freshwater ecologist. No alien invasive species may be used. The private and public open space must be planted with a selection of suitable, water wise and locally indigenous Renosterveld and Fynbos species approved by the botanist.	construction, should be required. **Responsibility:** Developer		

		Buffer areas (minimum of 30 m) should be maintained adjacent to Adonisvlei to reduce the impact of runoff from the developed site's activities on the wetland after the construction phase. The use of fertilizers particularly on the greened areas adjacent to the wetland should also be prevented as far as possible. The hydrological impacts on aquatic ecosystems, associated with proposed development result from a change of runoff characteristics due to an increased hardening of surfaces. It is recommended that the impact of storm water runoff on the wetland be mitigated as for the water quality impacts. That is through the creation of a wetland buffer area of at least 30m, and to mitigate the impact of increased hardening of surfaces, as far as possible permeable surfaces should be used for the construction of roads and pavements.			

CHAPTER 8

ENVIRONMENTAL REPORTING

In order to ensure that the necessary environmental issues are adequately addressed and recorded, the following environmental reporting must be undertaken:

- Incident reporting; and
- Compliance reporting

See below for a template of an Incident Report to serve as a guideline for the recording and addressing of emergency incidents as and when they occur.

ENVIRONMENTAL INCIDENT REPORT

DATE:	**File Ref:**
NAME:	**Copy to:**
EXACT LOCATION OF INCIDENT:	

SECTION 1 : DESCRIPTION OF INCIDENT

SECTION 2 : REMEDIAL ACTION REQUIRED

Remedial Action Due Date:
Confirmation of implementation: **Name:** **Date:**

SECTION 3 : RELEVANT DOCUMENTATION

SECTION 4 : SIGNATURES

Municipal Engineer:

.....

Name:
Date:

ECO:

.....

Name:
Date:

SECTION 5: DRAWING/SKETCH

CHAPTER 9

DECOMMISSIONING PHASE

As the final phase in the project cycle, decommissioning may present positive environmental opportunities associated with the return of the land for alternative use and the cessation of impacts associated with operational activities. However, depending on the nature of the operational activity, the need to manage risks and potential residual impacts may remain well after operations have ceased.

The decommissioning phase EMP provides specific guidance with respect to the management of the environmental risks associated with the decommissioning stage of a project.

Closure and decommissioning impacts are likely to be similar to the construction phase impacts. The management actions and control under the construction phase EMP need to be implemented to mitigate the negative impacts on the environment and to restore the property to its natural state.

A decommissioning phase is where a structure is removed or otherwise modified to make it incapable for re-use for the original design purpose.

The results of environmental monitoring during the decommissioning phase will be used to assess the impact of the decommissioning on the surrounding environment and demonstrate compliance with regulatory requirements.

The actual scope of the decommissioning environmental monitoring will be established following consultation with the regulatory authorities. The format of decommission management strategy will probably be similar to that of earlier development phases and consist of the following:

- Management Principles

    - Develop monitoring procedures in accordance with standard protocols and the requirements of the environmental legislation.
    - Undertake environmental monitoring during the decommissioning phase as shown below.

Environmental monitoring during the decommission phase will include terrestrial flora rehabilitation monitoring.

CHAPTER 10

REHABILITATION SPECIFICATIONS AND SITE CLEAN-UP

The contractors must ensure that all temporary structures, equipment, materials and facilities used or created on site for, or during construction activities, are removed once the project has been completed. The construction sites must be cleared, and cleaned to the satisfaction of the developer.

Stabilisation and rehabilitation must take place immediately after construction operations have been completed. No vehicles or unauthorised personnel must be allowed onto areas that have been rehabilitated.

The areas impacted during construction must be stabilised and shaped according to the natural surrounding contours. If topsoil was removed during construction the topsoil must be used to stabilise the impacted areas.

The impacted areas must be re-vegetated with indigenous vegetation species within 3 months after completion of construction activities. Rehabilitated areas must be irrigated if required.

If erosion occurred the ECO must be informed immediately who will then recommend erosion mitigation measures to be implemented.

Alien vegetation monitoring of the rehabilitated areas and surrounds must be conducted on an annual basis and if alien vegetation is detected the ECO must be informed immediately who will then recommend eradication methods.

CHAPTER 11

ENVIRONMENTAL AWARENESS INDUCTION COURSE MATERIAL

This section of the report is included in compliance with Section 24N (3) (c) of the National Environmental Management Act 107 of 1998.

WHAT IS THE ENVIRONMENT?

- Soil
- Water
- Plants
- People
- Animals
- Air we breathe

WHY MUST WE LOOK AFTER THE ENVIRONMENT?

- It affects us all as well as future generations
- We have a right to a healthy environment
- A Policy and System will be signed

HOW DO WE LOOK AFTER THE ENVIRONMENT?

- Report problems to your supervisor/ foreman
- Team work
- Follow the rules in the EMP

WORKING AREAS

Workers & equipment must stay inside the site boundaries at all times

RIVERS & STREAMS

- Do not swim in or drink from streams
- Do not throw oil, petrol, diesel, concrete or rubbish in the stream
- Do not work in the stream without direct instruction
- Do not damage the banks or vegetation of the stream

ANIMALS

- Do not injure or kill any animals on the site
- Ask your supervisor or Contract's Manager to remove animals found on site

TREES AND FLOWERS

- Do not damage or cut down any trees or plants without permission
- Do not pick flowers

SMOKING AND FIRE

- Put cigarette butts in a rubbish bin
- Do not smoke near gas, paints or petrol
- Do not light any fires without permission
- Know the positions of fire fighting equipment
- Report all fires
- Do not burn rubbish or vegetation without permission

PETROL, OIL AND DIESEL

- Work with petrol, oil & diesel in marked areas
- Report any petrol, oil & diesel leaks or spills to your supervisor
- Use a drip tray under vehicles & machinery
- Empty drip trays after rain & throw away where instructed

DUST

Try to avoid producing dust

NOISE

- Do not make loud noises around the site, especially near schools and homes
- Report or repair noisy vehicles

TOILETS

- Use the toilets provided
- Report full or leaking toilets

EATING

- Only eat in demarcated eating areas
- Never eat near a river or stream
- Put packaging & leftover food into rubbish bins

RUBBISH

- Do not litter – put all rubbish (especially cement bags) into the bins provided
- Report full bins to your supervisor
- The responsible person should empty bins regularly

TRUCKS AND DRIVING

- Always keep to the speed limit
- Drivers – check & report leaks and vehicles that belch smoke
- Ensure loads are secure & do not spill

EMERGENCY PHONE NUMBERS

Know all the emergency phone numbers:

- Ambulance:
- Fire:
- Police: 10111

FINES AND PENALTIES

- Spot fines of between R20 and R2000
- Your company may be fined
- Removal from site
- Construction may be stopped

PROBLEMS - WHAT TO DO!

- Report any breaks, floods, fires, leaks and injuries to your supervisor
- Ask questions!

ATTENDANCE REGISTER FOR ……	
PLACE …….	TRAINER……
NAME & SURNAME	SIGNED
SIGNED …….	DATE & TIME ……

CHAPTER 12

COMPLIANCE WITH THE ENVIRONMENTAL AUTHORISATION

All conditions of the Environmental Authorisation must be adhered to onsite during the construction-, operational-, decommissioning- and rehabilitation phases of the proposed project. A copy of the Environmental Authorisation must be available on site together with the EMP and all contractors on site must sign the Declaration of Understanding as proof of awareness and understanding of all the conditions to be adhered to on site in terms of the EA and EMP.

CHAPTER 13

UPDATING/ADAPTING THE EMP

Although care has been taken to address all known relevant environmental issues for the development, it will become necessary to add or amend certain procedures or instructions to improve the efficiency of the EMP. Only those additions to, or amendments of, this EMP that will either improve environmental protection or can be proven not to have any negative effects would be considered to be included, and any amendments to the EMP must first be approved by the ECO and competent authority/ies i.e. DEA&DP.

REFERENCES

City of Cape Town (2002) Environmental Management Programme (Version 5) for Civil Engineering Construction Activities.

DEA&DP: Environmental Management Programme. Version 5 (04/2002). Guideline Document for the ECO / ESO and the ER

Department of Water Affairs and Forestry, February 2005. Environmental Best Practice Specifications: Construction Integrated Environmental Management Sub-Series No. IEMS 1.6. Third Edition. Pretoria.