

Figure 10 indicates that the natural vegetation areas still remaining within the Overberg Dune Strandveld vegetation and surrounding the Piet se Bos wetland area are considered to be a Critical Biodiversity Area that must be maintained where still largely natural and rehabilitated where degraded. The filled area is mapped as an ecological support area that must be managed in such a manner to ensure that the CBA does not become degraded particularly in terms of its ecological functionality.

## 9. REHABILITATION MEASURES

The proposed re-development of the Piet se Bos area provides an ideal opportunity to restore some of the lost functionality of the original wetland and to formalise the protection of remnants of the wetland areas. It is however unrealistic to expect that the full functionality of the original wetland would be restored as it would have been prior to the infilling of the current picnic area. The objective should be to create a diversity of habitats in which the landscape plan can give effect to an improved wetland and ecosystem functionality.

### 9.1. REHABILITATION / RESTORATION MEASURES AND CONDITIONS

The following measures, aimed at the re-establishment and rehabilitation of part of the wetland should be used to ensure that wetland functionality is restored:

- Short term rehabilitation: In conjunction with the development of the site, manage kikuyu and other aliens within the area and rehabilitate disturbed micro habitats, landscape reclaimed wetland area to enhance wetland functionality (in particular to mitigate storm water runoff at site) and plant with appropriate hydrophilic vegetation.
- The final 'on-site' design will be informed by the opportunities that are exposed once clearing and excavation commences, additionally following the flooding of the re-established wetland area. This, together with exposure of the soil substrates, will inform the planting and features plan for the wetland.
- Long term rehabilitation and monitoring: Undertake follow-up maintenance thereof to ensure that no invasive alien plants colonize in the area and that re-vegetated areas achieve optimum plant communities.

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#### SPECIFIC CONDITIONS

The proposed development plan and layout plan will address the restoration of a portion of the original wetland. The execution of the proposed development plan should be subjective to the following conditions to ensure the best possible outcome:

- The existing indigenous vegetation and wetland areas that exist to the north and east of the current canal (furrow covered with concrete slabs) may not be shaped or disturbed in any motorised mechanical means. These micro habitats may also not be shaped (sloped) towards the newly proposed drainage channel that will increase drainage and will dry out these areas;
- The edge of the development area must be demarcated in such a way as to facilitate the control of kikuyu grass and to prevent it from growing into the newly created wetland features;
- The kikuyu grass currently growing into the areas beyond the concrete slabs must be removed by hand and kept from overgrowing any of the wetland areas (existing and newly created). If possible also create an encompassing buffer area of about 10m where all kikuyu grass is eliminated. This may best be achieved using a species-specific herbicide prior to commencement of the rehabilitation measures. The advice of a registered and licenced pest control practitioner who is specifically certified to apply herbicides for weed control should be consulted for this purpose.
- A second view platform (T junction from the proposed board walk) should be considered for the cave situated in the north of the site to encourage visitors to stay on the board walk when wanting to view the cave.
- Re-building of wetland soils: During the process of removal of the soils that have been utilised to fill the inner area, it is important to establish the depth of the original wetland soil layer and to excavate to that level or to stockpile the wetland soils for use in the reconstructed wetland.

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#### LANDSCAPING AND PLANT SELECTION

- The ideal time to reshape and plant the wetland is late summer.
- The selection of plants to be planted must be done in such a way as to ensure that plants endemic to the area are selected for planting the portions of rehabilitated

wetland; Any landscaping and re-vegetation of the wetland area over the longer term should be under the direction of a suitably qualified botanist / wetland scientist.

- It may be necessary to hydro-seed some of the cleared areas to prevent erosion. Seeding should be done with a sterile crop specific to the season, mixed with a primary or pioneer species that may have been harvested from the area.
- The selection of the tree species to screen the back of the stage (northern part) must be done in such a way to prevent the overshadowing of the wetlands areas over time and the possible loss of the newly established wetland plants communities.
- The landowner should maintain a programme of progressive alien plant clearing on the site. This programme should be aimed at controlling the growth and regrowth of exotic grasses and the other invasive plants.

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#### WATER LEVELS AND DRAINAGE

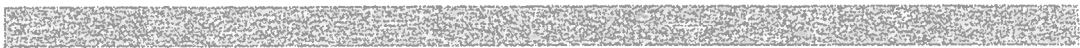
- The existing water channel should be surveyed to ensure that the existing flow patterns are kept or manipulated back to the historical flow pattern based on the discoveries in the soil profiles in terms of the original wetland soil layer.
- The sloping of the site from the proposed amphitheatre towards the proposed drainage channel must be done in such a way as to prevent drainage to be concentrated in one particular area but to support and benefit the newly planted wetland plants all around the developed area.
- The sloping of the development edges towards the proposed newly created drainage channel must be done in such a way as to ensure that newly planted wetland plants will be benefitted and to prevent *Typha* and or *Phragmites* reeds dominating the plant species as a result of stagnant and deep water areas.
- The graduation of the wetland baselevel slope from west to east should be slightly stepped to ensure that the higher lying areas do not drain too rapidly.
- A mix of shallow and deeper water habitats should be created to provide for a diversity of reeds in the deeper water habitat and sedges in the shallow habitats. The design of such a wetland habitat map should be undertaken between a landscape architect and a wetland specialist.
- The creation of a sluice with a gate that allows for the water level in the wetland area to be varied should be installed at the end of the current concrete slab canal. The gate should provide the option in the future to vary the water level so as to allow for the selection of the plant communities in the lower sections of drainage channel.

**10. GUIDELINE FOR LONGER TERM MANAGEMENT AND MONITORING OF WETLAND FEATURES**

The landowner is responsible for implementing all measures described in the rehabilitation, mitigation and proposed landscape measures contained in this report and other environmental authorisation documentation. Table 6 provides a summary of the long term management and monitoring that should be undertaken.

**Table 6:** Summary of long term monitoring and management of the wetland features

Objectives	Risks	Actions	Monitoring	Target
Activities identified as part of the development				
Maintain freshwater habitats and biota	Loss of aquatic habitat and in particular the newly established wetland in and around the drainage channel	Establish a buffer area between the wetland area and the remainder of the development and landscape plan which will allow for control of invasive grasses in the wetland and minimise the impact of the other activities on the re-established wetland. Minimise disturbances in freshwater areas Control invasive alien vegetation growth	Annual site visits to monitor compliance. Check for the changes in plant species compositions to ensure the desired outcome is achieved Monitor re-establishment of wetland area by means of fixed point photography.	Improvement of condition of micro habitats and remnants of the wetland areas; Establishment and maintenance of the newly created wetlands areas; Establishment and maintenance of the wetland diversity (prevention of single species dominance of the wetland areas by <i>Typha</i> and <i>Phragmites</i> )



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*APPENDIX H*

***ENVIRONMENTAL MANAGEMENT PLAN***

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## **ENVIRONMENTAL MANAGEMENT PLAN**

for the  
**MANAGEMENT OF CONSTRUCTION AND  
OPERATIONAL ACTIVITIES RELATING TO THE  
PROTECTION OF THE ENVIRONMENT FOR THE**

**UPGRADING OF THE  
PIET SE BOS AND GROTTO BEACH AREA, ERF  
4771, HERMANUS**

*This EMP is a condition as set out in the DEA&DP Environmental Authorisation  
16/3/11/E2/14/2026/13  
and is to be presented to contractors at the On Site Start-Up Meeting*

compiled by  
*EnviroAfrica (Overberg) CC*

SEPTEMBER 2013

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## TERMS AND ABBREVIATIONS:

The following definitions are applied:

- Audit.- [Site Completion]** Environmental Site Inspection and verification of construction activities to EMP
- Bund** - enclosure under / around a storage facility to contain any spillage.
- Batch plant** - a concrete or plaster mixing facility and associated equipment and materials.
- Contractor** - the principal persons / company and all other sub-contractors involved in the construction of the project.
- Construction phase** - The construction phase period of a Construction Site is defined as from the commencement of site establishment up to and including the practical site handover.
- DEA&DP** Department Environmental Affairs & Development Planning
- Declaration of Understanding** - Form that is signed by all contractors involved in the construction works of their understanding and acceptance of the EMP and site-specific additions to the EMP.
- Development site** - boundary and extent of development works and infrastructure.
- ECO** - Environmental Control Officer: - Must be a suitably qualified independent site environmental consultant appointed to ensure compliance to the EMP.
- ESA** - Environmental Site Agent
- ESO** - Environmental Site Officer - . Must be a person with adequate environmental knowledge to understand and implement the EMP by conducting on site inspections determined by the ECO and the client.
- ECO vs ESO** - ECO might also mean the ESO but the ESO does not mean the ECO. The ESO is responsible to the ECO
- ER** - Engineers representative or Main contractors representative
- On Site Start-Up Meeting** - The OSSM held at site to discuss EMP and determine Site Specific additions that will be included as the basis for the EMP.
- AUTHORISATION** - Directive issued by DEA&DP to commence the activity under certain environmental compliances.
- OSSM**-On Site Start-Up Meeting.

CMC	Cape Metropolitan Council
DEA&DP	Department of Environmental Affairs and Development Planning
DEA	Department of Environmental Affairs
DWA	Department of Water Affairs
EIA	Environmental Impact Assessment
EMP	Environmental Management Programme, although the term Environmental Management <i>Plan</i> is often used interchangeable with <i>Programme</i> .
EMS	Environmental Management System
HWC	Heritage Western Cape
IEM	Integrated Environmental Management
*ECO	Environmental Control Officer
*ESO	Environmental Site Officer
ER	Engineer's Representative
I&AP	Interested & Affected Party
SAHRA	South African Heritage Resources Agency

**Environment** means the surroundings within which humans exist and that are made up of:

- o the land, water and atmosphere of the earth;
- o micro-organisms, plant and animal life;
- o any part of the combination of the above two bullets and the interrelationships between them;
- o the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being.

**Potentially hazardous substance** is a substance, which, in the reasonable opinion of the Engineer, can have a deleterious (detrimental) effect on the environment.

**Method Statement** is a written submission by the Contractor to the Engineer or relevant responsible person such as the Project Leader, in response to the Specification, or a request by the Engineer/Project Leader, setting out the plant, materials, labour, method, responsible persons and timeframe that the Contractor proposes using to carry out an activity, identified by the relevant specification or the Engineer/Project Leader when requesting the Method Statement, in such detail that the Engineer/Project Leader is enabled to assess whether the Contractor's proposal is in accordance

with the Specifications and/or will produce results in accordance with the Specifications. The Method Statement shall cover applicable details with regard to:

- o construction procedures;
- o materials and equipment to be used;
- o getting the equipment to and from site;
- o how the equipment/ material will be moved while on site;
- o how and where material will be stored;
- o the containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or material that may occur;
- o timing and location of activities;
- o compliance/non-compliance with the Specifications;
- o any other information deemed necessary by the Engineer/Project Leader.

**reasonable** means, unless the context indicates otherwise, reasonable in the opinion of the Engineer/Project Leader after he has consulted with a person, not an employee of the client, suitably experienced in "environmental implementation plans" and "environmental management plans", both as defined in the National Environmental Management Act (Act No 107,1998).

**solid waste** means all solid waste, including construction debris, chemical waste, excess cement/concrete, wrapping materials, timber, tins and cans, drums, wire, nails, food and domestic waste (e.g. plastic packets and wrappers).

**contaminated water** means water contaminated by the Contractor's activities, e.g. concrete water and runoff from plant/ personnel wash areas.

**construction site** means the area influenced and affected by the construction activities or under the control of the Contractor, often referred to as "the Site".

**contractor's camp** means the designated and suitably demarcated areas on the Site within which all site offices and staff facilities are situated and within which equipment will be stored, for instance, borrow areas, batching plant, crusher plant, sand washing plant, workshop, offices, rest areas, ablution areas, etc., whichever is applicable.

**construction** means the period of the project during which the actual works are carried out, deemed to include site establishment, site preparation, the works, maintenance period and decommissioning.

**precautionary principle** means the basic principle, that when in doubt or having insufficient or unreliable information on which to base a decision, to then undertake actions that will have minimum risk.

**The CLIENT**

The person/organisation (usually the landowner if the CLIENT or holder of the servitude rights) with rights to undertake the development of the site.

**Audit/Monitoring**

Regular inspection and verification of construction activities for degree of compliance to the Environmental Management Programme.

**Bund**

Enclosure under/around a storage facility to contain any spillage – the storage capacity of the bund must be 120% of the total capacity of the possible spillage amount

**Batch plant**

Machinery used on site for the large-scale mixing and production of concrete or plaster and associated equipment and materials.

**Contract**

An accepted offer to execute specified work within a stated time for a monetary reward. It takes the form of all the documents and drawings issued when tenders are invited (in which the nature and quantity of the work to be executed are set out), the schedules of which documents have been priced by the contractor for completion within a stated time, and the acceptance, in writing, of the Contractor's price) (source: SABS 0120; 1986).

OR

The General Conditions of Contract and Special Conditions, Specifications, Drawings, Tender, written records of matters agreed after the submission of the Contractor's tender, Letter of Acceptance and Agreement, together with other documents which the parties have agreed in writing shall form part of the Contract and such amendments or additions to the Contract as may be agreed in writing between the parties (source: GCC, 1990).

**Contractor**

The natural or juristic person or partnership whose tender has been accepted by, or on behalf of the Employer and where applicable, includes the Contractor's heirs,

executors, administrators, trustees, judicial managers or liquidators, as the case may be.

- Developer** The developer is the person/body responsible for the development of the project and could be the same as, or different to the CLIENT.
- Emergency** A situation requiring immediate action and where failure to implement appropriate actions timeously may result in environmental damage.
- Engineer** A person who represents the CLIENT and is responsible for the technical, environmental and contractual implementation of the works to be undertaken.
- Engineer's Representative** The person appointed from time to time by the Engineer in terms of the General Conditions of Contract. The Engineer's Representative shall:
  - o Observe the execution of the Works, examine and test materials and workmanship and receive from the Contractor such information as he shall reasonably require.
  - o Have the authority:
    - Given to him by any provisions of the Contract.
    - Given to him by the Engineer.
    - To deliver to the Contractor oral or written communications from the Engineer.
    - To receive on behalf of the Engineer oral or written communications from the Contractor.

The powers and authority of the Engineer's Representative would be subject to certain conditions.

**Environmental Awareness Course** An environmental education course for the Contractors management staff and labour force which informs them of the requirements of the EMP.

**Environmental Completion Statement** A report document submitted to the relevant authority showing that the EMP environmental controls were appropriately implemented on a project.

**Environmental Completion Audit** Similar to an Environmental Completion Statement but it is more detailed and will contain detailed information regarding controls and their effectiveness. This document would be required for large projects normally where a professional environmental scientist was appointed as the ECO.

**Environmental Management Programme:** A programme for managing potential impacts identified during the approval process. It could consist of one or more of the following components, depending on necessity dictated by the nature of the development:

- o Standard Environmental Specification
- o Detailed Environmental Specification
- o Guideline documents and tools for implementation by the different role players
- o The Environmental Education Course
- o Standard Revegetation Specification
- o Detailed Revegetation Specification

As mentioned earlier, the term Environmental Management *Plan* is often used interchangeable with Environmental Management *Programme*, and for the purposes of this document will be assumed to have the same definition.

**\*ESO (Environmental Site Officer)** Designation is reserved for suitably qualified environmental site managers, who are to be appointed by the Engineer, and are mainly associated with large and complex developments.

**\*ECO (Environmental Control Officer)** Designation is reserved for suitably qualified authority or officer acting on their behalf. The ECO is usually a professionally registered Environmental Scientist.

**Environmental Specification** For the purposes of this study, this designation is reserved for the combination of the Standard Environmental Specifications and the Detailed Environmental Specifications.

**General Conditions of Contract** A document that sets out the general rights and obligations of the parties to a contract, on such matters as sureties, quality of work, program, supervision, insurance, co-operation with others, provision of plant, material and labour, the regulation of wages, samples, tests, examination, commencement and completion of work, penalties for delay, requirements for maintenance, methods of dealing with defects, variations, measurements and payments, and the settlement of disputes. In South Africa the most widely accepted general conditions of contract for general civil engineering works is the SAICE General Conditions of Contract for Works of Civil Engineering Construction (sixth edition, 1990).

**No Go Areas** Areas identified as being environmentally sensitive in some manner and delineated

	<p>on plan and on the site with pegs or fencing and which are out of bounds to unauthorised persons. Authorisation must be obtained from the Engineer/Project Leader prior to entry.</p>
<p><b>Particular Specification</b> <b>Project Specification</b></p>	<p>A specification that covers construction work involving a specialist type of operation that is not adequately covered in a Standardized Specification.</p>
	<p>A specification that describes the Works in general terms (including the locality, the conditions on Site, the extent of the Contract, the construction programme, and the service facilities available and to be taken into consideration) and that may include clauses that amend or amplify or add to any requirement(s) of a standardized specification (or standard or particular specification) in the sequence in which the requirements and specifications occur in the contract documents.</p>
<p><b>Reference Group:</b></p>	<p>The funding body and major role-players (including the environmental authorities) who may resolve environmental disputes, which could arise between the different role-players on site.</p>
<p><b>Revegetation Specification Site</b></p>	<p>This designation is reserved for the combination of the Standard Revegetation Specifications and the Detailed Revegetation Specifications.</p>
	<p>The boundary and extent of development works and infrastructure, including any areas off the main site on which works are to be carried out in order to allow the development to proceed successfully.</p>
<p><b>Specification</b></p>	<p>A technical description of the standards of materials and workmanship that the Contractor is to use in the Works to be executed, the performance of the Works when completed and may include the manner in which payment is to be made. It is essential for the specifications to be clear, concise and to the point, and use should not be made of ambiguous terms or phraseology.</p>
<p><b>Standard Specification</b></p>	<p>An established or accepted model specification. In South Africa the most widely accepted standard specification for general civil engineering works is the set of SABS 1200 Standardized Specifications (refer to definition below), however, other Standard Specifications such as BS, AAWA and Standard Water Specifications are also used.</p>
<p><b>Standardized Specification</b></p>	<p>A specification that is published by the South African Bureau of Standards (SABS) and that so covers a particular class of civil engineering construction that the specification is generally applicable throughout the Republic of South Africa.</p>
<p><b>Top material</b></p>	<p>This refers to any surface material in the construction area, whether it is soil, fine material or stones including vegetation.</p>
<p><b>Works</b></p>	<p>The works to be executed in accordance with a contract.</p>

# ENVIRONMENTAL MANAGEMENT PLAN FOR THE MANAGEMENT OF CONSTRUCTION AND OPERATIONAL ACTIVITIES RELATING TO THE PROTECTION OF THE ENVIRONMENT FOR THE UPGRADING OF THE PIET SE BOS AND GROTTA BEACH AREA IN HERMANUS

(This EMP is a condition as set out in the DEA&DP Environmental Authorisation 16/3/11/E2/14/2026/13 dated.....)

## 1. INTRODUCTION

This Environmental Management Plan (EMP) forms part of the conditions as set out in the conditions and recommendations as detailed in the DEA&DP Environmental Authorisation. This EMP binds all contractors, sub-contractors and other persons working on the site to adhere to the terms and conditions of the EMP throughout the construction and operation of the upgrading of the (1). Any other Site Specific additional activities decided and agreed upon at the "On Site Start-Up Meeting" must be included to form part of the EMP as this is EMP is a "living document" that needs to be modified where necessary as the project progresses where it will lead to an improvement in the protection of the environment.

### EMP Circulation List

Full copies of this EMP should be made for the ECO, ESO, Site Engineer and/or Contractor. Appendices should also be made and circulated where relevant.

## 1.1 THE AFFECTED ENVIRONMENT

### Topography, existing structures and drainage

The site of the proposed project is located at the present open common grassed area at Grotto beach, directly opposite the swimming beach. The project consists of the proposed upgrade of the present open grassed area at Grotto Beach, Hermanus and the area where the old Nautilus restaurant used to be. The present grassed area used to be an impeneirable wetland with an unpaved path through the surrounding milkwood forest. The wetland was filled in many years ago with all sorts of extraneous material consisting of sand, gravel and even building rubble. The area is well compacted.

At the time of filling in the wetland, a sealed and covered drainage canal was also installed around the whole western, northern and eastern perimeter of the wetland in order to drain seepage water, stormwater and rainfall runoff around the filled-in area to discharge via an existing covered channel and headwall onto Grotto beach. There are a number of springs and seepage water that feed into this drainage canal continuously.

The existing developments on the beach also consists of a lifeguard house and ablution facilities, a parking lot and other paved areas. Dutchies restaurant is also located across the road from the ablution facilities. According to the municipality, Dutchies was originally granted a permit to operate as a beachwear and curio store, but was later granted a

consent use by the Overstrand Municipality to operate as a snack bar cum restaurant during daylight hours.

The proposed upgrade of the area will consist of re-instating a portion of the wetland all around the perimeter of the infilled area by removal of the fill material. This fill material will all be used to create the sloped amphitheatre and stage with raised sloped seating. Between the amphitheatre and the edge of the portion of reinstated wetland there will be a fringe of re-established fynbos that has a raised boardwalk that will allow pedestrians access near the wetland and surrounding milkwood forest. There will also be a viewing platform with seating and information board, to get to within viewing distance of the "grotto" that is formed by rocky overhangs with dripping seepage water and associated wet-cliff vegetation.

On the footprint of the area to the south of the road where the old Nautilus restaurant used to be the intention is to construct a wooden double storey building that can be rented out to a restaurateur. The intention is for this building to have a ground level kiosk and bar area and an upper level more formal eating area.

The current covered drainage channel will be removed to allow the containment of the necessary quantity of seepage and stormwater runoff to the rehabilitated wetland area. The drain channel to the beach will be retained with a weir control to obtain the correct water level for the wetland, but that can allow the access runoff to overflow onto the beach as is presently the situation. The existing headwall on the beach will remain but will be clad with natural stone instead of the bland cement structure that is currently there, to give it a more natural appearance.

The level of the grassed area lies at ~6.0 metres above mean sea level (m.a.m.s.l.) while the road level at 10<sup>th</sup> Street immediately above the rock bank flanking the grassed common is located at 27.0 m.a.m.s.l.

### **Borders and surrounding land uses**

The Grotto beach area falls under the jurisdiction of the Overstrand Municipality and has been used as a popular public recreational area for more than 60 years. Over the years its popularity as a recreational area has increased in leaps and bounds. Above the rocky outcrop elevation that surrounds the common grassed area lies the southernmost boundary of houses that constitutes part of the Hermanus that is known as the Voëlklip area. This area consists of mostly upmarket houses that are either permanently occupied or used as holiday houses, many of which are used only a few times a year.

Immediately across the grassed common, on the seaward side of the tar access road and parking area lies the site of the old Nautilus restaurant that was broken down after it burnt down, to the extent that only parts of the concrete slab base still remains today. There are a number of braai areas dotted around the filled in area of the common. Vehicular access was allowed onto the filled in area in the past but nowadays access is controlled by a boom.

To the south of the road that runs all along the Grotto beach area immediately behind the hummock foredunes, just to the south of the extension of Piet se Bos to the east, lies Grotto beach. This is a long stretch of beach that offers popular area where people walk their dogs, go for long walks and children play and swim.

## Flora

There is no natural vegetation in the area that was infilled and the surface area was planted with kikuyu grass. A band of Milkwood Thicket vegetation in good condition surrounds the area of the proposed upgrade. There is evidence on the western end of milkwood thicket where some milkwoods were removed illegally in the past to create a view of the ocean for a single residence. The Milkwood Thicket vegetation extends to the east in a wide band right up to the parking lot located at the western end of the Kleinriviersvlei.

The original vegetation types that were present on and around the site of the proposed upgrade consisted of Cape Seashore Vegetation right next to the shore. Immediately inland of that there occurred Overberg Dune Strandveld and to the north from the top of the high stone outcrop Agulhas Limestone Fynbos occurred according to the SA National Vegetation Map 2006. These three vegetation types all carry a conservation status of Least Threatened and none are listed under section 52 of the NEM: Biodiversity Act.

## Fauna

There have been reports of a variety of birds mammals and snakes reported from the area surrounding the proposed area to be upgraded. There may be some local disturbance to these fauna, but it must be noted that there is a very large area of similar milkwood thicket vegetation to the east of the proposed project area. In these areas there is minimal human interference and some areas are fenced off to prevent any access.

## 2. COMMENCEMENT OF WORKS

The site project contractors must timeously receive a copy of the EMP and any other further additional information that pertains to site conditions/amendments or deviations from original site plan. This EMP must form part of the Contractors Contract. A copy of the EMP must be on site at all times and available for presentation to any authority requesting to see such document.

No work on site may take place until the following has been complied with. Work also refers to camp establishment, earthmoving activities and any preliminary construction activities.

- o EMP has been approved by the relevant authorities, if this is a condition set in the Environmental Authorisation
- o On-Site Start-Up Meeting has been held
- o Site and No-Go areas have been demarcated
- o Contractors are in possession of the EMP and other relevant documentation
- o Contractors signed the Declaration Of Understanding
- o All mandatory site equipment is in place
- o On Site Environmental Education & Awareness training session has taken place with all relevant construction personnel present.

## 3. ENVIRONMENTAL CONDITIONS OF APPROVAL:

- Environmental Authorisation Conditions Of Approval – see Appendix 9 for full DEA&DP Environmental Authorisation 16/3/1/1/E2/14/2026/13
- Original EIA Reports Recommendations – if applicable (see Appendix 10)
- Local Authority Conditions of Approval – if applicable (see attached as appendices)

#### 4. ISSUES OF CONCERN:

Issues of concern that were identified in the environmental impact assessment process and included in the DEA&DP Environmental Authorisation 16/3/1/1/E2/14/2026/13 in terms of NEMA are given in Appendix 9. These pre-determined environmental issues and respective activities must be addressed during the "On Site Start-Up Meeting" (OSSM) and reflected in the On-Site Start-Up Report.

The Site Specific recommendations as per the Piet se Bos and Grotto Beach area in Hermanus DEA&DP Environmental Authorisation 16/3/1/1/E2/14/2026/13 are to be included and to be reflected in the On-Site Start-Up Report. Such activities may include but shall not be limited or restricted to;

- o Access route
- o Demarcation of working footprint and removal and storage of topsoil material
- o Waste management
- o Mandatory site equipment
- o Establishment of construction site compound and fuel stores
- o Ablution & toilet facilities
- o Refuse management
- o Concrete works & batching proposals
- o Soil erosion control
- o Fire fighting equipment & emergency fire reaction plan
- o Overhead power line and/or AC cable supply route
- o New access road construction

#### 5. ON-SITE START-UP MEETING:

The mandatory on-site start-up meeting that is conducted should preferably take place 14 days but not less than 5 working days prior to commencement of any site/camp establishment, earthworks and/or construction activities. This meeting may also relate to additional discussed information that must be complied with during the entire construction phase.

The On-Site Start-Up Meeting Report is to be attached as Appendix 1 to the Piet se Bos and Grotto Beach area EMP. The Start-Up Meeting Report must include all site-specific issues and arrangements as discussed and agreed on at the On-Site Start-Up Meeting.

The On-Site Start-Up Meeting additional information pertains to specific site construction agreements that was discussed on-site by all the relevant parties and agreed upon and must be included in the On Site Start-Up Meeting Report: (The arrangements and agreements must fall within the conditions as set out in the DEA&DP Environmental Authorisation 16/3/1/1/E2/14/2026/13)

At the on-site start-up meeting (OSSM) the following issues must be addressed:

- o The EMP & other relevant site documents
- o Project to be discussed and all uncertainties are cleared
- o Method statement/s to be discussed

- o Power line installation access routes (if applicable)
- o Road and construction area to be demarcated
- o Materials stockpile and lay down areas to be demarcated
- o Method of stockpiling to be discussed
- o Fire fighting procedures
- o Mandatory fire fighting equipment & fire preventative measures
- o Integrated waste management approach and intentions
- o Placement, type and service of toilets to be agreed upon
- o Placement and type of rubbish bins and removal of rubbish to be agreed upon
- o Labour overnight camp to be demarcated and services agreed upon
- o Environmental Education and awareness training session to all contractors & onsite staff/labour

The following people must attend the on site Start-Up Meeting:

- o A representative from Overstrand Municipality
- o Main contractor's representative.
- o Site supervisor/foreman
- o Environmental consultant (EC/ECO)
- o Environmental site officer (ECO/ESO)

Minutes of the on site Start-Up Meeting will be condensed to a report format and circulated to all attendees of the above named meeting for their perusal and comments if needed. A non-response is deemed to be an acceptance of the contents and agreements of the Report. (Appendix 1)

The main contractor must provide (i) a list of all sub-contractors and their scope of work for the contract and (ii) a time schedule of works to the ECO before commencement of works. The On-site Start-up Meeting (OSSM) report will also form part of this Environmental Management Plan. If any discrepancies between the OSSM report and the EMP arise then the EMP will take precedence until clarification on the discrepancy is clarified. If any discrepancies between the EMP and the DEA&DP Environmental Authorisation 16/3/1/1/E2/14/2026/13 arise then the DEA&DP Environmental Authorisation will take precedence until clarification on the discrepancy is clarified.

NB: It is the responsibility of the main contractors to ensure that all sub- contractors under their control that work on the site during and after the civils contract, are informed of the environmental conditions pertaining to the site. No work is to start until the above is in place and agreed upon.

## 6. METHOD STATEMENT:

Method statements from the contractor may be required, depending on the environmental sensitivity of the proposed activity, for specific sensitive actions on request of the authorities, the Client or ECO. A method statement forms the baseline information on which work in sensitive areas takes place and is a "live document" in that modifications are negotiated between the Contractor and ECO/Client, as circumstances require. All method statements will form part of the EMP documentation and are subject to all terms and conditions contained within the EMP main document. These documents must be available to the authorities for inspection or upon request.

A method statement describes the scope of the intended work in a step-by-step description in order for the ECO and the Client to understand the contractor's intentions. This will enable them to assist in devising any mitigation measures which would minimize environmental impact during these tasks. The Contractor must submit the method statement before any particular construction activity is due to start. Work may not commence until the ECO and Client's Representative have approved the method statement.

Where written Method statements are required, they need to be compiled by the contractor for approval by the ECO and Client's Representative. A "Method Statement" is defined as a written submission by the contractor to the Client setting out the plant, materials, labour and method the contractor proposes to use to carry out an activity, in such detail that the Client and the ECO are able to assess whether the contractor's proposal is in accordance with the specifications and/ or will produce results in accordance with specifications.

The method statement may be required to cover applicable details with regard to:

- o Construction procedures
- o Materials and equipment to be used
- o Getting the equipment to and from site
- o How the equipment/ material will be moved while on site
- o How and where material will be stored
- o The containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or material (of any potential hazardous material) that may occur
- o Disposal of hazardous substances and building materials to appropriately licensed waste disposal facilities
- o Timing and location of activities
- o Control of subcontractors
- o Compliance/non-compliance with the Specifications, and
- o Any other information deemed necessary by the Client and the ECO.

However, the requirement for specific Method statements can only be determined once the On-Site Startup Meeting between the parties has taken place. Please note that a method statement may not be changed or deviated from without documented approval from the Client and the ECO. If approval is also required from DEA&DP, the latter must state the timeframe for such approvals from date of receipt of the Method statement in the Environmental Authorisation in order for the Contractor to build this into the tender documents.

The Contractor must abide by these approved method statements and any activity covered by a method statement must not commence until the Client and the ECO has approved of such method statement. NB: No work may commence or take place until the method statement where required for a specific task has been approved by all relevant parties.

Explanation of method statements and a pro forma method statement sheet that may be completed by the Contractor for each activity requiring a method statement is attached as Appendix 4 & Appendix 5.

## **7. ENVIRONMENTAL DECLARATION OF UNDERSTANDING FOR THE EMP**

The purpose of the Environmental Declaration of Understanding agreement between the Applicant / Client, the Engineer, Contractor and the ECO is;

1. To enforce agreement on compliance by all relevant Parties with the DEA&DP Environmental Authorisation & this Environmental Management Plan.
2. To maintain proof of such an agreement pertaining to the on site requirements of the EMP
3. To spell out the Applicant's responsibility to inform all relevant parties of the DEA&DP Environmental Authorisation & EMP (as per condition of DEA&DP Environmental Authorisation).
4. To protect the environment of the site against environmental damage;
5. To make good any damage to the environment.
6. Ensure that all contractors and sub-contractors are familiar with the EMP & DEA&DP Environmental Authorisation and sign the mandatory Declaration of Understanding indicating their undertaking to work within the management framework to achieve the environmental requirements pertaining to the site as contained in the EMP.

This agreement outlines the obligations on the various parties and forms the basis for the ECO to ensure compliance by all parties with the EMP

## 8. PENALTIES

The Client (on recommendation by the ECO) reserves the right at all times for the duration of this agreement to impose restrictions and associated penalties on the contractor with respect to the specific nature, timing and extent of construction activities on environmentally sensitive sites that are not in keeping with the contents of the EMP.

In instances of non-compliance with the EMP by the contractor (or any of their employees) or sub-contractor/s (or any of their employees) that move on or off the site, the on-site Environmental Site Officer (ESO) must immediately inform the ECO who will issue a written warning indicating the non-compliance to the contractor.

The Client, in consultation with the ECO, has the prerogative to determine the amount of the penalty, if applicable, in accordance with the Penalties for Non-Compliance Schedule of Tariffs (Appendix 2). Such penalty amount, if applicable, must be produced in writing and presented to the contractor within seven (7) calendar days of the written warning. The Client may recover penalties by deducting the fine from the offending contractor.

The contractor will be responsible for all costs incurred where emergency procedures are implemented to deal with accidents impacting on the environment as well as the rehabilitation of such damage in conjunction with the Client, ECO and Site Engineer. In serious cases, at the discretion of the Client and the ECO, any multiple offences can be added together.

The ECO, after consultation with the Client, may also stop the works or part thereof until the situation is resolved. Please note that no extension of time is claimable by the contractor for such work stoppages due to non-compliance with the EMP. These penalties furthermore do not preclude any prosecution under any law or regulation. This set of procedures must be brought to the attention of, and understood by all relevant on-site personnel during the Environmental Awareness Training Course.

## 9. RESPONSIBILITY OF THE CLIENT (as the Applicant)

The Client must be responsible for ensuring compliance with the conditions contained in the DEA&DP Environmental Authorisation by any person acting on his behalf, including but not limited to an agent, servant, employee or any person rendering a service to the CLIENT in respect of the activity, including but not limited to contractors and consultants.

The Client is responsible for appointing the ECO, Site Engineer and Contractor for the duration of the construction contract and for ensuring that the Site Engineer and Contractor fulfil their obligations in terms of this EMP. The Client and or its representative must notify DEA&DP and any other relevant authority, in writing, within 24 hours thereof if any condition of this DEA&DP Environmental Authorisation is not adhered to.

## 10. THE SITE ENGINEER / SITE MAIN CONTRACTOR

The Site Engineer/Site main contractor (whichever is applicable) is responsible for ensuring that the construction contract and daily construction activities as per the original site specifications are implemented in terms of the Construction Phase Environmental Management Plan which includes additional On site Start-Up Meeting agreements.

The Site Engineer/Site main contractor (whichever is applicable) and the ECO are expected to develop a close working relationship and to stay in contact with each other. The Site Engineer issues site instructions to the Contractor and all requests and communications between the ECO and Contractor are via the Site Engineer. The only exception to this is where the ECO needs to issue a "stop works" order on the Contractor or the Site Engineer if serious environmental harm is about to happen or is happening as a result of construction activity. This "stop-works-order" must be confirmed by the ECO as soon as practically possible to all affected construction personnel.

When the ECO is not on site the Site Engineer (assisted by the ESC) will be responsible for implementation of the EMP. Any construction and construction related activities that might lead to damage to the environment should be immediately brought to the attention of the ECO and must be recorded on the ENVIRONMENTAL WEEKLY CHECKLIST (see Appendix 6) by the Site Engineer or the appointed engineer's representative (ESO).

## 11. THE CONTRACTOR

The Contractor must ensure that all of its sub-contractors, employees, suppliers, agents, etc., are fully aware of the environmental issues detailed in the site EMP. The Contractor must liaise closely with the Site Engineer and the ECO and must ensure that the works on site are conducted in an environmentally sensitive manner and fully in accordance with the requirements of the EMP at all times.

Main bulk service providers such as Telkom and Eskom must be advised of the construction activities as well as the requirements of this EMP and the Contractor must be responsible for their activities conducted within their work areas. All contractors working on site must attend the Environmental Awareness Training Course and have proper and competent contractor supervision during their time of contract. If more than one contractor works on the site

simultaneously, then the responsibility lies on each contractor to adhere to the conditions of the EMP and related documents for the duration of the contract.

The supervisors must work closely with the appointed environmental officer and discuss the daily programme with the appointed environmental officer, taking special consideration of any specific method statement requirements. Any problems that might lead to damage to the environment must be discussed prior to commencement of the activity.

The ECO must ensure that the Contractor has signed the "Declaration of Understanding" (Appendix 3) in this environmental management plan before construction commences.

## 12. SITE PERSONNEL: ENVIRONMENTAL AWARENESS TRAINING

All daily site construction personnel must attend an on site induction Environmental Awareness Course and training session together with any site specific environmental training they may require to carry out their duties. All contractor and sub-contractor teams involved in work on site must be briefed on their obligations towards environmental controls and methodologies in terms of this EMP, prior to commencement of any construction and construction related activities

The on site Environmental Awareness Training Course session must take the form of an on-site environmental talk and where necessary relevant demonstrations conducted by the ECO. The on-site Environmental Awareness Training Course session must be aimed at all levels of site contractors, sub-contractors and related site workers and site management. In the case of new workers coming on site throughout the construction programme, the site contractor is responsible to ensure that all new labour arriving on site is made aware of the contents of the EMP and is briefed on the contents of the Environment al Awareness Training Course.

## 13. ENVIRONMENTAL CONTROL OFFICER:

### 13.1 Frequency of site visits:

An ECO must be appointed for the duration of the construction phase (if required by the DEA&DP-Environmental Authorisation). The ECO must comply with the following:

- o Conduct a start-up meeting before construction commences;
- o Conduct an Environmental Awareness Training course for the contractor and labourers;
- o Identify and train a suitably qualified Environmental Site Officer (ESO) who will be permanently on site to monitor the application of the EMP on a continuous basis (if applicable)
- o ECO to monitor the development on weekly basis until development is completed;
- o Conduct a "snag-list" site visit immediately before completion of construction;
- o Conduct a closing down site visit ASAP after completion of the development;
- o Conduct an Environmental Compliance Audit within 6 months after completion of the civil contract.

### 13.2 Requirements for the Posts:

#### Environmental Control Officer: [ECO]

- o A suitably qualified environmental practitioner (preferably with a degree in environmental management) with a sound knowledge of the environment & environmental management principles.
- o A person independent from the Contractor, Client or Project Engineer with 10 or more years of environmental site management and able to ensure EMP compliance monitoring experience on construction projects.

### 13.3 Monitoring responsibilities of the ECO:

- o The ECO will undertake weekly site inspections and to monitor the ESO and assist in environmental tasks to be executed in compliance with the EMP as well as compile the weekly environmental checklists;
- o Is to ensure that the mitigation/rehabilitation measures and recommendations referred to in the DEA&DP Environmental Authorisation are implemented and to ensure compliance with the provisions of the EMP;
- o Must notify DEA&DP and any other relevant authority, in writing, within 24 hours thereof if any condition of the DEA&DP Environmental Authorisation is not adhered to;
- o Is responsible for the environmental issues involved with the construction phase of the project;
- o Co-ordinating any aspect of site activity that may have an effect on the environment;
- o Must work in close conjunction with the Client/ESO/Site representative, contractors and sub-contractors;
- o Must identify and demarcate the impact area i.e. construction footprint area before any construction activities commence;
- o Must demarcate the necessary areas for storage of materials, ablutions, eating areas of contract workers, etc;
- o Must identify 'No go' areas and areas sensitive to erosion and have these areas demarcated. Environmental awareness of the workers is essential. This must be in the form of an on site talk and must be conducted at an appropriate technical level;
- o The ECO will keep a site inspection diary which will be the record of construction progress and environmental compliance and is recorded in the form of an ECO checklist and/or diary entries and photographic records for visual reference. (Appendix 8);
- o These documents must be available to the authorities for inspection upon request. The record must include the out come of meetings/discussions with the contractor and must reflect environmental queries, agreed actions and dates of eventual compliance. These must form part of the official environmental record

### 13.4 Authority of the ECO:

The ECO has the authority to stop works if in his/her opinion there is a serious threat to, or impact on the environment, caused directly by the construction operations. This authority is to be limited to non-compliance to the EMP and emergency situations where consultation with the Client is not immediately available. The ECO is to inform the Client of the reasons for the stoppage and agree on a solution to the problem as soon as possible.

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

### 13.5 Appointment of an ESO. (Environmental Site Officer)

When necessary the ECO may appoint an ESO to carry out the site inspections and the following will apply:

- o The suitably qualified and trained ESO is appointed prior to commencement of construction activities, site inspections are decided upon between the CLIENT and the ECO depending on the environmental sensitivity of the construction areas and site location.
- o The frequency of site inspections is also determined prior to commencement of works but can change if the need arises.
- o The suitable qualified ESO will perform certain functions related to the continued compliance with the EMP under the guidance and instruction of the ECO.

### 13.6 Qualifications of an ESO.

The appointed Environmental Site Officer must fulfil the following criteria:

- o Have proven previous experience as an Environmental Site Officer.
- o Have a sound understanding of the contents of the EMP.
- o Must be able to enforce compliance to all relevant site documents.
- o Have a basic knowledge of the NEMA and other relevant information.
- o A construction background would be advantageous.
- o Must be able to work with site personnel and resident engineers.

## 14. CHANGES TO THE MANAGEMENT PLAN

Although care has been taken to address all known relevant environmental issues for the construction phase, it may become necessary to add or amend certain procedures or instructions to improve the efficiency of the Environmental Management Plan (EMP). Only those additions or amendments of this EMP that will either improve environmental protection or can be proven not to have any negative effect to the immediate and surrounding environment will be considered.

Changes or deviations furthermore have to be motivated in writing by means of a motivation report and the same procedures for acceptance as in the case of a standard Method Statement have to be followed. If any additions or amendments must be submitted to DEA&DP for approval, this must be stipulated in the environmental authorization with a stipulated timeframe of approval so that this can be included in the tender specifications for the Contractor. No deviation from the contents of the EMP is allowed without the above-named prescribed procedures

## 15. RECORD KEEPING

All records relating to the implementation of this management plan (e.g. Declaration of Understanding, ECO Checklist and/or diary, Method Statements, etc.) must be kept together so that it can be retrieved easily. These records must be available for scrutiny by any relevant authorities.

### Photographs

Photographs are to be taken of the site prior to, during and immediately after construction, as a visual reference. These photographs must be stored with other records related to this EMP. Any environmental non-compliance reported must have the support of sufficient photographic proof to mitigate the non-compliance report.

## 16. ENVIRONMENTAL COMPLETION STATEMENT

An Environmental Completion Statement is a report by the ECO/Environmental Consultant to the relevant authorities stating completion of the project and compliance with the EMP and conditions. The following environmental statements may be required to be completed on completion of all site construction activities and submitted in line of sequence to the relevant office for perusal and reference. The required completion statements must be discussed and agreed upon at the On-site Start-up Meeting.

### 16.1 ECO: Environmental Completion Statement:

The ECO must submit an environmental closing statement relating to all environmental and technical issues that occurred on site as well as any conclusions regarding incidents such as written warnings, stoppages of works and penalty fines.

### 16.2 Environmental Audit Report

An Environmental Audit Report must be submitted by the Client to the satisfaction of the Department of Environmental Affairs and Development Planning, within six months after construction has been completed and after the sites have been rehabilitated, whichever is applicable.

## 17. MANAGEMENT SPECIFICATIONS (PROGRAMME)

(This EMP is additional to conditions as set out in the DEA&DP Environmental Authorisation). As there is no definite information on the type of machinery to be used, the sources of material and finer detail discussed between the relevant parties, the following points are presented to be applicable in the case where such elements of the project merit this.

### 17.1 Fauna and Flora

The Contractor must not deface, paint, damage or mark any natural features, if these should occur (e.g. trees, rock formations, buildings, etc.) situated in or around the Site for survey or other purposes unless agreed beforehand with the Engineer and the ECO. Any features

affected by the Contractor in contravention of this clause must be restored/rehabilitated to the satisfaction of the Engineer and the ECO

Except to the extent necessary for the carrying out of the works, flora must not be removed, damaged or disturbed nor must any vegetation be planted. Trapping, poisoning and/or shooting of animals is strictly forbidden. No domestic pets or livestock are permitted on Site. All incidents of harm to any animal or natural vegetation (apart from the agreed upon areas) must be reported to the ECO.

Where the use of herbicides, pesticides and other poisonous substances are to be used, the Contractor must submit a Method Statement and these substances may only be used as approved by relevant act and laws.

### **17.2 Protection and Rescue of Fauna and Flora**

The removal of fauna from the site must be done in accordance with the requirements of the applicable Nature Conservation Ordinance regulating these activities. All flora identified during construction to be rescued must be removed and placed in an area specifically allocated for these plants to ensure that the necessary care thereof will take place until being relocated and planted in designated areas. The areas of vegetation that are to be protected during construction must be demarcated and indicated on a site plan. A Method Statement may be required from the Contractor, detailing the method of fencing for protection of the conservation areas.

### **17.3 Clearing of Vegetation, Stripping & Conservation of Topsoil**

A Method Statement may be submitted detailing the methods to be used for vegetation clearing. All cleared areas must be stabilised as soon as possible. Burning of cleared vegetation on site is prohibited. The burying of cleared vegetation or use as part of backfill or landscape shaping is prohibited unless written approval is obtained from the ECO.

Cleared vegetation may be used for mulch or slope stabilisation of the Site. Should bulk vegetation be removed from the designated working areas (foot print area) then tall vegetation shall first be removed through brush cutting and chipping of larger shrub material; this may be added to the topsoil material stockpiles as mulch. Unless otherwise agreed upon, only indigenous plant material shall be used for this purpose.

Prior to any activities within the demarcated work areas, topsoil material shall be removed to a depth of 300mm or deeper if specified by the engineer in consultation with the ECO, and stockpiled in a designated area for use in rehabilitation of the site post construction. Any area where the topsoil will be impacted by construction activities, including the construction offices and storage areas, must have the topsoil stripped and removed and covered with herbaceous vegetation (other than alien species), overlying grass and other fine organic matter and stockpiled for subsequent use in rehabilitation.

Topsoil storage areas must be convex and should not exceed 2m in height. The Contractor must ensure that the material does not blow or wash away. Topsoil must be treated with care, must not be buried or in any other way be rendered unsuitable for further use (e.g. by mixing with spoil) and precautions must be taken to prevent unnecessary handling and compaction. In particular, topsoil must not be subject to compaction greater than 1 500 kg/m<sup>2</sup> and must not be pushed by a bulldozer for more than 50 m. Trucks may not be driven over the stockpiles.

Topsoil from different soil types must be stockpiled separately and replaced in the same areas from which they were taken if this proves to be the case. Specific attention should be given to the areas that may house rare and threatened species. Topsoil areas must be demarcated in order to ensure the safekeeping of topsoil and to separate different stockpile types.

#### 17.4 Protection of Archaeological & Paleontological remains

If remains or artefacts are discovered on Site during earthworks, work in the vicinity must cease immediately and the Contractor must immediately inform the Engineer and the ECO who must contact the South African Heritage Resources Agency (SAHRA) for information on the appropriate course of action to be taken.

In the event that previously unknown archaeological features are exposed during the construction phase, the Contractor should inform the Engineer and the ECO who will advise the Client on the necessary course of action.

Note that the Contractor may not, without a permit issued by the responsible heritage resource authority, destroy, damage, excavate, alter, deface or otherwise disturb any archaeological site or archaeological material. The latter is a criminal offence under the Heritage Resources Act.

#### 17.5 Appropriate use of Machinery

Contractor must at all times carefully consider what machinery is appropriate to the task while minimizing the extent of environmental damage. The contractor may not operate any machinery including a fuel driven compressor outside the demarcated area. Where practical, all maintenance of plant and machinery on Site must be performed in workshops. If it is necessary to do maintenance outside of a workshop area, the Contractor must obtain the approval of the Engineer and the ECO prior to commencing activities.

All vehicles and equipment must be routinely inspected for fuel and oil leaks and kept in good working order and serviced regularly. Leaking equipment must be repaired immediately or removed from the Site. When servicing equipment, drip trays must be used to collect the waste oil and other lubricants. Drip trays must also be provided in construction areas for stationary plant (such as compressors) and for "parked" plant (such as scrapers, loaders, vehicles). Drip trays should be kept free of water that will float the oil to overspill. All drip trays/bungs to attain a 120% capacity of the plant fuel/oil capacity.

Appropriate 2.5kg (minimum requirement) dry powder SABS approved and service certified fire fighting extinguishers must be easily available at strategic points on the site such as the site office, fuel stores, etc.

#### 17.6 Demarcating and fencing

Final site demarcation must be carried out with all relevant parties (who will be responsible) present for the day-to-day activities on the site and may include;

The Client or his delegated Representative  
 Environmental Consultant  
 Main Contractor or his delegated Representative

Sub-contractor  
Environmental Control Officer  
Environmental Site Officer (if applicable)

The proposed site will be demarcated prior to the commencement of any construction or earth-moving activities and this includes site establishment, the moving of construction material or any other items onto the site, etc. The site will be demarcated with appropriate strong steel dropper poles. A single strand of orange baler twine is to be attached to the dropper poles to indicate boundaries and no-go areas for site personnel and vehicular movement. (Alternative fencing may be decided upon dependent on site requirements).

The construction area i.e. road, stockpile areas and development footprint etc. must be demarcated and fenced off with steel dropper poles and orange baler twine approximately 1m high is considered adequate. The demarcation will be agreed on during the start-up meeting. All fencing and fence placement/positioning must be approved by the ECO on site. Work areas and access routes must be clearly demarcated to minimise environmental impact.

NB Steel dropper poles and orange baler twine has proven to be the most environmentally friendly means of on site demarcation.

In the event that sensitive features are threatened by construction activities, temporary fencing off of these areas (for individual areas such as trees or rocks) or the construction area (when working in a mainly natural environment) is recommended.

The Contractor must maintain in good order all demarcation, fencing and barriers for the duration of construction activities, or as otherwise instructed. Any temporary fencing removed for the execution of any portion of the works is to be reinstated by the Contractor as soon as practicable. The Contractor at the end of the contract must remove all demarcation, fencing or barriers not forming part of the final works on Site. Once in place the demarcation barriers must be maintained and may not be moved or altered without consultation with the site ESO and the main contractor

### 17.7 "NO-GO" Areas

"No-go" areas, if so designated by the EMP, DEA&DP Environmental Authorisation or On Site Start-Up Meeting, are certain pre-determined areas that must be demarcated and avoided by machinery and personnel. The contractor is responsible to ensure that no person, machinery, equipment enter the "No-Go" areas at any time during the contract period.

Areas of special importance will be decided upon between the Engineer, Contractor and the ECO and demarcated as "No go" areas on a site plan and fenced off. Such areas are out of bounds to the Contractor and his staff, sub-contractors and their staff or suppliers and their staff and to any other person involved in the construction, without the written permission specified by the ECO.

### 17.8 Water, Storm water, Erosion & Sedimentation Control

The Contractor must take appropriate and active measures to prevent erosion resulting from his own construction activities and operations as well as storm water control measures to the satisfaction of the ECO. During construction the Contractor must protect areas susceptible to erosion by installing all the necessary temporary and permanent drainage works as soon as possible

Occupants on site must have access to safe drinking water. Water to be supplied by the contractor shall be from a legal source and comply with recognised standards for potable and other uses.

It is illegal to discharge water into a public stream if the quality does not conform to the required health or water standards. Other measures as may be necessary must be taken to prevent the surface water from being concentrated in streams and from scouring the slopes, banks or other areas. All potential hazardous fluids/materials must be protected from the rain to prevent them being washed into storm water channels. All such measures must be discussed with and approved by the ECO.

### 17.9 Fuel, Tar Compounds and Oil

No fuels and flammable materials are to be stored on the site. Basic guidelines to follow if any fuels are to be stored are as follows:

- o These areas must comply with general fire safety requirements.
- o All vehicles, equipment, fuel and petroleum services and containers must be maintained in a good condition that prevents leakage and possible contamination of soil or water supplies. Drip trays are to be used in these storage areas to prevent contamination of the ground in the event of spillages or leaks
- o All plants/fuel tanks must have a bund or drip tray present (whichever is applicable) to use in the event off accidental spillage of oils and fuels and must contain a capacity level of 120% of the capacity of the plant fuel and oil tanks.
- o A suitable leak proof container for the storage of oiled equipment (filters, drip tray contents and oil changes etc.) must be established.
- o Fuels and oils must be safely located in a designated area out of harms way from the elements and safety and fire prevention must be strictly adhered to.
- o All spills are to be recorded in the ESO diary.

Fuel Storage proposals must be cleared by the ECO before any storage or stockpiling takes place.

### 17.10 Hazardous Substances

If potentially hazardous substances are to be stored on site, the Contractor must provide a Method Statement detailing the substances/materials to be used, together with the storage, handling and disposal procedures of the materials to the Engineer and the ECO.

**Paints:** - No paint products may be disposed of on Site and brush/roller wash facilities must be established to the satisfaction of the Engineer and the ECO. Oil based paints and chemical additives and cleaners such as thinners and turpentine must be strictly controlled. A Method Statement detailing the paint management procedures is required.

**Hazardous building materials:** -Hazardous building materials (e.g. asbestos, fibre claddings, refrigerants, coolants, sub-station cooling oils, etc) must be identified and dealt with in accordance with the relevant safety and health legislation. All such material must be separated on Site and disposed off at appropriate licensed disposal sites. The Contractor must supply the ECO with a certificate of disposal. Hazardous materials should be stored under lock and key in designated areas with properly displayed and visible warning signs.

### 17.11 Concrete Works

The Engineer (in collaboration with the ECO) must indicate the permitted location of batching plants (including the location of cement stores and sand and aggregate stockpiles), if these are to be present on Site, on a site plan. A Method Statement indicating the layout and preparation of such facilities may have to be submitted.

Cleaning of equipment and flushing of mixers must not result in pollution of the surrounding environment. All wastewater resulting from batching of concrete must be disposed of via the contaminated water management procedure. Used cement bags must be stored in weatherproof containers to prevent wind dispersion and water contamination. Used cement bags must be disposed of on a weekly basis via the solid waste management system, and must not be used for any other purpose. Cement bags may not be disposed of on-site, but removed on a weekly basis to an approved dumpsite.

All visible remains of excess concrete must be physically removed and disposed of on completion of cement work. Washing the remains into the ground is not acceptable. All excess aggregate must also be removed.

The following recommendations must be implemented to minimise impact.

- o The concrete mixing must take place on top of boarding and/or sheeting so as to protect the ground. This board and or sheeting must be removed from the site once the mixing is complete.
- o Concrete batching to take place at identified areas only in consultation with the ECO.
- o Cement contaminated water may not enter a natural or man-made (e.g. trench / sloop or dam) water system. Preventative measures include establishing sumps from where contaminated water can be either treated in situ or removed to an appropriate waste site.
- o Dry mixing batching areas to be carefully placed in consultation with the ECO.
- o If possible/appropriate ready mix concrete must be used.
- o Cement bags are to be stored securely out of harms way from the elements (wind and rain). Bags have to be covered and placed on plastic sheeting.
- o Sand and stone to be stored on plastic if it is stored outside the future fenced off site.
- o Excess or spilled concrete must be confined within the works area and then removed to a waste site.
- o Wash-down areas must be confined to within the concrete batching area only.

**NB:** In the event of Ready Mix concrete deliveries taking place on site the site foreman must ensure that no wash-down of ready mix trucks takes place on or around the site except, as a last resort, at the concrete batching area where concrete waste water may be contained into the existing bunding pit. Any alternative method of disposal must be approved on the basis of Method Statement to be submitted for the approval of the ECO via the ESO.

### 17.12 Blasting / drilling

In the event where blasting or rock drilling is required, the following recommendations must be implemented:

- o A Method statement may have to be provided for each case separately prior to commencement of blasting works.
- o The contractor must take all necessary precautions to prevent damage to special features and the general environment, which includes the removal of fly rock.
- o The contractor must ensure that no pollution results from drilling operations, either as a result of oil and fuel drips, or from drilling fluid. The contractor must take all reasonable measures to limit dust generation as a result of drilling operations.
- o The ECO must be given 24-hour notice before blasting events.

### 17.13 Fires and smoking

No fires are allowed on site. If smoking is to be allowed on site then arrangements must be made for disposal of cigarette butts. No smoking will be allowed outside the agreed upon areas. Adequate fire fighting equipment according to the fire hazard during the construction period must be available on site and in good working order (at least one type ABC (all purpose) 10 kg extinguisher and two fire beaters per working area). The persons on site must be trained in the use of such equipment.

The main contractor must provide a list of all authorities involved in fire fighting in the region. This list must include emergency contact numbers and must be visible at the site office. It is required that contractors have available [if there is cell phone reception] the emergency telephone numbers of the nearest local Fire Fighting Station and that an emergency fire fighting re-action plan has been drawn up with on site workers and the resident land-owner.

Welding, gas cutting or cutting of metal will only be permitted inside the working areas. The Contractor must pay the costs incurred to organizations called to put out any fires started by him. The Contractor must also pay any costs incurred to reinstate burnt areas as deemed necessary by The Client.

### 17.14 Emergency Procedures

It is the responsibility of the contractor to assess the potential risks to the environment as a result of the project. As such, the contractor must have the necessary standard emergency operating procedures in place to deal with any potential emergency such as oil spills or fire.

All staff should be made aware of the necessary basic emergency procedures in the event of an emergency including injuries to staff. The appropriate equipment and identified personnel to deal with such basic emergencies should be available on site.

**Fire:** The Contractor must advise the relevant authority of a fire as soon as one starts and must not wait until he can no longer control it. The Contractor must ensure that his employees are aware of the procedure to be followed in the event of a fire.

**Spills:** The Contractor must ensure that his employees are aware of the procedure to be followed for dealing with spills and leaks, which must include notifying the Engineer, the ECO and the relevant authorities. Treatment and remediation of the spill areas must be undertaken to the reasonable satisfaction of the ECO and Local Authority.