

# CEN INTEGRATED ENVIRONMENTAL MANAGEMENT UNIT

### **Environmental and Rural Development Specialist**

Amended Environmental Management Plan for the proposed establishment of an "eco-residential" development adjacent to the coast at Aston Bay,

Portion 2 of the Swanlake farm no 755 and the remainder of the farm portions 1, 4A, 4B, 5 and 6,

Eastern Cape

November 2017

| CEN Integrated Environmental Management Onit                                   |
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| REVISIONS TO THE ENVIRONMENTAL MANAGEMENT PROGRAMME                            |
| This document is based on the Draft Environmental Management Programme as      |
| submitted to the DEDEAT by the Glenny Buchner Trust.                           |
| Additions and changes to the report are indicated in blue font and underlined. |
| Formatting changes and deletions are not indicated.                            |
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# Chapter

# Chapter 1: Introduction to the Environmental Management Plan

#### 1.1 Background and Introduction

CEN Integrated Environmental Management Unit was appointed by the to amend the Draft Construction Environmental Management Plan (CEMP) for the proposed development of an eco-residential estate and associated infrastructure on Farm Swanlake no 755 Portions 1, 2, 4A, 4B, 5 and 6, and the remainder of the farm, Aston Bay, Eastern Cape Province. The Draft Plan should comply with the 2014 EIA Regulations. Further the CEMP has been drafted for the Remainder of Farm Swanlake no 755 and excludes Portions 1, 2, 4A, 4B, 5 and 6.

The ownership of the various portions is as follows:

- Portion 1: Valuline 196 (Pty) Ltd.;
- Portion 2: Buchner Trust:
- Portion 3: Agricultural;
- Portion 4: Moongate 195 (Pty) Ltd.;

Portion 5: Terra-Nova Trust;

Remainder: Buchner Trust.

The Environmental Management Plan is applicable to the Remainder of Farm Swanlake No 755 and excludes Portions 1, 2, 4A, 4B, 5 and 6. The Draft EMP was drafted for the full development and was applicable to all owners.

The Glenny Buchner Trust has applied to have the authorisation transferred to:
Arctismart (Pty) Ltd
Fiedel GoPaul (representative)
PO Box 728, Empangeni, 3880
10A Calypso Centre, 2 Krugerrand Road, Richards Bay

Section 24 in Chapter 2 of The Bill of Rights of the Constitution Act No. 108 of 1996, includes an environmental right according to which, "everyone has the right to an environment that is not harmful to their health or well-being and to have the environment protected for the benefit of present and future generations, through reasonable legislative and other measures that prevent pollution and ecological degradation, promote conservation and the sustainable use of natural resources while promoting justifiable economic and social development". In addition, Section 28 of the National Environmental Management Act No 107 of 1998 (NEMA), requires, "every person causing significant pollution or degradation of the environment, to take reasonable measures to prevent it from occurring, continuing or recurring". In order to promote effective environmental management throughout the life-cycle of a project, it is important that management actions arising from Environmental Impact Assessments (EIAs) are clearly defined and translated into an Environmental

Management Plan (EMP) for the design, construction, operation and/or decommissioning phases of a project.

The purpose of this document is to provide a framework for the management of environmental impacts associated with the construction of the Aston Bay "ecoresidential" development. The Environmental Management Plan also identifies and clarifies the roles and responsibilities of key role-players in the implementation of the specific requirements of the construction as well as in monitoring, reporting, auditing and review requirements of this development. This Environmental Management Plan is being compiled in addition to the Final Scoping report. The Environmental Management Plan is relevant to the full development.

#### 1.2 Environmental Assessments Undertaken for the Development

This development was applied for under the NEMA (1998) regulations, thus only a Scoping Report for the proposed development was required and approved by DEDEA in 2009.

During September 2017 Dr Dave McDonald undertook a survey of protected plants. The survey was provided to the planner to finalise a new layout and ensure that all protected plants could be excluded from the development area.

#### 1.3 Terms of Reference

The following Terms of Reference were drafted by CEN IEM Unit and accepted for the project.

- Update the Construction Environmental Management Plan for the Remainder of Farm Swanlake No 755 (including installation of the necessary infrastructure).
- The updated CEMP must conform to the requirements of the 2014 EIA regulations
- The Environmental Management Plan should provide the necessary guideline for the <u>contractors to draft detailed method statements</u> that will allow for sound environmental management and the protection of the biophysical environment during the life-cycle of the project.

Appendix 4 of Regulation 982 of the 2014 EIA Regulations contains the required contents of an Environmental Management Programme (EMPr). The checklist below serves as a summary of how these requirements must be incorporated into the EMPr.

| Requirement                                  | Description                          |
|--|--------------------------------------|
| A EMPr must comply with section 24N of the   | The EMPR has been revised to         |
| Act and include -                            | accommodate the requirements of the  |
|  | Act                                  |
| Details of                                   | Refer Appendix 1.                    |
| The EAP who prepared the EMPr; and           |                                      |
| The expertise of the EAP to prepare an       |                                      |
| EMPr, including a curriculum vitae.          |                                      |
| A detailed description of the aspects of the | The revised development has not been |
| activity that are covered by the EMPr as     | subjected to a review of the 2014    |
| identified by the project description.       | regulations to establish if any      |

| Requirement                                   | Description                             |
|---|---|
|   | additional activities are triggered.    |
| A map at an appropriate scale which           | Not provided – No services report for   |
| superimposes the proposed activity, its       | the revised development is available    |
| associated structures, and infrastructure on  | and it has neot been possible to create |
| the environmental sensitivities of the        | the required map / plan                 |
| preferred site, indicating any areas that     |   |
| should be avoided, including buffers          |   |
| A description of the impact management        | Included in EMPr                        |
| objectives, including management              |   |
| statements, identifying the impacts and risks | No operational activities have been     |
| that need to be avoided, managed and          | included                                |
| mitigated as identified through the           |   |
| environmental impact assessment process       |   |
| for all the phases of the development         |   |
| including –                                   |   |
| Planning and design;                          |   |
| Pre-construction activities;                  |   |
| Construction activities;                      |   |
| Rehabilitation of the environment after       |   |
| construction and where applicable post        |   |
| closure; and                                  |   |
| Where relevant, operation activities.         |   |
| A description and identification of impact    | $\checkmark$                            |
| management outcomes required for the          |   |
| aspects contemplated above.                   |   |
| A description of the proposed impact          | $\checkmark$                            |
| management actions, identifying the manner    |   |

| Requirement                                  | Description                           |
|--|---------------------------------------|
| in which the impact management objectives    |                                       |
| and outcomes contemplated above will be      |                                       |
| achieved and must, where applicable include  |                                       |
| actions to -                                 |                                       |
| Avoid, modify, remedy control or stop any    |                                       |
| action, activity or process which causes     |                                       |
| pollution or environmental degradation;      |                                       |
| Comply with any prescribed environmental     |                                       |
| management standards or practises;           |                                       |
| Comply with any applicable provisions of the |                                       |
| Act regarding closure, where applicable; and |                                       |
| Comply with any provisions of the Act        |                                       |
| regarding financial provisions for           |                                       |
| rehabilitation, where applicable.            |                                       |
| The method of monitoring the implementation  | ✓                                     |
| of the impact management actions             |                                       |
| contemplated above.                          |                                       |
| The frequency of monitoring the              | It is suggested that the external ECO |
| implementation of the impact management      | undertakes monthly audits for the     |
| actions contemplated above.                  | duration of the construction phase    |
| An indication of the persons who will be     | ECO – Louise Mari van Zyl of Cape EA  |
| responsible for the implementation of the    | Prac                                  |
| impact management actions.                   | External ECO to be appointed          |
| The time periods within which the impact     | From immediately prior to             |
| management actions must be implemented.      | commencement of construction to 3     |
|  | months after construction has been    |
|  | completed for most actions.           |

| Requirement                                   | Description                           |
|---|---------------------------------------|
|   | Operational monitoring will commence  |
|   | on the termination of construction    |
|   | monitoring                            |
| The mechanism for monitoring compliance       | <b>✓</b>                              |
| with the impact management actions.           |                                       |
| A program for reporting on compliance,        | <b>√</b>                              |
| taking into account the requirements as       |                                       |
| prescribed in the Regulations.                |                                       |
| An environmental awareness plan describing    | The developer will draft an awareness |
| the manner in which -                         | plan                                  |
| The applicant intends to inform his or her    |                                       |
| employees of any environmental risk which     |                                       |
| may result from their work; and               |                                       |
| Risks must be dealt with in order to avoid    |                                       |
| pollution or the degradation of the           |                                       |
| environment.                                  |                                       |
| Any specific information that may be required | No specific requests received         |
| by the competent authority.                   |                                       |

#### 1.4 Methodology

A number of steps are essential in order to ensure that environmental damage will be minimised or eliminated:

- \* Potential impacts must be identified, and their significance assessed
- Suitable mitigation measures need to be defined

- A system to ensure that the necessary mitigation is being implemented must be established
- \* The effectiveness of the management must be monitored
- The Project Manager, Resident Engineer, Environmental Control Officer and the representatives of the developer must be in a position to verify the work undertaken and to monitor the environmental management process

The purpose of this environmental management plan is to describe:

- How adverse environmental impacts will be managed
- ☀ How environmental damage or degradation will be mitigated
- How site rehabilitation will be undertaken and
- What monitoring is necessary to ensure that the above measures are successful

The Environmental Management Plan should be viewed as a dynamic document, which may require updating and / or revision during the operation and decommissioning of the project.

#### 1.5 Purpose of the Environmental Management Plan

This document presents a basic Environmental Management Plan for the construction phase of the development.

The Environmental Management Plan is intended primarily as a management tool for the contractors who will be appointed to undertake the required work.

The Environmental Management Plan outlines structures and procedures to be employed by the Resident Engineer and the contractors. It is aimed at minimising and managing environmental impacts during the construction phase of the project. The specific aims of the Environmental Management Plan are to:

- Formulate procedures to rectify impacts created through the construction of the various components of the Estate and associated infrastructure and to minimise any additional potential secondary environmental impacts
- Suggest methods to ensure compliance with the Environmental Management Plan, including record keeping.

The successful implementation of this Environmental Management Plan is dependent on its forming part of the project's management system. Without regular checks on performance and corrections of deviations from the environmental objectives, procedures and targets, the Environmental Management Plan will fall into disuse and become ineffective. The Environmental Management Plan, therefore, includes various elements of an Environmental Management System such as objectives and targets, the allocation of responsibilities, checking of corrective action, regular audits, and management review of the system.

#### 1.5.1 Scope of the Environmental Management Plan

This Environmental Management Plan deals with the construction, rehabilitation and site maintenance of the Estate and associated infrastructure.

The Environmental Management Plan provides:

- Environmental guidelines to ensure that environmentally acceptable practices are followed during the construction phase of the project
- Environmental guidelines to ensure the environmentally acceptable practices of the decommissioning of the site.

#### 1.5.2 For whom is the Plan Intended?

The plan is a management tool and will be used primarily by the Developer, Project Manager, Resident Engineer and the contractors responsible for the onsite work.

It is recommended that this Environmental Management Plan should be available to the public upon request.

#### 1.6 Structure of this Environmental Management Plan

**Chapter 1** of this Environmental Management Plan serves to introduce the scope of the Environmental Management Plan and the constraints of the project. The purpose of the Environmental Management Plan is also explained. The Environmental Management Plan is designed for use by the Developer, Project Manager, Resident Engineer and contractors to rectify any adverse environmental impact associated with the project.

**Chapter 2** identifies the land in question and presents some basic management prescriptions. The environment, which will be affected by the development, was fully described in the environmental assessment report and is not repeated in this report.

**Chapter 3** briefly discusses environmental policy. It presents a suggested organisational structure for the project to ensure that responsibilities are allocated and that there is adequate control over the work.

**Chapter 4** recommends general environmental management requirements - with specific objectives and targets - which apply to all stages and elements of the construction process and rehabilitation process.

**Chapter 5** presents elements of the Environmental Management System designed to facilitate the implementation, management and regular audit of the Environmental Management Plan.

A Glossary of Terms is presented in **Chapter 6**.

Chapter

# **Chapter 2: Description of Project and Environmental Management Issue**

The following section identifies the land in question and presents some basic management prescriptions. The environment, which will be affected by the development, was fully described in the environmental assessment report and is not repeated here.

#### 2.1 Project Location

The proposed development site is situated approximately 2 km south of Jeffrey's Bay and 10km north of Paradise beach, in Aston Bay. The subject area falls under the jurisdiction of the Kouga Municipality. The Remainder is 38,5 ha in extent.

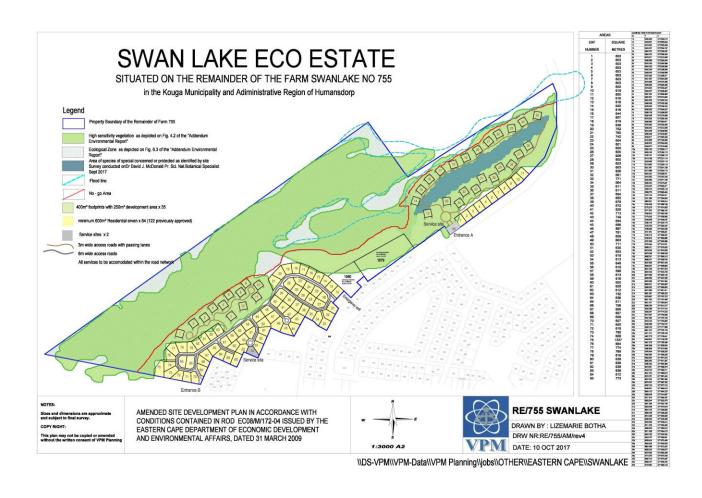


Figure 1: Plan showing the extent of the proposed development. The Plan was revised in October 2017

## 2.2 Project Description (Application)

The Table below was drafted by Louise-Mari van Zyl of Cape Environmental Assessment Practitioners(Pty) Ltd (Cape EAPrac)

| Condition   | Specified in the Environmental       | Plan Compliance                      |
|-------------|--------------------------------------|--------------------------------------|
|             | Authorisation                        |                                      |
| Approval    | 35 development footprints            | ✓                                    |
| description |                                      |                                      |
| Approval    | 122 erven                            | √84 (+ 2 service erven)              |
| description |                                      |                                      |
| Approval    | Single residential erven must be a   | ✓                                    |
| description | minimum size of 600sq/m              |                                      |
| 8.2.2.1     | No development in 'very high         | ✓                                    |
|             | sensitivity' area                    |                                      |
| 8.2.2.2     | Only free standing units' with max   | ✓                                    |
|             | 400sq/m in 'high sensitivity' areas  |                                      |
| 8.2.2.3     | Positioning of 'free standing units' | ✓                                    |
|             | must be such that length of access   |                                      |
|             | roads are minimised.                 |                                      |
| 8.2.2.6     | Total number of units may not        | $\checkmark$ (35 + 84 = 119 which is |
|             | exceed the approved number of units  | 38 erven less than approved          |
|             | i.e. 35 development footprints and   | per the EA)                          |
|             | 122 erven (total 157)                |                                      |
| 8.2.2.7     | The exact location of the 'free      | ✓ indicated on the map               |
|             | standing units' with coordinates for |                                      |
|             | each.                                |                                      |

| 8.2.2.8 | The exact location of other services    | ✓ There is no service report  |
|---------|---|-------------------------------|
|         | and facilities including access roads,  | for the revised development   |
|         | access to erven/units etc.              | however the developer has     |
|         |   | advised as follows:           |
|         |   | Entrances indicated on        |
|         |   | map. All internal services to |
|         |   | be accommodated within 3m     |
|         |   | and 6m road reserves. 2x      |
|         |   | separate service erven        |
|         |   | provided at entrances for     |
|         |   | water storage, sewer          |
|         |   | collection, household waste   |
|         |   | collection.                   |
|         |   | It is recommended that        |
|         |   | services be kept as far as    |
|         |   | possible from any sensitive   |
|         |   | area                          |
| 8.2.2.9 | No encroachment into other              | ✓                             |
|         | 'ecological' areas.                     |                               |
| 8.2.3   | 'Free standing units' may only have     | ✓                             |
|         | an erf size not exceeding 400sq/m.      |                               |
| 8.2.4   | Within each of the 'free standing unit' | ✓                             |
|         | erven a development footprint of only   |                               |
|         | 250sq/m is permitted, inclusive of      |                               |
|         | decks, structures, swimming pools,      |                               |
|         | garages etc.                            |                               |
| 8.2.6   | All roads within the 'high sensitivity  | ✓ Main roads outside of       |
|         | areas' must be restricted to a 3 metre  | high sensitivity areas are    |

|        | width with by-passes only.          | restricted to 6m and inside  |
|--------|-------------------------------------|------------------------------|
|        |                                     | the high sensitivity they're |
|        |                                     | restricted to 3m widths.     |
| 8.2.13 | All areas not indicated for         | ✓                            |
|        | development must be 'private open   |                              |
|        | space'.                             |                              |
| 8.5.4  | Services must all be accommodated   | ✓                            |
|        | within the internal road network.   |                              |
| 8.5.8  | Internal roads must follow contours | ✓                            |
|        | where possible.                     |                              |
| 8.7.18 | The revised layout must be informed | ✓ Dr Dave McDonald of        |
|        | by a botanical survey of protected  | Bergwind Surveys             |
|        | plant species.                      | completed a protected        |
|        |                                     | species survey in            |
|        |                                     | September 2017. The          |
|        |                                     | revised layout plan excludes |
|        |                                     | the areas indicated by Dr    |
|        |                                     | McDonald as containing       |
|        |                                     | such plant species.          |
|        |                                     | Due to the impenetrable      |
|        |                                     | nature of the vegetation Dr  |
|        |                                     | McDonald was unable to       |
|        |                                     | map all protected plants –   |
|        |                                     | belive it would be important |
|        |                                     | to survey to establish the   |
|        |                                     | changes that have taken      |
|        |                                     | place for the initial survey |
|        |                                     | and to classify the          |

|  | vegetation according to the |
|--|-----------------------------|
|  | Step and Mucina and         |
|  | Rutherford classifications  |

#### 2.3 Construction Activities

The following construction activities will be undertaken for the eco-residential development:

- Site clearing and subsequent rehabilitation
- Site office establishment
- Installation of services
- \* Construction of roads
- \* Construction of certain structures on individual erven

#### 2.4 Environmental Planning

#### 2.4.1 Environmental Commitment

All persons involved with the construction must be made aware of the environmental goals and policy for the Estate and encouraged to develop a commitment to compliance with the environmental legislation and to being good neighbours.

#### 2.4.2 Site Planning

Careful consideration to the layout of a construction site prior to any construction commencing will greatly reduce the effort required to meet the environmental and

safety requirements discussed in this Environmental Management Plan. The initial works on any site or stage of an operation are the ones with the greatest potential to create adverse impact. In particular, an inappropriately located initial cut slope or access track may lead to problems for the life of the operation. Comprehensive site planning is essential to the successful and cost-effective rehabilitation of all construction sites.

Rehabilitation planning should commence even before the construction operation commences and all rehabilitation efforts should be focused toward a clearly defined end land use for the area around the site. Sound planning will save time and money in the long run.

Prior to construction commencing the Resident Engineer in consultation with the Site Environmental Control Officer and other project staff must compile a "detailed" site plan indicating where the various infrastructures will be located, and which areas of the selected site will be utilised for construction and associated operations. The plan should include items such as the location of topsoil stockpile sites so as to ensure that the removed topsoil will not be buried or contaminated and will not be in the way of site development. Plans for the location of construction roads / tracks, turning circles, working areas and facilities should seek to minimise the total area that is to be disturbed. A plan of drainage works and the final drainage pattern should generally be included in the rehabilitation plan for the site. Plans for the removal and disposal of wastes and any hazardous or contaminated materials (such as; fuel drums, soil which has been contaminated with leaked fuel or oil, and alien weed infested soil) should be described in the rehabilitation plan, as appropriate for the scale of the operation. The campsite should also be located on the base plan.

The "construction planning" team should plan for the final rehabilitation and restoration of the site before commencing with any construction. In order for final rehabilitation and restoration of the site to be successful, it is essential that the future rehabilitation requirements be considered in the planning stages and that operators plan for progressive rehabilitation while operations are ongoing.

The environmental assessment contains a description of the undisturbed environment (local and sub-regional) and this should be used to guide rehabilitation. Once the final details of a site have been determined the Resident Engineer or his representative / and / or the Site Environmental Control Officer should photograph the proposed construction site and surrounding areas. This photographic record will be invaluable in their rehabilitation work.

The rehabilitation of the construction and surrounding area is an integral part of the construction of the residential estate.

The following issues must be addressed and where appropriate shown on the Environmental Management Site Plan

| Issue              | Nature / Description  |
|--------------------|---|
| Sequence of events | Description of the nature of the process required. Briefly describe the sequence of events that will take place from the time that the contractor moves onto site to the time when the site is handed over to the Project Proponent |

| Issue                                   | Nature / Description   |
|---|--|
| Health and safety                       | Potential risks and hazards and precautions that will be taken Cooking area, hazardous materials site, first aid kit, fuel store |
| On site toilets                         | How many required for the particular development?  How long are the toilets required on site?  Location of toilets (Site Plan)   |
| Workforce                               | Number of onsite workers  Training of workforce in terms of environmental awareness  |
| Transport and traffic                   | Transport required for site workers  Demarcate location of traffic turning circle and parking areas (Site Plan)                  |
| Infrastructure and associated equipment | Nature and extent of access road upgrading / construction Position and area to be covered (Site Plan)                            |

| Issue                           | Nature / Description   |
|---------------------------------|--|
| Topsoil                         | Approximation of quantity to be excavated Where to be stockpiled (Site Plan) How long to be stockpiled Area required for stockpile Possible reuse in rehabilitation  |
| Earthworks                      | Volume of material to be excavated Duration of earthworks operations Heights and area to be covered by excavated material stocks on site Where stocks to be kept on site (Site Plan) How long to be kept on site Where, when and how to be disposed of |
| Building material and equipment | Location of buildings / constructions, building materials and individual items of equipment (Site Plan)  Area required for material and equipment storage  Duration of construction period  Nature of material   |
| Drinking water                  | Quantity required  Duration of period in which required  Source of water  Location of potable water (Site Plan)  |

| Issue               | Nature / Description  |
|---------------------|---|
| Cooking areas       | Area required Equipment required e.g. gas stoves, matches etc. Location - must take into consideration the vegetation conditions (Site Plan)  |
| Land clearing       | How much clearing required Indication of entire area to be cleared or disturbed Indication of area to be irreversibly transformed Where to store cleared vegetation (Site Plan) How long to store cleared vegetation on site How and where cleared vegetation to be disposed of |
| Existing structures | Fences or gates to be removed or damaged Indication of which existing structures will have to be moved, removed or damaged during the construction period If structures are to be moved or reconstructed indicate the new position which is required (All on site plan)         |
| Life of project     | Working hours Time frame  |
| Construction site   | Work area required Location of construction site and work area (Site Plan) Heights of structures  |

| Issue            | Nature / Description   |
|------------------|--|
| Waste management | Litter drums - number, type, size, location (Site Plan) Closest waste disposal site (Location map) Waste management plan |

#### 2.4.3 Identification and Construction of a Suitable Access Track

Access to the construction sites is of primary importance and should be considered very early in site planning. Factors to be considered in siting the access tracks include: drainage, visibility, dust control, gradient and type of equipment that will be used during the construction and operation phase of the facility. The potential for erosion along the track must be given special attention. Access to work sites and associated infrastructure and equipment is off-limits to the public (especially children) at all times during construction.

Access tracks must be maintained in a good condition at all times during the construction phase of the estate. Poorly maintained tracks will increase the chances of soil erosion and compaction of the soil. Tracks also provide corridors for the invasion of weeds. Weed management along tracks should ensure that weed species are not introduced into new uncontaminated areas.

Vehicles should not be permitted to leave the access road, creating multiple tracks and increasing the potential for erosion. Turning of vehicles should only take place within a clearly demarcated "turn area" located adjacent to the construction site. The contractors must co-ordinate the loading and offloading of material during the

construction phase so as to ensure that vehicular movement is in one direction only at any one time and that side tracks are not created on the site.

Vehicles should only be parked alongside the construction site during the construction phase. The parking area must be located within the defined activity zone. On completion of the construction all damaged areas must be fully rehabilitated. Rehabilitation should be undertaken with indigenous material. *Cynodon dactylon* is a suitable pioneer grasses to establish on most of the degraded and damaged areas. With a cover of *Cynodon dactylon* established, natural vegetation would slowly establish itself on site. Care must be taken to remove all alien vegetation, which invades the site. A monitoring programme must be established, and the removal of alien vegetation must be included as a routine activity during the construction phase. The topsoil, which will be used in the rehabilitation, contains an abundance of seeds from alien plants and a monitoring and eradication programme must be implemented as soon as construction has been completed.

Storm water must be properly managed. Channels and drainage lines must be cut at appropriate places along any access track, which will be retained for the later maintenance of the area to ensure that storm water is diverted from the route and to minimize the potential for erosion. All cuts must be stabilized with indigenous plant material or through construction. Diffusers must be constructed at the exit points of the water.

Excess soil from excavations must not be spread on the surrounding vegetation.

#### 2.4.4 Stabilised Access Point - Location<sup>1</sup>

It is good environmental practice to designate a main entrance to the construction site. This entrance should be a stabilised access or crossover access point.

Identify the best location to place the entry / exit point. It should ideally be located in an elevated position with little or no water flowing to it from upslope and away from any down slope stormwater structures. All deliveries should be able to be made through this point. Ensure that all contractors and subcontractors are aware of its importance.

#### 2.4.4.1 The Importance of the Access

A stabilised access area allows vehicles to enter and exit the site safely during all weather conditions without either destroying valuable grass or carrying large amounts of mud and dirt on to the paved road surfaces. It provides a clean, dry surface for vehicles to enter and unload. The stabilised site access has a rough coarse surface which traps mud from vehicle tyres as they roll across it.

Mud and dirt may have significant impacts on our waterways. They smother animals and plants that live on the bottom of stream beds. They settle and make the streams shallower. Many native plants and animals cannot survive this and die.

#### 2.4.4.2 Installing the Stabilised Access Point:

The recommended construction method for stabilising the access point is laying down 200 mm of aggregate or recycled concrete greater than 40 mm in size. (Note: crushed sandstone is not suitable). Where the access area slopes toward the road, a diversion hump should be installed across the stabilised area to direct stormwater

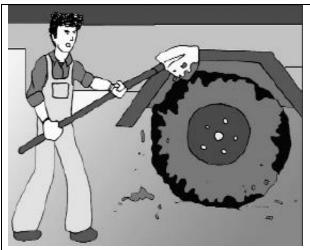
<sup>&</sup>lt;sup>1</sup> Extracted from the: 'Do it right on site' - Natural Heritage Trust and the Southern Sydney Regional Organisation of Councils – Bankstown, Botany Bay, Canterbury, Hurstville, Kogarah, Marrickville, Randwick, Rockdale, South Sydney, Sutherland Shire, Waverley and Woollahra.

run-off to the side where it can be filtered by a sediment fence. If the construction process enables it, the permanent driveway can be laid and used as the access point.

#### Maintenance of the stabilised access point:

As vehicles use the stabilised access point they will slowly compact the gravel or rock. If the access point becomes smooth it will no longer help control sediment as it is the rough surface that slows water flows and shakes off mud and dirt from tyres. It is therefore important to monitor the surface of the access point and to add new gravel or rock as needed. Roads should be inspected for any sediment that has escaped the site at the end of each day and swept if necessary. This should also be done whenever rain looks likely.

It is the responsibility of the developer / contractor to ensure that erosion and sediment control measures are in place before work commences and adequately maintained throughout construction.





Remove mud from vehicle tyres before leaving site. Care must be taken to place material away from the exit track, in an area where it cannot be washed away. Where possible, do not drive vehicles on and off site during wet weather conditions (i.e. when the site is muddy).

Inspect roads for any sediment that has been tracked off the site and sweep it back onto the site. Do not use a hose to wash away sediment.

#### **Construction notes:**

- 1. Strip at least 150 mm of topsoil, level area and stockpile in space available
- 2. Compact subgrade
- 3. Cover area with needle punched geotextile

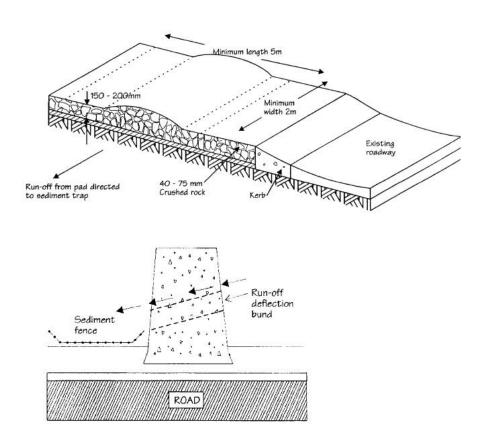


Figure 2: Construction of a stabilised Access Point (Source: 'Do it right on site' - Natural Heritage Trust and the Southern Sydney Regional Organisation of Councils – Bankstown, Botany Bay, Canterbury, Hurstville, Kogarah, Marrickville, Randwick, Rockdale, South Sydney, Sutherland Shire, Waverley and Woollahra.

- 4. Construct a 200 mm thick pad over geotextile using aggregate at least 40 mm in size. Length ideally from kerb to building footprint.
- 5. Construct diversion hump 300 mm thick immediately within boundary to divert water to a sediment fence or other sediment trap

On larger sites cattle grids may also be installed at the access point. These allow the wheels to turn a couple of times and shake off excess dirt. If mud still remains, wheels can be washed as long as the wash water does not drain to the street. It should drain to a detention area on site to allow the sediment to settle out and the water to evaporate or can be pumped into undisturbed grassed areas where it can soak into the ground.

The person delivering supplies to the site is responsible for the placement of supplies, soil / sediment they track off site and for the noise they generate. They are also responsible for replacing sediment controls they move during delivery.

#### 2.4.5 Minimising Disturbance

Environmental impacts, such as erosion caused by storm water run-off and weed invasion, increase proportionally with the increasing area of disturbance. It is very important that the total disturbed area be minimised.

Minimisation of the total disturbed area is the best method of reducing final rehabilitation costs and environmental damage. Limit the area disturbed to the minimum that is required for efficient operations. Surrounding vegetation is a valuable resource that can be needlessly destroyed by brief activities with heavy machinery and indiscriminate use of the area by humans. All site workers must be informed of the limits of the site and should be instructed not to utilise areas outside of the defined activity zone.

#### 2.4.6 Demarcation of the Limits of the Site

Prior to any construction beginning, the actual site to be worked must be clearly demarcated by means of highly visible durable tape. The "site" refers to all areas required for construction purposes i.e. buildings and infrastructure.

The boundary of the site must be agreed with the ECO. Vegetation within the demarcated zone may be cleared while vegetation outside of the zone must be left intact. This could be done in the presence of a botanist to ensure identified plant species of special concern that are to be relocated in suitable areas. Where possible, vegetation occurring inside the demarcated activity zone should be cut to ground level, leaving the roots and soil undisturbed rather than removed. This will assist in preventing soil erosion if any heavy rains fall during the construction period.

The boundary of the ecologically sensitive areas must be clearly marked and have no entry signage erected.

All construction material and machinery required for the construction of the Estate should be located within the demarcated activity zone. No activities or dumping may take place outside of the demarcated activity zone.

It is recommended that the activity zone for the project be defined and demarcated. This will prevent additional damage to undisturbed areas during the remainder of the contract.

#### 2.4.7 Construction Machinery on Site

Generators and fuel supply needed for equipment during the construction phase must be placed on drip trays, which rest on clean river sand or be done off-site. This is to prevent any oil or fuel spills. The river sand (clean or contaminated) must be removed from the site once construction has been completed. All contaminated material must be disposed of at a registered waste disposal facility. Where practical, all maintenance of equipment and vehicles on site shall be performed in a workshop. This workshop should be kept neat and clean at all times. Leaking equipment should also be serviced immediately or removed from site.

#### 2.4.8 Materials Used During Construction

No cement or concrete should be mixed on the soil surfaces or within drainage lines. Cement mixers must be placed on large trays to prevent accidental spills onto the soil surface. Where cement or concrete is mixed on the soil, contaminated soils should be removed and disposed of at a registered waste disposal site.

Fill material should preferably not be brought onto site. This is to avoid the introduction of alien vegetation and weeds. Excess soil and stone removed during the excavations should be used in site levelling. Excess material should be removed from the site and disposed of at a registered waste site. All manufactured and/or imported material shall be stored within the Contractor's camp, preferably out of the rain.

The Resident Engineer must ensure that the contractors obtain material safety data sheets (MSDS) for all materials used on site. Where applicable, all site workers must be informed of the hazardous nature of the materials being used. Hazardous chemical substances used during construction should be stored in secondary containers.

#### 2.4.9 Rehabilitation

The term 'rehabilitation' is used to encompass all of those measures, which seek to repair disturbed or degraded land, and to return such land to a stable and non-polluting state, which is suitable for the proposed future use of the land. The main aims of rehabilitation work are to:

- Achieve long-term stabilization of all disturbed areas to minimize ongoing erosion;
- Re-vegetate all disturbed areas with suitable indigenous plant species occurring on site;
- Minimize visual impact of disturbed areas; and
- # Ensure that disturbed areas are safe for future uses.

A list of plant species that can be used to re-vegetate the site follows:

#### Grasses

These grasses should be used in combination
Cynodon dactylon\*
Eragrostis curvula\*
Digitaria eriantha
Chloris virgata
Sporobolus fimbriatus

Bushes/trees
 Pioneer species:
 Plumbago auriculata
 Tecomaria capensis

Where suitable in terms of species composition

Aloe ferox
Canthium inerme
Carissa bispinosa
Portulacaria afra
Grewia robusta
Sideroxylon inerme
Ptaeroxylon obliquum
Olea europaea subsp. africana
Diospyros dichrophylla

<sup>\*</sup>these grasses work well on steep slopes

Nuxia floribunda Rhus chirindensis

#### 2.4.9.1 Site Clean Up

The first step in the rehabilitation operation is a general clean up of the total area around the works and none of these materials should be buried. Site clean up to be undertaken after cessation of the construction activities include:

- Removal and appropriate disposal of all waste materials including hazardous materials:
- Break up and removal of concrete mix residues;
- Rehabilitation of surplus tracks and turning areas, camp sites and stockpiles,
- Identification of any hazardous or contaminated materials, and weeds and their removal.
- Planting of recommended plant species (Appendix). Grasses marked with an"\*" should be planted on steep slopes in combination with the other species listed.
- Regular audits and maintenance programmes to ensure that plants are growing and serving the purpose for which they were planted (i.e. to prevent erosion).

Once the grasses are established bush species can be incorporated by the natural processes. During this process however, the encroachment of *Acacia cyclops* and other alien plants must be prevented by active removal.

#### 2.4.9.2 Non-Hazardous and Hazardous Wastes

#### **Non-Hazardous Waste**

Common non-hazardous solid wastes generated at construction sites include:

- Scrap wood (used or unused);
- Plumbing fixtures and piping;
- Dry wall;
- Insulation (non-asbestos);
- # Bricks;
- Roof coverings (e.g., shingles);
- Concrete;
- Metal scraps; and
- Plaster;
- Electrical wiring and components.
- Asphalt and Bitumen;

Before construction begins, it is important to establish who will be responsible for identifying any local and or provincial requirements (e.g., recycling standards and proper disposal of solid wastes) and who will be responsible for complying with these requirements. The use of Asphalt and Bitumen during the project life-cycle should be stored in an area approved by the Engineer as to avoid any contamination. The storage area should have a smooth impermeable floor bounded and sloped towards

a sump to contain any spillages of substances. Appropriate firefighting equipment shall be readily available on site.

If at all possible the proponent should encourage recycling or reuse of nonhazardous construction and demolition waste.

#### **Hazardous Waste**

It is important to determine if the construction project will generate (i.e. produce or have present on site) hazardous wastes.

- Ignitable (flashpoint of less than 140 degrees), such as paint thinners, paints, paint and varnish strippers, epoxy resins, adhesives, degreasers, and spent cleaning solvents.
- Corrosive (acids with a pH less than 2 or bases with a pH greater than
   12.5), such as rust removers, cleaning fluids, and battery acids.
- Reactive (explosive or violently reactive), such as cyanide, plating waste, bleaches, and waste oxidizers.
- Toxic (meeting certain concentrations), such as materials containing metals (e.g., mercury, cadmium, or lead) or solvents (e.g., carbon tetrachloride or methyl ethyl ketone). Materials may include adhesives, paints, coatings, polishes, varnishes, thinners, or treated woods.
- Batteries;
- Pesticides (as defined by the Universal Waste definition);
- Thermostats; and

#### Any other hazardous waste

When hazardous wastes are already present at the site, the contractor or subcontractor who first discovers the material is responsible for notifying the resident engineer, developer/s, and / or land owner. The local authority, the provincial authority and the Department of Water and Environmental Affairs must also be notified. Because the hazardous waste was present at the site prior to construction activities, the developer or owner typically is responsible for ensuring that the hazardous wastes are handled and disposed of properly.

When hazardous wastes are produced at the site, the contractor or subcontractor who produces the hazardous waste typically is responsible for ensuring its proper handling and disposal. NOTE: Hazardous materials stored at the site that are being used for their intended purpose are not considered "wastes" and may be stored on site indefinitely. However, once the material is no longer usable, it is considered a waste.

In terms of hazardous materials, no paint products may be disposed of on site and the use of oil based paints and chemical additives and cleaners such as thinners and turpentine shall be strictly controlled and approved by the Engineer.

#### 2.4.9.3 Site Preparation

Proper site preparation is vital to the successful stabilisation and re-vegetation of any disturbed site. The largest proportion of the cost of rehabilitation is usually incurred here. Cutting corners in this area will jeopardize the success of the entire revegetation program.

The first step in the site preparation process involves the reshaping of the area. The final land use of the site will determine the final landform. Generally, the site should be shaped so as to blend in with the surrounding landscape. Knobs and stockpiles should be levelled and waste rock / overburden pushed into hollows. The site should be left in a stable state that blends in with the surrounding area. On erodible sites, it is most important that slopes be reduced during site preparation. No vegetation removed may be burned or buried. Steep slopes between 1:3 and 1:6 i.e. steeper than 20% or 36% will generally continue to erode unless expensive stabilization measures such as pegging out of geotextiles or mulch mats to break up the slope are undertaken. Logs must be laid in continuous lines following the contours and spaced vertically, depending on the steepness of the slope. These logs must be secured by means of treated wooden pegs. Horizontal grooves, steps or ledges parallel to the contours should be used where slopes are less than 1:6. Areas of high disturbance and with a high visual impact may require special measures to rapidly ameliorate the impact.

Topsoil should be re-spread uniformly over the area at a suitable depth to support revegetation. Remember that a thin layer of topsoil is far better than none at all. Respread soil should be left with a rough surface with many suitable locations for lodgement and germination of seeds. Smooth surfaces should be ripped, or manually cultivated to improve the 'roughness' of the seedbed and provide suitable sites for lodgement and germination of seeds. Avoid spreading soil when saturated or sticky, as compaction and other damage to the soil structure will occur. Where topsoil is not available on site, alternatives must be sought - these may include subsoil or imported top soils. Extreme care should be taken when importing top soils because they often contain seeds of vigorous weeds. All compacted areas should be ripped along the contour. This may be carried out before or after spreading topsoil. Ripping will promote water infiltration and root penetration. Ripping should be carried

out when the soil is relatively dry to increase soil break-up. Ripping after soil spreading will also help to 'key' in the soil to the underlying material, and it provides a rough surface for seed application. Where soils have been spread some time before seeding, settling and formation of a hard crust may have occurred. If this is the case, the area should be ripped.

#### 2.4.9.4 Progressive Rehabilitation

Progressive rehabilitation refers to the rehabilitation of areas that are no longer required for the construction activities while the other operations continue.

Progressive rehabilitation is an important component of any development and should be implemented where feasible.

#### 2.4.9.5 Vegetation Clearing and Topsoil Stripping

Prior to site establishment the stockpile and topsoil should be stripped for subsequent use in the rehabilitation of the area. This should be done separately from the subsoil. Topsoil is usually the darker, upper soil layer. Though only 10 - 30 cm deep it contains nutrients, minerals, seed, and organic matter, which helps to bind it all together. A thin layer of topsoil is all that is needed to support a forest and protect the subsoil from erosion. The regenerative capacity of the natural soil should be protected during the construction activities. The top 20 cm of topsoil should be stripped unless otherwise stipulated by the ECO and a site for stockpiling must be approved. It is of particular importance that topsoil shall not be subject to compaction greater than 1 500 kg/m² and shall not be pushed by a bulldozer for more than 50m. Heavy machinery should also not be used to drive over the stockpiles. The stockpile height should be no greater than 2m high to minimize wind erosion. Materials such as mulch or any other suitable material could be used to cover the topsoil during extreme weather conditions. Any invasive species that may occur on the stockpiles should be removed when they germinate, to prevent contamination of the seed bank.

Vegetation being cleared may contain small amounts of seed, or provide useful fauna habitat. Logs, limbs and stumps should be cleared and stockpiled separately to the topsoil stripping operation. Smaller sized vegetative material may provide useful mulch for later use in erosion control works, or else it should be combined with the topsoil. Topsoil is a very important requirement for low cost revegetation of disturbed sites. Wherever possible, stripped topsoil should be placed directly onto an area being rehabilitated. This avoids stockpiling and double handling of the soil. Topsoil placed directly onto rehabilitation areas contains viable seed, nutrients and microbes that allow it to revegetate more rapidly than topsoil that has been in stockpile for long periods. Do not strip topsoil when saturated, as this will exacerbate the damage to the soil structure. If topsoil must be stockpiled, remember that it deteriorates in quality while stockpiled.

#### 2.4.9.6 No-Go/ sensitive area

Sensitive areas are areas that are of social, cultural or biophysical significance. This "no go" area should be demarcated with danger mesh or fenced, and that they are known to all employees. No unauthorized entry, stockpiling, dumping or storage of equipment or materials should be allowed within the demarcated "no go" areas. Other no-go areas of the remainder of the portions can be seen in Figure 3.

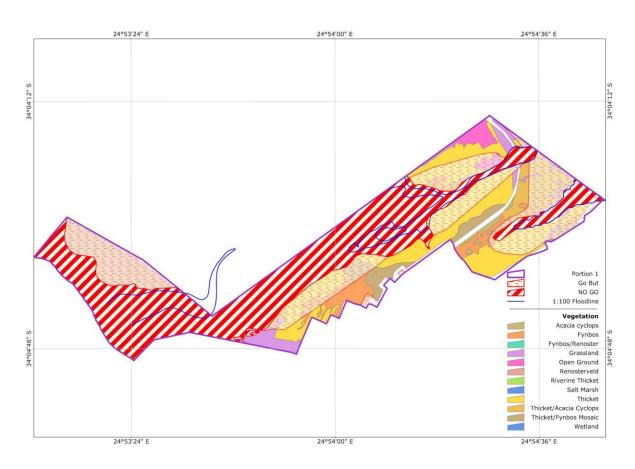


Figure 3: Areas designated as "no go" areas of the farm Swanlake no 755

#### 2.4.9.7 Control of Noxious Weeds and Pest Plants

Land clearing and disturbance provides opportunity for the invasion of exotic weeds. The construction of roads to access the construction site can also provide an avenue by which exotic species can be transported into an area. Weed invasion can be minimised by taking measures to ensure that construction operations do not introduce exotic species to an area, and also by adopting measures to manage weed

infestations at the site until such time as native species have become established after rehabilitation.

#### 2.4.9.8 Drainage and Erosion Control

Sediment derived from erosion by water, and other water borne contaminants such as diesel and oil, are often sources of pollution arising from construction activities. If environmental management is inadequate, water quality may be affected far beyond the boundary of the project.

Wherever possible, drainage works should seek to mimic natural drainage patterns and utilise natural drainage lines with retained vegetation. A cut-off drain or diversion banks above all excavation/cuts will help prevent water from entering the site and adding to erosion problems. Cut-off drains should discharge into vegetated natural drainage lines or via a level sill that distributes run-off across a stable vegetated area. Contour drains can also be used to capture and slow down water that would otherwise gather momentum as it travels down the slope. Rate of run-off increases dramatically following vegetation removal; hence the total area exposed should be kept to a minimum. Access tracks often have a major impact on water quality. Gradients should be controlled, drainage structures well maintained, and regular cross drains or culverts installed.

#### 2.4.9.9 Erosion Prevention

Erosion will continue long after construction activities have ceased unless preventative measures are implemented. Poor drainage management can lead to damage or destruction of the rehabilitation investment. The best erosion prevention at a site is the establishment of vegetation. However, while vegetation is becoming established, it may be necessary to employ other erosion prevention techniques.

It is generally wise to retain any existing drainage controls, such as contour banks, rock filters and cut-off drains, upslope of the area being rehabilitated, to slow down surface run-off. A rough surface will capture more water and allow rainfall to infiltrate rather than flow directly downhill. Artificial structures should be removed once the site is fully rehabilitated.

#### 2.4.9.10 Re-vegetation

Establishment of a self-sustaining cover of vegetation is the best low maintenance stabilizer of disturbed sites in the long term. Re-vegetation also minimizes the impact of visual intrusion. Generally, the vegetation type, which existed before the disturbance, or a similar vegetation type will be most successful afterwards, following an initial re-establishment period. Re-vegetation will be considerably easier to achieve where site preparation has been done well.

The objectives of re-vegetation should be; to re-establish a native vegetation cover, which is similar in species composition to that, which existed before the disturbance and to prevent erosion on the site; and manage adverse visual impacts from critical viewpoints.

A number of species of special concern (SSC) were identified during the site visit and included (CES, 2009):

- Sideroxylon inerme L
- \* Aloe africana Mill
- # Haworthia gracilis V.Poelln. var. isabellae (V.Poelln.).
- \* Pelargonium reniforme var. Indet

- \* Strelitzia nicolai
- \* Crassula perfoliata subsp. Indet.
- Mesembryanthemaceae family

Vegetation occurring on-site and subject to removal includes mainly Renosterveld, Fynbos, Grasses and thicket species (Figure 4).

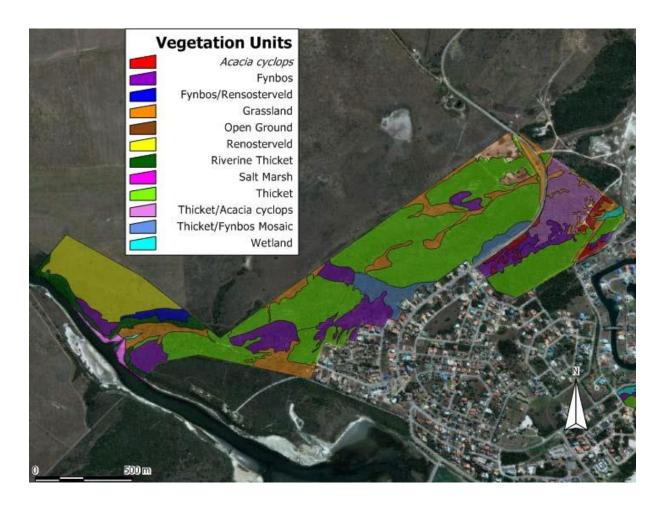


Figure 4: Vegetation units (Vlok & Euston-Brown, 2002) occurring throughout the remainder of the site

#### 2.4.10 Waste Disposal and Storage of Chemicals

Construction works of the size and nature of the proposed development can generate a substantial amount of litter and rubbish. All rubbish, litter, equipment, temporary structures, and waste material must be removed on a progressive basis from the site and recycled wherever possible, or disposed of at a registered waste disposal site as stipulated by DWS, unless otherwise approved in writing. No on site burying or dumping should be allowed. A recycling program should be implemented and bins with lids placed in various positions of the site and should be removed at least once a week. Hazardous materials must only be disposed of at an approved hazardous waste disposal facility.

#### 2.4.11 Health and Safety Matters

Adequate chemical toilet facilities must be erected and maintained in good order on the site for the duration of the construction phase. Toilets should be removed from site when construction is completed. Waste must be disposed of at a registered waste site. Washing, whether for personal hygiene or of personal effects and acts of excretion and urination are strictly prohibited; other than at the facilities provided. No sanitation facilities may be located closer than 50m from any water body.

Adequate clean drinking water must be available to construction staff at all times during the construction period. An area must be demarcated for staff to conduct all necessary cooking activities and bins with lids should be readily available. The site must be selected to ensure that there is no risk of fires. It would be advisable to ensure that small gas cookers are available on site. Eating outside of these designated areas is prohibited. No wild animals may be fed on site.

| Work crews should preferably not be housed on site and where feasible should be accommodated in suitable residential areas in close proximity to the construction site. |
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# Chapter

## Suggested Organization Structure

#### **Chapter 3: Organizational Requirements**

#### 3.1 Introduction

The contractor and their appointed Project Managers is required to be familiar with the environmental objectives and policy and all it implies and must ensure that this policy is adopted and implemented throughout the development process.

#### 3.2 Background to Environmental Policy

An environmental policy is a statement of the environmental values of an organization. It conveys these environmental values to employees, demonstrates to stakeholders the importance that senior management attaches to environmental

protection and management, and provides a guiding framework for conducting the organization's business in an environmentally compatible manner.

The philosophy behind the Environmental Management Programme is for it to become an effective means of managing environmental performance by:

- Enabling the identification of critical environmental issues:
- Developing action plans and setting targets;
- Ensuring environmental performance;
- Raising environmental awareness among management, staff and the community which it serves; and,
- Providing appropriate training.

The purpose of the Environmental Management Programme is to translate environmental policy into practice by putting in place workable systems, structures and tools to achieve integrated and consistent environmental management of all environmental initiatives.

This environmental management plan suggests certain detailed objectives, which it believes, are applicable to the construction of a residential eco-estate. It is important that the developer and their project managers review these detailed policies and if in agreement, adopt them as firm policy.

#### 3.3 Arctismart (Pty) Ltd Policy (Suggested)

#### The environmental policy is as follows:

- The environmental specifications and intentions of the specifications must be upheld.
- Natural resources will not be degraded, and no unnecessary environmental degradation must take place.
- Site activities will be conducted in a manner that does not create a nuisance, risk or hazard to the natural environment.
- > Employee and public health and safety must be considered a priority.
- > The whole site and its surrounds are considered environmentally sensitive.

#### 3.4 Organizational Overview

All "managers" involved in the construction of the Estate should be obliged to familiarize themselves with Arctismart (Pty) Ltd.'s stated environmental policies. Managers should be familiar with the requirements of the Environmental Management Plan and should execute all construction, decommissioning and maintenance activities in an environmentally responsible manner.

This overview offers a perspective of the proposed organization of the Environmental Management Plan and the recommended responsibilities of key members of the project team, as represented on the organogram (Figure 5).

Ultimate responsibility and public accountability for the Environmental Management Plan and the general environmental management during the construction phase resides with the developer/s.

The contractors are responsible for implementing and managing the Environmental Management Plan. (It is recommended that the contractors nominate a member of their team as an Environmental Control Officer who is responsible for ensuring that the requirements of the Environmental Management Plan are implemented on a day to day basis. The Environmental Control Officer should be present on site at all times). The contractors report to the Resident Engineer or his representative regarding compliance with the conditions as stipulated in the Environmental Management Plan. The Resident Engineer or his representative works through the Site Environmental Control Officer to assist with day-to-day environmental management.

A Site Environmental Control Officer is appointed by the Developer (through the Resident Engineer or his representative) to assist and provide advice on the implementation of the Environmental Management Plan.

Where procedures in the Environmental Management Plan and methods delineated in the Method Statements are persistently transgressed and appropriate corrective action is not implemented, the Site Environmental Control Officer through the Resident Engineer or his representative may order the suspension of related activities or impose a fine on the transgressor.

Regular meetings should be held to ensure that the Environmental Management Plan is effectively implemented.

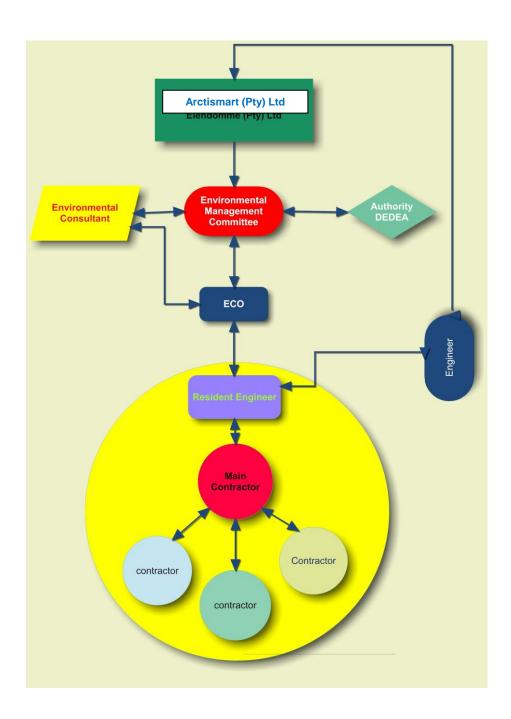


Figure 5: A Possible Organisational Structure for the Environmental Management of the Construction Phase of the Estate

### 3.5 Roles and Responsibilities for the Implementation of the Environmental Management Plan

This section defines the roles of the key parties involved in the implementation of the Environmental Management Plan for the development and mitigation measures suggested in the Scoping Report relevant to the development.

#### 3.5.1 The Developers

Arctismart (Pty) Ltd and the associated developers, as the project initiators, have the overall accountability and responsibility for environmental management during the design, construction and operational phases of the development. Further it is their responsibility to ensure that the conditions of the Environmental Authorization and mitigation measures suggested in the Environmental Impact Report are communicated to, implemented and complied with by the project managers, contractors and sub-contractors.

While it is the responsibility of the contractors and the sub-contractors to prepare and implement the detailed Method Statements, Arctismart (Pty) Ltd will remain accountable for their implementation.

Arctismart (Pty) Ltd and the associated developers (and not the Project Manager, Resident Engineer or the contractors) will be responsible for liaison with the relevant authorities with respect to the implementation of the Environmental Authorization and the Construction Environmental Management Plan.

With respect to the Environmental Management Plan for the construction phase, Glenny Buchner Trust and developers is responsible for:

- Liaising with the project engineer, architects and builders, to ensure that all components of the facility are designed to meet all the listed environmental conditions as well as all of the legal requirements.
- Reviewing the Method Statements prepared by project engineers, the contractors and sub-contractors for specific activities relating to the construction phase.
- Reviewing and approving management plans prepared by the project engineers, contractors and sub-contractors.
- \* Reviewing and approving any environmental monitoring programmes that are recommended by the environmental consultant, the site environmental control officer or the authorities.
- Advising on actions to be taken in the event of incidents or public complaints.
- \* Providing the results of environmental reports to the relevant authority
- Ensuring that the required audits are undertaken on a timely basis and that the results of the audits are communicated to all operation personnel.

#### 3.5.2 Authorities

The authorities are responsible for the timely processing and issuing of the necessary permits and authorizations for the construction and operation of the Eco-Estate and associated infrastructure. The authorities will ensure that the developers comply with the terms that are stipulated within the Environmental Authorization.

Where necessary, the authorities will assist Arctismart (Pty) Ltd and the associated developers in understanding and meeting the specified requirements.

The authorities may perform random controls to ensure compliance with the conditions. In such case, the developers will assist the authorities in every possible way so as to facilitate the control. In case of long-term non-compliance, Arctismart (Pty) Ltd will be required to provide an action plan with corrective measures for approval by the authorities.

#### 3.5.3 Responsibilities: Resident Engineer

All obligations relevant to the developers concerning the implementation of the Environmental Management Plan, will apply to the Resident Engineer or his representative, contractors and sub -contractors associated with the construction phase of the development. Arctismart (Pty) Ltd and associated developers will inform the Resident Engineer or his representative of these obligations, as well as of the Method Statements required in terms of these obligations, and will control their implementation. The Resident Engineer or his representative is to convey the requirements of the Environmental Management Plan to the contractors and their sub-contractors; and ensure that they comply with these obligations.

It is the responsibility of the project engineers, contractors and sub-contractors to prepare and implement Method Statements which detail the means they will employ in order to meet the objectives set in the Construction Environmental Management Plan.

The contractors and sub-contractors will be required, where specified, to provide Method Statements to the Resident Engineer or his representative setting out in detail how the management actions will be implemented in order to ensure that the environmental management objectives will be achieved. The method statements of different sub-contractors will be consolidated by the Resident Engineer or his representative into a Management Plan for a particular component of the Construction Environmental Management Plan. These Management Plans must be reviewed and approved by Arctismart (Pty) Ltd and developers prior to the commencement of the relevant construction activity.

The Resident Engineer shall through the developers appoint a Site Environmental Control Officer (or officers, if more than one is required), whose primary role shall be to coordinate the environmental management activities during the construction phase of the development.

The Resident Engineer or his representative working in close cooperation with the Site Environmental Control Officer ensures that the Environmental Management Plan is implemented. The Resident Engineer or his representative is the direct link between the Site Environmental Control Officer and the Contractors and subcontractors. Specific responsibilities include:

- Distribution of copies of the Environmental Management Plan to the project team
- Advising the developer on the appointment of any specialist if required
- Attending Project Progress Meetings, where the performance of the Environmental Management Plan is discussed and / or reviewed.
- Commission of monitoring programme recommended by the Site Environmental Control Officer

- Briefing the contractors regarding their Environmental Management Plan responsibilities and ensure that they implement the conditions of the Environmental Management Plan
- Formalizing systems and delegating authority to ensure that the Environmental Management Plan is effectively implemented
- Regular site inspections and monitoring to ensure compliance with the prescribed procedures in the Environmental Management Plan
- Devising a Corrective Action Procedure for implementing corrective and preventive action
- Regular consultation with the Site Environmental Control Officer, as appropriate
- Facilitating the implementation of a general and specific environmental awareness training programme
- Devising a system to evaluate the training programme regularly and recommend changes as required
- The creation, in consultation with the Site Environmental Control Officer, of a Method Statement pro-forma, for distribution to the appropriate contractors and their sub-contractors
- \* The examination, revision and approval, of contractors Method Statements
- Keeping records of waste disposal, audits, inspections, monitoring and corrective actions

- Ensuring that copies of the Environmental Management Plan are available to all contractors and sub-contractors
- Identification of any new significant environmental impacts and their associated aspects, and the necessary environmental management requirements to manage them and minimize them
- Organizing regular internal audits on the implementation of the Environmental Management Plan
- Ensuring necessary environmental authorizations and permits have been obtained.
- Monitoring and verifying that the CEMP is adhered to at all times and taking action if the specifications are not followed.
- Keeping records of all activities/ incidents on Site in the Site Diary concerning the environment.
- Keeping a register of complaints in the Site Office and recording and dealing with any community comments or issues.
- Issuing of penalties for transgressions of site rules.

#### 3.5.4 Responsibilities: Contractors and Sub-Contractors

The Contractor/s and sub-contractors have final responsibility and are accountable to the Developer for the effective implementation and monitoring of the Environmental Management Plan.

The contractor and sub-contractors are responsible to the Resident Engineer or his representative for the effective implementation of the Environmental Management Plan within their respective line functions. Specific responsibilities include:

- The full implementation of all of the requirements of the Environmental Management Plan in terms of the approved method statements.
- Ensuring that all sub-contractors are familiar with and adhere to the
   Environmental Management Plan and the environmental code of conduct
- Identifying procedures applicable to the activities they perform and / or control
- Identifying, in consultation with the Resident Engineer or his representative which sub-contractors are responsible for compiling (which) method statements
- Compiling method statements to meet the procedures and targets
- Submitting method statements to the Resident Engineer or his representative for approval
- Devising a system for monitoring compliance with method statements and procedures
- Identifying environmental training needs and implementing the environmental awareness training programme commissioned by the Resident Engineer or his representative
- Implementing corrective and preventive actions recommended by the Resident Engineer or his representative

- Reviewing of the Environmental Management Plan implementation and effectiveness at site meetings with the Resident Engineer or his representative and the Site Environmental Control Officer
- Ensuring regular internal auditing of the implementation of the Environmental Management Plan.
- Maintaining and submitting records of waste disposal activities and corrective actions taken to rectify environmental problems on site.
- Attending Environmental Management Plan monitoring meetings with the Resident Engineer or his representative

#### 3.5.5 Responsibilities: Site Environmental Control Officer

A Site Environmental Control Officer with appropriate environmental and construction experience must be appointed by the Project Manager or Resident Engineer (through Arctismart (Pty) Ltd) to advise and assist the Resident Engineer or his representative and project team where necessary and to monitor the implementation of the Environmental Management Plan. The Site Environmental Control Officer reports to the developer through the Resident Engineer or his representative and or depending on circumstances to the Independent Environmental Consultant appointed by Arctismart (Pty) Ltd and associated developers.

It is the responsibility of the Site control officer:

To raise the awareness of the contractor and sub-contractors and their staff to the environmental sensitivity of the project area and to foster an appropriate environmental attitude during the contract period.

- Supporting and advising the Resident Engineer or his representative, especially as regards review of Method Statements, auditing, monitoring and corrective and preventive action
- Accompanying the Resident Engineer or his representative on site inspections at a frequency determined by the developer, the Resident Engineer or his representative and the Environmental Consultant
- Recommending environmentally appropriate solutions to environmental problems
- Recommending additional environmental management measures as appropriate
- Attending pre-construction and Project Progress Meetings, as necessary or on a basis determined by the developer and the Resident Engineer or his representative
- All non-compliances will be recorded in the Environmental Auditing Checklist and a report detailing these non-compliances must be compiled and submitted to the Project Manager within 24 hours
- Ensure that any disturbance due to construction has been cleared and rehabilitated by the Contractor as specified in the CEMP.

#### 3.5.6 Responsibilities: Environmental Consultant

The project proponent [Glenny Buchner Trust] will retained the services of an Independent Environmental Consultant during the construction phase of the development. The role and function of the independent environmental consultant is to:

- Assist the developer/s in ensuring that the conditions of the Environmental Authorization and mitigation measures in the Environmental Impact Report are adhered to
- Undertake periodic independent environmental audits on a time frame to be agreed to between the developer and the consultant
- Assist in liaison with Interested and Affected Parties and other stakeholders in the project
- Assist in the review and compilation of method statements to cover the various aspects of the work to be undertaken on site
- Assist the Site Environmental Control Officer in his day to day functions when necessary
- Review audits undertaken by the Site Environmental Control Officer
- Assist with environmental monitoring programmes established to ensure that a high level of conservation is attained on the development site
- Attend site and other meetings as decided upon by the development proponent and the consultant

#### 3.6 Method Statements

The appropriate contractors must submit Method Statements to the Resident Engineer or his representative and Site Environmental Control Officer outlining proposed construction activities, phasing and procedures and methods to comply with the targets stipulated in this Environmental Management Plan. Method Statements should, where applicable, include Construction procedures, Site

Establishment Drawings and Plans with sufficient detail to assess the potential impact of the site facilities or to assess the degree of safeguarding provided against pollution and other impacts, Materials and equipment to be used and how these will be transported to and from the site as well as how materials will be stored.

Method Statements indicate how the procedures will be applied in order to meet the relevant targets and are central to the proper implementation of the Environmental Management Plan. It is anticipated that in addition to assessing the systems and performance of the Environmental Management Plan, the Site Environmental Control Officer will scrutinize the formulation of, and adherence to "Method Statements" in some detail.

Method Statements must be submitted before any work on the project is undertaken. The various method statements must be approved by the Resident Engineer or his representative (in consultation with the Site Environmental Control Officer). The Resident Engineer or his representative must keep copies of these Method Statements and letters of approval (including conditions attached) in a Method Statements file.

The Resident Engineer or his representative (and the Site Environmental Control Officer) must approve any deviations from the approved Method Statements.

All amendments must be in writing and must be submitted to the Resident Engineer or his representative.

Method statements should be submitted to the Environmental Consultant for comment before final approval is issued.

#### 3.7 Meetings

It is anticipated that Progress Meetings, attended by the Resident Engineer or his representative and other members of the project team will be held on a regular basis. It is recommended that a minimum of one meeting every month be held where the Environmental Management Plan can be discussed. The discussions on the Environmental Management Plan must continue for the life of the construction of the facility with the last meeting being held two months after construction has been terminated. This final meeting should be preceded by a final site audit by the environmental consultant. The audit will be presented at this final meeting.

The Resident Engineer or his representative may call for additional meetings in response to particular environmental problems.

The Site Environmental Control Officer will attend progress meetings if requested to do so by the Resident Engineer or his representative. The Site Environmental Control Officer shall decide whether other specialists (archaeologist, landscape architect, restoration ecologist etc.) need to attend various meetings or not.

At each of the meetings contractors will report performance against their defined Environmental Management Plan objectives and targets.

Chapter

# **Environmental Management Plan Requirements**

## Chapter 4: Environmental Management Plan Requirements

#### 4.1 Introduction

The Environmental Management Requirements are designed to address the legislation as well as the issues and impacts raised through the environmental assessment as they relate to the construction phase of the proposed Eco-Estate and associated infrastructure. Each of the Environmental Management Requirements is presented as follows:

- Objective: potentially significant impacts to be mitigated.
- Aspects: activities likely to cause significant impacts; this list is not exhaustive and other unspecified activities might also cause the respective significant impacts.
- Procedure: steps and/or actions required to manage (and minimize) the relevant aspects.
- \* Target: the (quantitative) level of performance, sometimes determined by legislation, which must be met.

Applicable environmental legislation is listed as one of the Environmental Management Requirements in the Environmental Management Plan. However, the list provided is not exhaustive and it is the responsibility of the Resident Engineer or his representative and the contractors to ensure compliance with all environmental (and other) legislation.

#### 4.2 General Conditions and Prerequisites for Construction Activities

The following section identifies the management actions relevant to both the construction and operations phase that must be completed prior to the commencement of construction activities.

#### **Objective:**

To ensure that all conditions and requirements of the Environmental Authorization and the Construction EMP stipulated as pre-requisites for construction are met.

#### **Aspect**

 Actions to be completed by Arctismart (Pty) Ltd prior to the commencement of the relevant construction activity

#### **Procedure**

Review the full Environmental Authorization and convey the outstanding actions to the responsible team member.

#### **Targets**

Ensure that all requirements of the Environmental Authorization are in place and that any approval is obtained in writing prior to commencing any construction activities

#### 4.3 Legislation

The following list of environmental legislation applies to the construction phases of the Aston Bay Eco-Estate and associated infrastructure. A full review of the legislation relevant to the project is presented in the environmental assessment and the list presented here is not necessarily exhaustive. Ultimately, the Resident Engineer or his representative and the contractors are responsible for ensuring identification of and compliance with all appropriate legislation at the national, provincial and local level.

## > Table 1: Major Legislation Applicable to the Construction of the Eco-Residential Development

| Issue  | Legislation  | Authority                                    |
|--|--|--|
| Proper zoning of land use  | Land Use Planning Ordinance<br>15 of 1985<br>National Agricultural Act (Act 70<br>of 1970) | Local Authority / District<br>Municipalities |
| Use of public water  Discharging waste or water containing waste into a water body | National Water Act (Act 36 of 1998)  | DWS  |
| Air quality and dust generation  | Air Quality Act (Act 39 of 2004)   | DEA  |
| Worker health and safety   | Occupational Health and Safety<br>Act, 1993 (Act 85 of 1993)                               | Dept Labour                                  |
| A socially responsible workforce   | Labour Relations Act, 1995 (Act 66 of 1995)  | Dept Labour                                  |
| Preservation of archaeological and cultural artefacts                              | National Heritage Act, (Act 25 of 1999)  | National Heritage Council                    |
| Waste disposal   | National Environmental  Management: Waste Act (Act 59 of 2008)                             | DEDEA, DEA, DWS                              |

| Issue   | Legislation   | Authority                  |
|---|---|----------------------------|
| Noise   | Environment Conservation Act<br>1989 (Act 73 of 1989) Sec 25  | DEA                        |
| Protected fauna and flora   | Eastern Cape Provincial Nature Conservation Ordinance of 1974 National Environmental Management: Biodiversity Act (Act No 10 of 2004) | DEDEA, DWS, DAFF           |
| Protected Trees (Permit required from Department of Forestry)       | Forest Act of 1984 (Act 122 of<br>1984)<br>National Environmental<br>Management: Biodiversity Act<br>(Act No 10 of 2004)              | DWS, DAFF, DEDEA           |
| Agricultural resources  | Conservation of Agricultural Resources Act (Act No 73 of 1983)  | DAFF                       |
| Proclaimed Mountain Catchment<br>Areas                              | Mountain Catchment Areas Act (Act 63 of 1970)   | DWS                        |
| Health issues   | Health Act (Act 63 of 1977)   | Health                     |
| Quarry related activities and<br>Environmental Management<br>Plan's | Mineral Act (Act 50 of 1991)<br>Sections 38 and 39  | Mineral and Energy Affairs |
| Toxic and hazardous substances Fuel storage                         | Hazardous Substances Act (Act<br>15 of 1973)<br>National Environmental<br>Management: Waste Act (Act 59<br>of 2008)                   | Health DWS / DEDEA         |
| Fencing   | Fencing Act (Act 31 of 1963)  | DAFF                       |

| Issue                          | Legislation                                      | Authority |
|--------------------------------|--|-----------|
| Pests                          | Agricultural Pests Act (Act 36 of 1983)          | DAFF      |
| Nature Conservation Ordinance  | Justice and Provincial Government                | DEDEA     |
| Reconstruction and development | Development Facilitation Act<br>(Act 67 of 1995) | Various   |
| Borrow pits                    | Minerals Act (Act 50 of 1991)                    | DMR       |

| Agriculture, Forestry and Fisheries                          | DAFF  |
|--|-------|
| Department of Economic Development and Environmental Affairs | DEDEA |
| Environmental Affairs  | DEA   |
| Justice & Constitutional Development                         | DJCD  |
| Mineral Resources  | DMR   |
| Water Affairs  | DWS   |

It is recommended that the Resident Engineer or his representative and / or the Contractors obtain copies of all relevant legislation. An updated file of all legislation should be maintained at the Resident Engineer or his representative's office.

Other applicable legislation that should be included is:

- Constitution of the Republic of South Africa Act No. 108 of 1996.
- National Environmental Management: Integrated Coastal Management Act
   No 24 of 2008
- White Paper for Sustainable Coastal Development in South Africa, April
   2000

#### 4.4 Environmental Management Requirements

This section presents the environmental requirements for the construction and decommissioning of the Estate and associated infrastructure. The requirements are worded in broad terms and details of the actions to be undertaken must be presented in the Method Statement for each aspect. Method statements are compiled by the contractors or their sub-contractors and approved by the Resident Engineer or his representative and the Site Environmental Control Officer. All method statements are to be reviewed by the Independent Environmental Consultant.

#### 4.4.1 Basic Planning

#### **Authorisation**

- 8.2.1. The layout presented In Figure 6.3 of the document titled Addendum Environmental Report to the Final Scoping Report of November 2001• and dated January 2009, to be amended and submitted to this Department for approval prior to any construction commencing on site (inclusive of the installation of service infrastructure).
- 8.2.2. The amended layout plan to provide for amongst others the following:8.2.2.1. No development inclusive of service infrastructure, is to be located in any areas where the vegetation has been identified as being of very high sensitivity;

8.2.2.2. No erven ere to be located in any of the areas where the vegetation has been identified as of high sensitivity as depicted In Figure 4.2 on Page 17 of the document titled "Addendum Environmental Report to the Final Scoping Report of November 2007" and dated January 2009 and only individual footprints representing free standing units (hereafter referred to as free standing footprints") with a maximum size of 400m² are to be considered for placement in these areas: 8.2.2.3. Concomitant to Condition 8.3.2.2, the placement of free standing footprints in any of the areas where the vegetation has been identified as of high sensitivity, to be done in such a manner that the length of access roads are minimised; 8.2.2.4. No other Infrastructure, Inclusive of the proposed playparks, are to be located within any of the areas where the vegetation has been identified as of high sensitivity;

- 8.2.2.6. The total number of units to be accommodated on the various portions of land not to exceed the total number of units presented in Figure 6.3 being 393;
- 8.2.2.7. The exact location of free standing footprints on the various portions of land inclusive of coordinates;
- 8.2.2.8. The exact location of ell other components of the development inclusive of access roads (also access roads to individual units), entrance gates and other service infrastructure; and
- 8.2.2.9. No Infringement / encroachment of development into the ecological zones as depicted in Figure 6.3.<sup>2</sup>

Conditions Specific to the Construction of Service Infrastructure and the Residential Components of the Residential Estate.

8.7.1. The Construction Environmental Management Plan (CEMP), submitted in the Addendum Environmental Report to the Final Scoping Report of November 2007

Draft Environmental Management Plan for the subdivision and rezoning of the Remainder Swanlake Farm No 755

<sup>&</sup>lt;sup>2</sup> The figures in the clauses extracted from the authorisation refer to figures in the document titled Addendum Environmental Report to the Final Scoping Report of November 2007 dated January 2009.

dated January 2009 to be implemented for the construction phase of the project. The CEMP and associated specifications must be amended to include amongst others:

- 8. 7.1.1. Clarification of the acronym CEAP;
- 8. 7.1 .2. Applicable conditions as contained In this Record of Decision;
- 8.7.1 .3. General principles of environmental management as-applicable to construction activities including environmental best practice, soil erosion control, minimisation of dust, etc.
- 8. 7 .1.4. A waste management plan to address waste disposal and management, inclusive of building waste I rubble, during the construction phase;
- 8. 7.1.5. Clear stipulations as to who Is responsible and accountable for what actions; and
- 8.7.1.6. A general code of conduct for any contractor that might be carrying out any work on the development site.
- 8.7.2. General principles of environmental management as provided for In Condition
- 8.7.1.3 to provide for amongst others, the following:
- 8.7.2.1. Generators end fuel supply needed during construction must be placed on trays. which rest on clean sand. Once construction has been completed, this sand must be removed from site and disposed of at a registered waste disposal site.
- 8.7.2.2. Cleared areas and excavated material generated during construction must be dampened to minimise dust until such time that this material has been utilised during the rehabilitation process or that it can be removed and disposed.
- 7.2.3. No cement/ concrete mixing to take place on the soil surface. Cement mixers to be placed on large trays to prevent accidental spills from coming into contact with the soil surface.
- 8.7.2.4. No fill material to be brought on site. Excess material remaining after construction, to be removed from the site end disposed of at a registered waste disposal site.

8.7.2.5. Any substrate contaminated by the spillage of hydrocarbons or other pollutants to be removed from site and disposed of at an appropriately registered waste disposal site.

8.7.2.6. No waste from construction or otherwise, may be disposed of on site. All waste generated on site, to be removed from site and disposed of at a registered waste disposal site. In this regard adequate litter drums or other suitable containers must be located on site to ensure that waste generated on site Is disposed of in a suitable and timeous manner. Containers must be such that dogs and other scavengers cannot gain access thereto.

## **Objective**

To plan the site of the construction together with access routes and associated work areas to allow for sound environmental management and an effective rehabilitation of the total site.

#### **Aspect**

All activities related to the construction of the Estate.

- Compile an annotated base plan / map of the site indicating the various activity zones, roads and tracks, all stockpile areas, campsites and all other areas which will be used or altered during the construction phase.
- Indicate details of the access and internal roads and track
- Clearly Indicate all "no go" exclusion areas
- Note the location of registered waste disposal sites
- Locate a stockpile site

Show where the site office will be located

#### **Targets**

 Approved site plan before commencing with the construction of the Estate and associated infrastructure

## 4.4.2 Restriction of Working Areas

#### **Objective**

To restrict access to the site in order to reduce the potential for accidents, dust generation, water pollution, fires, and environmental damage to flora, fauna and other sensitive environmental elements. To keep the demarcated and /or fenced off work area as small as possible.

To restrict access to all environmentally sensitive areas.

#### **Aspects**

The effective demarcation of the construction site, the minimizing of traffic on the access and internal roads, and the control of vehicles entering the site.

- The demarcated area must cover as small an area as possible. This will prevent the unnecessary trampling of vegetation during the construction, operational, and maintenance phases. It will also result in a smaller area requiring rehabilitation.
- Once the demarcated area has been approved a written motivation to alter the boundary must be submitted to the Resident Engineer or his representative for consideration and (possible) approval.

- The markings of the site must be maintained throughout the construction period, as and where determined by the Resident Engineer or his representative. This is to ensure that unnecessary damage is not done to the surrounding areas. It will also ensure the safety of people working on site and people moving in the vicinity of the site.
- A comprehensive set of photographs should be taken of the site prior to commencing any construction.
- At the end of construction activities all components of the marking system (tape and poles) must be removed, to the satisfaction of the Resident Engineer or his representative.
- Post construction photographs should be taken as a comparison with the preconstruction photographs and the ECO should make an assessment of the environmental damage.
- The speed of the traffic on the access roads needs to be kept slow to curb any unnecessary dust.
- Vehicles must be instructed to remain on the track and deviations from the approved track must not be permitted. In exceptional circumstances where a vehicle is forced to deviate from an approved track the deviation must be rehabilitated immediately after such an event. All deviations must be reported to the Resident Engineer or his representative.
- Production of an Area Restriction Method Statement which includes the access road

#### **Targets**

Approved Area Restriction Method Statement.

- Controlled access to the site for the contractors, work crews, subcontractors
- Prohibited access to the public, with adequate sign posting.

#### 4.4.3 Flora and Fauna

#### **Objective**

To minimize damage to indigenous flora and fauna utilizing the construction site and the surrounding areas. To ensure the protection of the areas identified as sensitive and worth of conservation. To re-vegetate the area as necessary to alleviate erosion potential and to improve any aesthetic issues. To ensure minimum disturbance to indigenous flora and fauna occupying the area influenced by the construction.

#### **Conditions of Authorisation**

The original authorisation issued for the development states that:

- 8. 7.18. Prior to project implementation a once over botanical survey must be carried out by a botanical specialist, to establish whether any species which are of special concern or protected in terms of the Nature and Environmental Conservation Ordinance, Ordinance 19 of 197 4, or in terms of the National Forests Act, Act 84 of 1998 occur on the areas of the site earmarked for development.
- 8. 7.19. Specimens Identified In terms of Condition 8.8.18, as well as other indigenous plant specimens which can be relocated, are to be rescued in consultation with the above botanical specialist before vegetation clearing takes piece. Such specimens are to be appropriately transplanted, including in rehabilitation Initiatives, where applicable and practicable.
- 8.7.20 states a that all the necessary permits must be obtained prior to commencing construction

Condition 8.7.18 could not be fully implemented. While a botanist was appointed to conduct the survey, he was unable to survey the site as required due to the impenetrable nature of the vegetation.

Dr David J. McDonald Pr. Sci. Nat. of Bergwind Botanical Surveys & Tours CC reported to the planner as follows:

"The vegetation found at the site is Gamtoos Thicket that is extremely thorny and in many places completely impenetrable. This is a Least Threatened vegetation type, BUT it contains milkwood trees (*Sideroxylon inerme*) a protected species and for which a permit is required for cutting or removal. I also found one cheesewood tree (*Pittosporum viridiflorum*) that is also protected. The problem is that the milkwoods are scattered throughout the site but more so towards the east. It is consequently VERY difficult to map them as individual or clusters. The main problem is access to the trees. I spent the morning on Wednesday battling through the western section of the site and then tackled the eastern section that is so dense that the best that I could do was to walk around the boundary and try to get a fix on the milkwood trees. It was not accurate, but I can verify that there are a lot of milkwoods and it would be a substantial loss for them to be removed. There is one group (grove) at waypoint SLA19 (see Google Earth KMZ file) that is very old, covering an estimated 30 x 50 m that I would like to see preserved.

There are also numerous alien invasive Acacia cyclops (rooikrans) that have tended to degrade certain parts of the site.

I have mapped the site as best as I can, but it is virtually impossible to give a clear indication where the milkwoods are since they are scattered and not

concentrated in one particular area. I have therefore made a recommendation of where I think development would have the least impact (pink areas). However, the latter two areas are not large and there is some scope for relaxing this proposed development zone. The only way that this site can be developed is if the vegetation including milkwoods is removed. There is likely to be some considerable resistance to the loss of the milkwoods from the Department of Agriculture, Forestry and Fisheries that would have to issue a permit for their removal." See Figure 6.

#### **Aspects**

Areas to be cleared for construction, areas to be re-vegetated; lighting of fires and provision of services.

- Obtain the necessary permits from the Department of Agriculture, Forestry and Fisheries
- The areas should be cleared of all alien vegetation prior to commencing construction. The site should then be resurveyed to locate the protected species.
- Gathering of firewood on or adjacent to the sites should not be permitted unless the woody material is from alien plants and the developer is certain that the removal of the firewood from the site will not allow for the spread of seeds.
- The Conservation of Agricultural Resources Act (Act 43 of 1983) states that no person shall dispense any weed in the country. In accordance with the Act every effort must be made to ensure that the site and other clearly

marked areas relating to the operation and decommissioning is kept free of weeds or invasive plants.

\* A Flora and Fauna Method Statement incorporating the above procedures and the site maintenance plan, including timing and physical boundaries, must be submitted by the appropriate contractors to the Resident Engineer or his representative for approval.





> Figure 6: Area as mapped by Dr D McDonald during September 2017 with the Proposed revised layout below.

- All cleared areas adjacent to the work area should be re-vegetated and maintained to control erosion and minimize dust.
- All the areas cleared must be suitably rehabilitated with suitable indigenous and endemic vegetation upon completion of the construction works.
- Fires are to be prohibited on and adjacent to the site, during the construction phase.

#### **Targets**

- Approved Flora and Fauna Method Statement.
- Approved Rehabilitation Plan and Method Statement
- All vertebrate species encountered must be flushed from the demarcated areas immediately prior to beginning with construction work.
- Site workers may not kill any animals found on the site.
- No fires are permitted on or close to vegetated areas.

#### 4.4.4 Cultural Historic, Archaeological and Paleontological

#### **Authorisation**

8.7.21. Any recommendations made by the South African Heritage Resources Agency (SAHRA) in response to the Heritage Specialists findings must be incorporated into the CEMP.

8.7.22. Adequate preventive measures must be undertaken to avoid danger to or destruction of any archaeological sites end other resources during development of the site. This must include inspection of each Individual construction site by an archaeologist prior lo construction activities commencing on that site.

8.7,23. In the event of any potential archaeological site being encountered all work on site will cease end a qualified archaeologist be deployed on site for Investigation. Any such area to be cordoned off subject to the outcome of such investigation and subsequent consultation with the South African Heritage Resources Agency (SAHRA).

#### **Objective**

To limit damage to possible cultural historic, archaeological and palaeontological artefacts and sites, features and objects.

#### **Aspects**

Clearing of sites, digging trenches and rehabilitation and related activities.

- The Resident Engineer or his representative must ensure that all staff are trained to recognise potential cultural historic, archaeological and palaeontological artefacts and sites. The Resident Engineer or his representative must also ensure that a system is in place to halt the specific activity if such a site is identified. The Resident Engineer or his representative may consider offering a reward to personnel who identify such sites.
- If any such sites are identified construction activities in the vicinity must be halted and the find brought to the immediate attention of the Resident

Engineer or his representative who will report it to the National Heritage Council.

- \* The Resident Engineer or his representative must then arrange for the appointment of a qualified historian or archaeologist to examine the site and recommend further action.
- Following consultation with the historian or archaeologist, the Resident Engineer or his representative will be responsible for approving the resumption of normal activities.
- A Cultural Historic, Archaeological and Palaeontological Method Statement incorporating the above procedures and the site clearance plan, including timing, physical boundaries, the maximum depth of excavations and programming of these excavations, must be submitted by the appropriate contractor(s) to the Resident Engineer or his representative for approval.

#### **Targets**

- Approved Archaeological Method Statement.
- No cultural historic, archaeological or palaeontological artefacts or sites may be purposefully damaged or destroyed. (It is illegal to disturb fossils or other historic and or cultural sites and objects without the prior consent of the National Heritage Council.)

#### 4.4.5 Preservation of Topsoil

#### **Objective**

To reduce the size of all stripped areas and to store stripped topsoil separately for use in site rehabilitation and landscaping once construction has been completed.

#### **Aspects**

Storage of stockpiles of soil, conservation of additional topsoil areas, erosion control.

- Topsoil must be stripped from the work area and stockpiled on an area outside of the immediate work area, but inside the demarcated work area. Stockpiled soils shall be neat, and the dumped soil shall be flattened immediately after placement to ensure minimum exposure to wind and water.
- Topsoil must be utilized in the rehabilitation of the site once the construction work has been completed. Any excess topsoil must be removed from the site. Excess topsoil can be used in erosion control works on any other disturbed area.
- Suitable species recommended by a restoration ecologist should be used to re-vegetate the topsoil stockpiles if they are to be left for longer than 90 days. A typical seeding rate would be 6 kg seed per hectare. (Applicable only where stockpiled soil will be retained for longer than 3 months). For shorter periods a mulch of natural vegetation cut on site during the clearing operation (grass and shrubs) can be placed over the stockpiled soil.
- The maintenance of soil erosion control measures must be strictly monitored and reported.

A Topsoil Preservation Method Statement incorporating the above procedures, including timing, must be submitted to the Resident Engineer or his representative for approval.

#### **Targets**

- Approved Topsoil Preservation Method Statement.
- All topsoil must be separately stripped and stored.

#### 4.4.6 Air Quality

#### **Objective**

To minimize nuisance and potential health problems, and potential damage to flora, associated with dust and/or sand.

#### **Aspects**

Vehicle movement, stockpiling (of sand) and site clearing.

- Staff should be trained to report dust-generating activities as soon as they detect them.
- Dust can be suppressed by a combination of:
- Regularly at least daily during the dry summer spraying exposed areas with water, at a frequency to be determined by the Resident Engineer or his representative.
- Compacting exposed areas

- Using environmentally acceptable chemical and other suppression methods where appropriate
- Covering long-term stockpiles or temporarily re-vegetating them
- Halting dust generating activities when wind speed exceeds 35 km/h (See Table 2 Below)
- Imposing a 15 20 km/h speed limit on access roads
- Re-vegetating exposed areas during the operating and decommissioning phases.
- Any complaints about dust recorded in the complaints register must be immediately investigated by the Resident Engineer or his representative and addressed.
- The Resident Engineer or his representative (advised by the Site Environmental Control Officer) must implement a more rigorous dustmonitoring programme if there are persistent complaints about dust in the area.
- No waste, vegetation or any other material shall be burnt in compliance with smoke control regulations issued in accordance with the Atmospheric Pollution Prevention Act (Act 45 of 1965) and the Air Quality Act (Act 39 of 2004).

## > Table 2: Table of Wind Speeds to be Used as a Guide for Dust Control

| Wind speed (km/h) | Designation     | Description   |
|-------------------|-----------------|---|
| < 2               | calm            | smoke rises vertically, trees do not move           |
| 2-5               | light air       | smoke drift indicates wind direction                |
| 6-11              | light breeze    | weather vane moves, leaves rustle                   |
| 12-19             | gentle breeze   | leaves and twigs in constant motion                 |
| 20-29             | moderate breeze | dust and loose paper raised,<br>small branches move |
| 30-38             | fresh breeze    | small trees sway                                    |
| 39-50             | strong breeze   | large branches move, wind whistles wires            |
| 51-61             | moderate gale   | whole trees move, walking affected                  |
| 62-74             | fresh gale      | twigs break off trees, walking difficult            |
| 75-86             | strong gale     | slight structural damage occurs,<br>branches break  |
| 87-100            | whole gale      | trees uprooted, considerable structural damage      |
| 101-118           | storm           | widespread damage                                   |
| 119+              | hurricane       | severe and extensive damage                         |

#### **Targets**

- Approved Air Quality Method Statements.
- Dust visibly generated by construction activities may not exceed a deposition level of 0.5 g/m²/day. (Department of Health denotes this level as heavy fallout of nuisance dust).
- Excessive dust generation as determined visually by the Resident Engineer or his representative is not permitted.

#### 4.4.7 Noise and Vibration

#### **Objective**

To avoid disturbing residents (and employees), with particular reference to construction and decommissioning activities on the site.

#### **Aspects**

Operation of construction equipment, assorted maintenance and vehicles.

- Where possible the contractors must use equipment, which limits noise generation.
- Any complaints pertaining to noise and vibrations as recorded in the complaint register must be immediately investigated by the Resident Engineer or his representative and addressed. SABS 0103 1983 Code of Practice indicates that an increase of ambient noise levels by 5 dB (A) will induce "sporadic complaint" from the community.

- ★ The Resident Engineer or his representative <u>may decide</u> to restrict noisy activities to normal working hours i.e. Monday Friday 7am -5pm.
- Noisy vehicles, especially those travelling near residential areas, must be fitted with appropriate silencers and the drivers must be trained to drive in a manner that limits noise disturbance.
- Attempts must be made to schedule noisy activities so that they occur simultaneously and over as short a period as possible.
- Vibration inducing activities must also be simultaneously scheduled wherever possible.
- A formal noise monitoring programme must be implemented by the Resident Engineer or his representative if there are persistent complaints.
- A Noise and Vibration Method Statement must be submitted by the appropriate contractors (s) to the Resident Engineer or his representative for approval.

#### **Targets**

- Approved Noise and Vibration Method Statement.
- In terms of Section 25 of the Environment Conservation Act 73 of 1989, ambient noise levels in surrounding residential and commercial areas may not increase by more than 7 dB (A).
- The Occupational Health and Safety Act 85 of 1993 stipulates that noise levels in excess of 85 dB (A) at 1 metre from equipment are not permitted.
- Excessive noise as determined subjectively by the Resident Engineer or his representative.

#### 4.4.8 Water Consumption

#### **Objective**

To minimise the consumption of water

#### **Aspects**

Equipment servicing areas, domestic water use, water required for construction and related activities.

#### **Procedure**

- Opportunities to reduce consumption of or re-use water must be adopted wherever possible.
- Methods must be employed to ensure that water is not wasted.
  Environmental awareness training must ensure that staff are aware of the need to conserve water and to minimise the pollution of water.
- A Water Consumption Method Statement must be submitted by the appropriate contractor(s) to the Resident Engineer or his representative for approval.

#### **Targets**

- Approved Water Consumption Method Statement
- The Resident Engineer or his representative to set a realistic water consumption quota.

#### 4.4.9 Wetlands

#### **Objective:**

To minimize potential contamination and any negative impacts on the wetlands and to improve the current ecological state of the wetlands.

#### **Aspects**

Pathways close to wetlands used during or after construction, construction vehicles, stormwater, pollution

- No development below the 7.5m contour level should be allowed
- Detailed stormwater investigation is required so that natural flow of rainfall is allowed and to encourage more use by waterfowl.
- The stormwater runoff must be directed towards the wetland such that the nutrients can be removed from the water before it flows into the municipal stormwater systems.
- ♣ No development should be allowed on the wetland areas
- Alien species present should be removed and the wetland rehabilitated and preserved.
- The contractor shall ensure that silt laden water is not discharged directly into wetland or any other surface water courses, and shall take suitable measures to prevent this.

All rehabilitation and landscaping activities must be supervised and directed by a trained horticulturalist or botanist to ensure that the wetland is not inadvertently damaged.

#### **Targets**

- Improved management of the wetlands
- Increase capacity to support waterfowl thus positively impact local avifauna

## 4.4.10 Water Quality

#### **Objective:**

To minimise the potential contamination of ground and surface water

#### **Aspects**

Poorly maintained equipment and vehicles, vehicle parking areas, and contaminated run-off during the construction.

- ★ The Resident Engineer or his representative shall ensure that all precautions are taken to ensure that no surface or ground water becomes polluted. Any deliberate or unplanned pollution of water is an offence in terms of the National Water Act (Act 36 of 1998) and is punishable with a fine not exceeding R50 000-00 and / or two years imprisonment.
- No vehicle must be refuelled, serviced or repaired on the construction site, except in designated areas.

- Care should be taken at all times to ensure that dirty water does not enter into any drainage line or adjacent surface water feature.
- Temporary storm-water runoff basins and drainage ditches may have to be constructed in order to capture storm-water.
- Sediment transport of storm-water must be minimised e.g. by using silt traps, geo-textiles, diversionary berms, soil stabilisation and temporary settling ponds.
- Operational staff must not be permitted to use dams or any pond for the purpose of bathing, washing of clothes, vehicles and equipment, nor the disposal of any waste.
- Details of storage of all chemicals must be submitted to the Resident Engineer or his representative for approval.
- Contaminated soil (e.g. in vehicle parking areas, under generators) must be removed to an appropriate permitted solid waste disposal facility.
- Environmental awareness training must ensure that staff are aware of the need to prevent water pollution.
- ★ A Water Quality Method Statement must be submitted by the appropriate contractor(s) to the Resident Engineer or his representative for approval.
- Should a polluting incident occur, the Resident Engineer or his representative shall immediately contact the regional office of the Department of Water and Environmental Affairs (requirement of National Water Act). Clean-up shall take place in consultation with the Department.

## **Targets**

- Approved Water Management Method Statement.
- Government Gazette 991 of 1984 governing effluent quality.
- No contamination of groundwater.
- SABS 241 effluent discharge standard

#### 4.4.11 Waste Management

#### **Objective**

To limit the potential for groundwater and surface water pollution as well as the visible and malodorous accumulation of waste materials. To prevent littering and associated environmental impacts.

#### **Aspects**

General operation and decommissioning activities

- A system for identifying, classifying and disposing of solid waste must be devised.
- Waste should be classified as domestic (including litter), hazardous, toxic or recyclable.
- Waste materials (e.g. paper and glass) must be sorted and sent for recycling, where the quantity allows this and if the facilities are available.

Certain waste materials are valuable and could be sold to (local) entrepreneurs for further use.

- No littering is permitted on site; litterbins must be provided throughout the site. These litter bins must be predator and scavenger proof.
- Centralized eating facilities must be provided for workers in order to facilitate litter control.
- All solid waste must be disposed of off-site at suitably permitted waste facilities. This includes any building rubble left after construction.
- A register of waste disposal and sorting records must be retained by the contractors and submitted to the Resident Engineer or his representative for auditing purposes.
- Appropriate temporary disposal areas must be covered and be on an impermeable floor.
- A Waste Management Method Statement must be submitted by the appropriate contractor to the Resident Engineer or his representative for approval
- ★ The requirements of the Waste Act (Act 59 of 2008), Health Act (Act 50 of 1992) and the Environmental Conservation Act (Act 73 of 1989) are applicable to waste management.

#### **Targets**

- Approved Waste Management Method Statement.
- Environmental Conservation Act, 1989 (Act 73 of 1989) Sec 20 restricting waste disposal to permitted sites.

- National Water Act (Act 36 of 1998)
- All waste material must be removed from the site and suitably disposed of; no solid wastes shall be stored on-site for more than one week.

Most materials from building and construction sites can be recycled. The following list demonstrates some reuse options.

#### > Table 3: Reuse and recycling potential of materials (For Guidance Only)

| Materials      | Process                  | End use                                     |  |  |  |
|----------------|--------------------------|---|--|--|--|
| Concrete       | Crushed and recycled     | Used as Fill, levelling, road base          |  |  |  |
|                | Surplus                  | Used as base for paths, minor slabs         |  |  |  |
| Bricks         | Cleaned and reused       | Used in Construction, landscaping           |  |  |  |
|                | Crushed                  | Used in Driveways, landscaping              |  |  |  |
| Roof Tiles     | Cleaned and reused       | Sold, reused as roofing, in landscaping     |  |  |  |
|                | Crushed and recycled     | Into Landscaping, driveways, drainage       |  |  |  |
| Plasterboard   | Reprocessed and recycled | Into New plasterboard                       |  |  |  |
| Hardwood Beams | Denailed and reused      | Used as Flooring, furniture, fencing, craft |  |  |  |
| Other timber   | Cleaned and reused       | Used as Formwork, bridging, propping        |  |  |  |

| Materials           | Process               | End use                                   |  |  |
|---------------------|-----------------------|---|--|--|
|                     | Ground and recycled   | Into Mulch, engineered timber products    |  |  |
| Doors, windows      | Cleaned and reused    | Sold to Second hand market                |  |  |
| Fittings            | Cleaned up and reused | Sold to Second hand market                |  |  |
| Glass               | Crushed and recycled  | Into Aggregate for concrete products      |  |  |
| Carpet- wool        | Reused                | Used as Mulch, landscaping                |  |  |
| Underfelt – natural | Reused                | Used as Compost cover, mulch, landscaping |  |  |
| Underlay – rubber   | Shredded and recycled | Used in Safety barriers, speed humps      |  |  |
| Trees               | Relocated and reused  | Used in Landscaping on or off site        |  |  |
| Green waste         | Shredded and recycled | Used in Compost, mulch, fertilizer        |  |  |
| Overburden          | Screened and reused   | Used as Topsoil                           |  |  |
| Metals              | Scrap metals recycled | Into New metal products                   |  |  |
| Packaging           | Shredded and recycled | Into New packaging                        |  |  |

#### 4.4.12 Fuel and Hazardous Materials Storage

#### **Objective**

To ensure that materials are appropriately stored in order to minimise the potential for pollution and accidents.

#### **Aspects**

Storage of fuels solvents, and other hazardous and toxic substances

#### **Procedure**

- Fuel, solvents and other hazardous or toxic substances must be securely stored in a restricted, locked facility approved by the Resident Engineer or his representative.
- Fuel and hazardous materials containers must be properly and boldly labelled.
- Storage facilities must be regularly maintained.
- An emergency response plan (e.g. in case of fire) must be formulated, including steps taken to manage the capture and treatment of polluted water.
- A Fuels and Hazardous Materials Storage Method Statement must be submitted by the appropriate contractor to the Resident Engineer or his representative for approval.
- The provisions of the Fertilisers, Farm Feeds, Agricultural Remedies and Stock Remedies Act (Act 36 of 1947) must be adhered to.
- The provisions of the Hazardous Substances Act (Act 15 of 1973) must be adhered to.

#### **Targets**

- Approved Fuels and Hazardous Materials Storage Method Statement.
- Approved Emergency Response Procedure Method Statement.

Fuels and hazardous liquids must be stored in an impervious, bunded and covered area with a capacity of 110% of the largest single storage tank.

#### 4.4.13 Social Issues

#### **Objective**

To ensure the health and safety of the construction workforce. To ensure that activities associated with construction, particularly the presence of the workforce, do not create social problems or exacerbate any which may already exist.

#### **Aspects**

Staff welfare, health and safety

#### **Procedure**

#### **Employment**

- A policy of employing local people should be implemented wherever possible. This will ensure that benefits of the construction are provided to local communities and will prevent an influx of job seekers to the site. This policy must be finalized before the hiring of sub-contractors.
- Local sub-contractors should be employed wherever possible to maximise the localised economic benefits of the project.
- \* No recruitment of workers must occur on site.
- Access to the construction site must be strictly controlled.

- A policy regarding alcohol and weapons on the construction site must be formulated. This policy must be finalised prior to the commencement of work.
- A mechanism must be established to receive and address complaints from the staff.
- For security reasons, cash wages should be paid off site.

#### **Health and Safety**

- \* Adequate ablution facilities and chemical toilet facilities must be erected and maintained in good order on the site for the duration of the construction and decommissioning phase. Toilets should be removed from site when construction is completed. Waste must be disposed of at a registered waste site.
- Adequate clean drinking water must be available to construction staff at all times during the construction period.
- An area must be demarcated for staff to conduct all necessary cooking activities. The site must be selected to ensure that there is no risk of fires. It would be advisable to ensure that small gas cookers are available on site.

#### **General**

\* A Social Issues Method Statement must be submitted by the appropriate contractors to the Resident Engineer or his representative for approval

#### **Targets**

Approved Social Issues Method Statement.

Labour Relations Act, 1995 (Act 66 of 1995).

#### 4.4.14 Site Rehabilitation

#### **Objective**

To re-vegetate disturbed areas that have been disturbed during the construction phase.

#### **Aspects**

Dismantling and removal of all construction infrastructure, re-vegetation and landscaping of disturbed areas on site, replacement of topsoil. Ensuring that adequate erosion control measures are in place.

#### **Procedure**

- All compacted and previously used construction areas shall be scarified to a depth of 150 mm prior to topsoil being replaced.
- All construction infrastructure, equipment, materials and wastes must be removed from the site upon completion of construction (or earlier, in a phased manner, if possible).
- Stored topsoil must be replaced on disturbed areas to a depth of at least
   150 mm.
- These areas must be landscaped to improve the aesthetic appearance of the site; suitably landscaped berms of topsoil may be created as part of the erosion control programme.
- Any excess topsoil (not used in landscaping) must be disposed of in an environmentally acceptable manner.

- All disturbed areas must be re-vegetated with suitable (i.e. naturally occurring in the area) vegetation.
- \* A restoration ecologist should be appointed (if considered necessary by the Resident Engineer or his representative, Site Environmental Control Officer or the Environmental Consultant) to advise on and/or implement the site rehabilitation programme.
- A Site Rehabilitation Method Statement must be submitted by the contractors to the Resident Engineer or his representative for approval.
- ★ The soil erosion measures installed need to be checked regularly.

#### **Targets**

- Approved Site Rehabilitation Method Statement.
- Site rehabilitation to be completed within one month after the end of the construction period, or by an alternative date stipulated by the Resident Engineer or his representative.

#### 4.5 Trenching and Laying of Bulk Sewage and Water Pipes

#### 4.5.1 Construction Activities

The process of putting pipes underground involves a range of technological and engineering approaches depending on the circumstances. In the urban context, burying of pipes usually involves trenching or boring across roads, road verges, parks, public open space, natural veld corridors and private property.

#### 4.5.2 Installation of Pipes

The installation of the pipelines in trenches would usually involve a number of steps:

- Surveying the route to determine suitability of the ground and the material to be excavated;
- Carrying out the excavation to the depth and width specified;
- Sorting through the excavated material, discarding any material not suitable to be replaced in trench;
- Installation of a suitable bedding material (sand or the like) for support and immediate protection of the pipes;
- Installation of the pipes in the trench;
- Installation of any conduits that may be required for special or future services;
- Backfilling around pipes with suitable bedding material;
- Services are often tested at this stage to ensure no damage has occurred during the installation phase;
- Installation of warning markers over pipeline, as required;
- Filling the remainder of the trench with either the excavated material if suitable, or imported material;
- Compacting the trench to minimise future problems that may arise;
- Reinstatement of any surfaces that may be required;

#### 4.5.3 Rehabilitation

After the trench is backfilled, the surface will be reinstated with, grass or landscaping as found. Damage to infrastructure such as gutters and drain holes will be repaired. The amount of rehabilitation depends on the environment affected and can include regrassing natural strips, replacement or tree surgery on damaged trees and shrubs or direct seeding or planting with indigenous vegetation in woody areas. Rapid reseeding of disturbed areas is desirable to prevent erosion and weed infestation.

# 4.6 Description of Potentially Affected Environments and Potential Environmental Impacts

#### 4.6.1 Potentially Affected Environments

The environments potentially affected by construction of the Eco residential development in Aston Bay includes dune vegetation on north facing slopes and protected hollows (Portion 2), Gamtoos Thicket, Fynbos patches, Renosterveld and forest vegetation. The Portion 2 site has acted as open space as classified by the Jeffrey's Bay Structure plan. Portion 4 has been identified as 'critically endangered' from an environmental perspective and this should remain a 'no-go' area. The Seekoei River may also be affected by the surrounding development. The Eastern Cape has diverse herpetofauna (reptiles and amphibians) as well as some endemic species associated with coastal dunes in South Africa including the Dammara Tern, African Black Oystercatcher, White-fronted Plover and Duthie's Golden mole. Other fauna possibly affected includes small bucks, tortoises, rodents, lizards, snakes, the bar-throated apalis and the Cape batis.

It will be assumed that the most intrusive construction method of excavation will be undertaken when discussing management strategies and plans below. In general, a method will be adopted that minimizes environmental impact and costs.

# 4.7 Approach to Using Management Strategies and Plans – leave or take – give reason

Before commencing design work, the contractor should establish the type or types of land uses and environments (including ecological and economical environments) that would be covered. The key issues that may arise should be identified and reference made to any legislative requirements associated with the work.

#### > Table 4: Management of Environmental Impacts

| Land Use<br>Category            | Environmental Factors                    |   |          |                  |                        |                     |                        |                                |                  |       |                                     |
|---------------------------------|--|---|----------|------------------|------------------------|---------------------|------------------------|--------------------------------|------------------|-------|-------------------------------------|
|                                 | Flora,<br>Fauna and<br>Wetland<br>impact | Soil Erosion & Sediment Control and stabilization | Flooding | Water<br>Quality | Noise and<br>Vibration | Dust<br>Suppression | Indigenous<br>Heritage | Non-<br>Indigenous<br>Heritage | Visual<br>Impact | Waste | Construction<br>Traffic &<br>Access |
| Residential                     | •  | •   | •        | •                | •                      | •                   | •                      | •                              | •                | •     | •                                   |
| Special Use<br>(Restaurant etc) | •  | •   | 0        | •                | •                      | •                   | •                      | •                              | •                | •     | •                                   |
| Transport (Roads)               | •  | •   | •        | •                | •                      | •                   | •                      | •                              | •                | •     | •                                   |
| Open Space                      | •  | •   | •        | •                |                        | •                   | •                      | •                              | •                |       |                                     |

#### Key:

- Management strategies and plans to be implemented
- Possible strategies and plans to be implemented
- Unlikely that plans and strategies will need to be implemented

#### 4.8 Environment Protection Areas

#### 4.8.1 Flora and Fauna

Construction has the potential to disturb indigenous flora and fauna and cause disturbance to not only the proposed site, but also the surrounding environment. It is expected most fauna will move to areas of non-disturbance during construction (except nocturnal mammals and birds).

#### 4.8.1.1 Objectives

- Conserve and protect indigenous flora and fauna and avoid disturbance to them;
- Control weeds and prevent introduction to the area; and
- Prevent unnecessary disturbance to habitats and where possible enhance affected habitat by rehabilitation.

#### 4.8.1.2 Strategies

- During route selection, impact on local and regionally significant flora, fauna and habitats should be taken into account;
- Protect rare and endangered species and their habitats, remnant natural vegetation areas and corridors from direct and indirect disturbance during installation and maintenance;
- If habitat destruction is unavoidable, approval should be obtained from the appropriate authorities before work commences e.g. approval under the National Forest Act to remove a protected tree;
- Where necessary, re-vegetate area by using indigenous plant species raised from local seed stock;

- Imported soil for backfilling should be 'weed free' so that weeds do not establish in the disturbed areas;
- Avoid compaction of soil around thicket clumps by not parking heavy machinery in close proximity;
- Avoid stockpiling soil around thicket clumps and near drainage lines and other surface water areas;
- If any indigenous vegetation is removed, it must be appropriately stored for use in rehabilitation of the site; and
- Silt filter fences may be erected in drainage areas to minimise effect of sediment on aquatic environment.

#### 4.8.1.3 Monitoring and Performance Indicators

#### **Monitoring**

Disturbance/destruction of flora and habitat.

#### **Performance Indicators**

Minimal disturbance to flora and habitat.

#### 4.8.2 Wetlands

Wetlands are ecological sensitive areas and can only withstand minimal loss of area through disturbance or development. Even though the Wetland areas on the proposed site are small, no development should be allowed to take place, and these should be preserved.

#### 4.8.2.1 Objectives

- ★ To minimize potential contamination and damage on wetlands
- To improve the current state the wetlands are in
- \* Control weeds and prevent further introduction into wetlands
- \* To rehabilitate and conserve wetlands

#### 4.8.2.2 Strategies

- No development below the 7.5m contour level should be allowed
- Detailed stormwater investigation is required so that natural leaching of rainfall is allowed and to encourage more use by waterfowl.
- The stormwater runoff must be directed towards the wetland such that the nutrients can be removed from the water before it flows into the municipal stormwater systems.
- No development should be allowed on the wetland areas
- Alien species present should be removed and the wetland rehabilitated and preserved.
- The contractor shall ensure that silt laden water is not discharged directly into wetland or any other surface water courses, and shall take suitable measures to prevent this.
- All rehabilitation and landscaping activities must be supervised and directed by a trained horticulturalist or botanist to ensure that the wetland is not inadvertently damaged.

#### 4.8.2.3 Monitoring and Performance Indicators

#### **Monitoring**

Disturbance/destruction of wetland flora and habitat.

#### **Performance Indicators**

Minimal disturbance to wetland habitat and associated flora.

#### 4.8.3 Soil Erosion and Sediment Control

Sediment may be generated from installation and maintenance in natural areas, particularly in sloping terrain and near drainage areas.

#### 4.8.3.1 Objectives

- Prevent erosion resulting from construction activities;
- Prevent sediment laden runoff entering the stormwater drainage

#### 4.8.3.2 Strategies

- Establish, if necessary, sediment filter fences made of straw bales, geotextile filter fabric, gravel or sandbags around stockpiled soil and in sloping areas to capture silt laden runoff;
- Ensure sediment filter fences are maintained until work has finished in that area. Rubbish and other extraneous matter should be removed from fences as it decreases the ability of structures to filter water and trap sediment;
- Protect drainage and/or wetland areas with filter fence to ensure that sediment does not enter area and affect aquatic flora and fauna;
- Where necessary, temporary stabilisation of areas should be done before final rehabilitation;
- Re-vegetation of area with locally collected seed and individual plant specimens removed prior to construction.

#### 4.8.3.3 Monitoring and Performance Indicators

#### **Monitoring**

- Visual monitoring of the extent of runoff from construction sites during periods of heavy rainfall;
- Visual monitoring of sedimentation of drainage areas;
- Visual monitoring of erosion generated by construction activities; and
- Complaints from users.

#### **Performance Indicators**

- \* No sediment movement from construction site; and
- No complaints from users.

#### 4.8.4 Flooding

Flooding of trenches in natural areas may occur after heavy rain or groundwater seepage has occurred. These areas are likely to be near riparian or wetland areas and to prevent contamination of these areas from sediment or other pollutants, pumping of the trench may be required.

#### **4.8.4.1 Objective**

Prevent oils, greases or sediment which could be associated with the installation of cables from entering the stormwater system or seeping into groundwater.

#### 4.8.4.2 Strategies

- Trench water resulting from flooding should not be released to the stormwater system unless regulatory requirements are met; and
- If water cannot be released into the stormwater system, it should be pumped to a tanker and disposed of at an approved liquid waste disposal facility.

#### 4.8.4.3 Monitoring and Performance Indicators

#### **Monitoring**

Testing to determine quality of water in trenches prior to disposal.

#### **Performance Indicators**

No contaminated water released.

#### 4.8.5 Water Quality

Water quality may be impacted by sediments, chemicals, fuel spillages and litter being washed into the stormwater drainage and the Seaview Stream, as well as groundwater. Impact of installation and maintenance on water quality in environment protection areas may be heightened by proximity to water bodies and steep gradients.

#### 4.8.5.1 Objective

 Prevent contamination of surface and groundwater as a result of installation activities. It is important to note that activities at the development site can have a significant impact on the Seaview Riverine corridor

#### 4.8.5.2 Strategies

- Implement measures to prevent the movement of any contaminants to surface or groundwater from construction site;
- Ensure contractors and operators are aware of responsibilities and penalties under the various pollution control regulations;
- Investigation of the area may be necessary to ascertain stormwater drainage likely to be impacted by runoff from installation activities;
- If necessary, establish sediment containment systems to ensure runoff is clean before discharge to stormwater drainage;
- Restrict use of chemicals if possible. Identify chemicals to be used and develop a contingency plan for immediate clean-up of spills and reporting of spill events; and
- Implement soil erosion and sediment control measures where necessary, such as sediment filter fences around stockpiles of soil or in steeper areas to prevent sediment entering drainage lines or wetland areas.

#### 4.8.5.3 Monitoring and Performance Indicators

#### **Monitoring**

Visual inspection of effectiveness of controls.

#### **Performance Indicators**

No contamination of surface or groundwater.

#### 4.8.6 Noise and Vibration

Noise and vibration in environment protection areas may cause disruption to users and temporarily cause fauna to leave the area. Noise and vibration levels will be reduced where boring takes place.

#### 4.8.6.1 Objective

Ensure minimum disruption to fauna and other users of the area.

#### 4.8.6.2 Strategies

- The requirements of the local authority must be observed.
- If necessary, noise disturbance should be minimised by controls on noise levels of machinery and by restrictions on the hours of operation.

#### 4.8.6.3 Monitoring and Performance Indicators

#### **Monitoring**

- Complaints from custodians or users; and
- If required, monitoring may be undertaken using acoustic monitoring equipment.

#### **Performance Indicators**

- No complaints from custodians or users; and
- Results of acoustic monitoring do not exceed specified levels.

#### 4.8.7 Dust Suppression

Site clearing for services installation and road may result in the generation of dust. Where boring is used, there is a reduced risk of dust generation. Strong winds will also cause higher dust concentrations if dust suppression measures are not implemented. The impact of dust generation in these areas will depend on the nature of the environmental value(s) of these areas. The impacts could include the temporary loss of visual amenity, dust deposition on vegetation or on water bodies.

#### **4.8.7.1 Objective**

Prevent dust generation so that dust levels are minimised during installation.

#### 4.8.7.2 Strategies

- Advice may be provided by signs to users, and by consultation with the local authority of the area to warn of potential effects and determine any special requirements.
- If necessary, disturbed surfaces and soil stockpiles should be watered;
- Prompt rehabilitation of disturbed areas; and
- Cessation of work during periods of strong winds and dry conditions.

#### 4.8.7.3 Monitoring and Performance Indicators

#### **Monitoring**

- Complaints from custodians or users; and
- Visual inspection of dust generation and the extent of bare unrehabilitated areas.

#### **Performance Indicators**

- No complaints from custodians or users; and
- No dust generation observed and no extensive bare un-rehabilitated areas.

#### 4.8.8 Visual Impact

Visual impacts of the development must be minimized by an appropriate architectural theme where natural materials that blend in with the surrounding environment are used, as well as by planting of indigenous vegetation around structures. To avoid light pollution, bollard lighting can be used. Excessive street lighting must be avoided, and solar lighting would be preferable.

#### 4.8.8.1 Objective

Reduce visual impact from construction activities.

#### 4.8.8.2 Strategies

Prompt site rehabilitation

#### 4.8.8.3 Monitoring and Performance Indicators

#### **Monitoring**

Complaints from users.

#### **Performance Indicators**

- Visual amenity of the area is either re-established or enhanced; and
- No complaints from users.

#### 4.8.9 Waste

Waste generated from construction phase will be soil material and dead vegetation, as well as general construction rubble. All rubble must be removed from site. Soil will be stockpiled and used for rehabilitation. The following principles should be adhered to in case of excess production.

#### 4.8.9.1 Objectives

- Minimise the quantities of waste generated;
- Dispose of wastes in the appropriate manner; and
- Recycle waste where possible.

#### 4.8.9.2 Strategies

- Identify potential sources of waste;
- Advise operators on waste reduction, recycling goals and responsibilities;
- If necessary, make facilities available on site to facilitate recycling of waste generated by installation and maintenance activities and by personnel (drink cans, bottles, paper etc.);
- Ensure facilities are provided to prevent waste materials being blown around

#### 4.8.9.3 Monitoring and Performance Indicators

#### **Monitoring**

- Quantities and types of wastes;
- Disposal of waste materials including recycling and reuse.
- Disposal location of any contaminated waste materials.

#### **Performance Indicators**

- Reuse and recycling of materials is maximised;
- Minimal quantities of waste generated from the site; and
- Appropriate disposal methods and locations used for contaminated waste materials.

#### 4.9 Conditions of the ROD (Appendix 1)

The relevant authorisations are reproduced in Appendix 1

#### 4.10 Response to Public Complaints

The Resident Engineer or his representative must respond to queries and complaints from the public regarding operational activities. In responding to such queries and / or complaints the Resident Engineer or his representative must document all such communications in a complaint register. All queries and complaints must be reported to the Developer. All remedial action taken on a complaint must be recorded in the complaints register.

# Chapter

# Management and Monitoring Procedures

# **Chapter 5: Environmental Management and Monitoring Requirements**

#### 5.1 Introduction

This chapter outlines the systems to ensure that the Environmental Management Plan is effectively implemented, including monitoring requirements, corrective action, and auditing. The training, incentives and supporting documentation required to effect implementation of the Environmental Management Plan are also described.

#### **5.2 Environmental Compliance Monitoring**

The Resident Engineer or his representative and / or the Site Environmental Officer must devise a monitoring programme in order to ensure compliance with the procedures and targets.

The Resident Engineer or his representative is responsible for monitoring the procedures and targets applicable to each environmental management requirement. The Resident Engineer or his representative in conjunction with the Environmental Officer must decide on the frequency of inspections.

For each of the environmental management requirements, the specific elements listed below should be monitored. This list is intended as a guide and is not necessarily exhaustive; consequently, other elements might need to be monitored to ensure compliance with the relevant target.

#### 5.2.1 Restriction of Access to Sites

The Site Environmental Officer should inspect the demarcated area on a regular basis and inform the contractors of any violations or areas where markings must be replaced.

#### 5.2.2 Fauna

All animal mortalities must be recorded and reported to the Resident Engineer or his representative.

#### 5.2.3 Cultural Historic, Archaeology and Palaeontology

During earthmoving, excavation and site rehabilitation the Site Environmental Officer must monitor for potential cultural historic, archaeological and palaeontological sites daily, or more frequently at his discretion.

#### 5.2.4 Preservation of Topsoil

- Regular checks, at the discretion of the Site Environmental Officer, need to be undertaken on the storage of the topsoil and the state of the vegetation or mulch covering the topsoil.
- Checks on the erosion of the area must be carried out regularly, and it must be ensured that the erosion minimisation measures installed are effective.

#### 5.2.5 Air Quality

Dust must be visually monitored on a regular basis (daily), or more frequently in conditions conducive to dust generation, as determined by the Site Environmental Officer.

#### 5.2.6 Noise and Vibrations

- The Site Environmental Officer must subjectively monitor noise and vibration levels on a frequent basis.
- The Site Environmental Officer must implement a formal noisemonitoring programme if persistent complaints are recorded.

#### **5.2.7 Water Consumption**

Daily consumption of water must be monitored and recorded against the set water quota. Any excessive usage or peaks must be investigated.

#### 5.2.8 Water Quality

The Site Environmental Officer must visually inspect runoff basins, drainage ditches and sediment traps on a daily basis to ensure that they are in an acceptable condition.

- Other potential sources of surface and groundwater pollution must be inspected daily.
- # Effluent must be monitored (against SABS 241 standard).

#### 5.2.9 Waste Management

- The Site Environmental Officer must inspect on-site waste disposal facilities / temporary storage areas daily, to ensure that they are sufficient and that they are properly maintained.
- During site inspections the Site Environmental Officer must check for waste material, which is inappropriately (temporarily) disposed of or stored.

#### 5.2.10 Fuel and Hazardous Materials Storage

- The Site Environmental Officer must ensure that materials are stored in the designated area set aside for that purpose.
- During daily site inspections the Site Environmental Officer must check storage facilities to ensure that they are in a proper state of repair.

#### 5.2.11 Social Issues

The Site Environmental Officer must monitor the site regularly (as part of daily inspections) and be alert to potential social problems on and off site.

#### 5.2.12 Site Rehabilitation

- The Site Environmental Officer must monitor site landscaping and re-vegetation, commencing after construction
- Monitor the erosion control measures.

A restoration ecologist (if this has been recommended as described in the previous chapter) must monitor the success of rehabilitation at three monthly intervals after completion of construction, and, if necessary, recommend further rehabilitation to the Resident Engineer or his representative.

#### 5.2.13 Site Housekeeping

 The Site Environmental Officer must monitor the site for litter and other waste material

#### 5.3 Corrective and Preventive Action / Management of Environmental Problems

The Site Environmental Control Officer must devise a Corrective Action Procedure for implementing corrective and preventive action. The Corrective Action Procedure is to be implemented by all contractors and sub-contractors on site. This system should:

- Report non-compliance with procedures or targets identified during monitoring and inspections (on Incident Forms)
- \* Report other failures creating environmental problems
- Report imminent non-compliance and potential environmental problems
- Through the Resident Engineer or his representative delegate responsibility for corrective and preventive action
- Document the resolution of the reported non-compliance or environmental problem
- Impose disciplinary action where persistent non-compliance occurs.

Where possible, the Environmental Corrective Action Procedure should be integrated with the Quality, Health, Safety and, possibly, Maintenance, Corrective Action Procedures.

All contractors and sub-contractors must retain copies of the Corrective Action Procedure and other appropriate documentation and submit copies of all documentation to the Resident Engineer or his representative at a frequency to be determined by the Resident Engineer or his representative. The Resident Engineer or his representative must report to the Developer on a monthly basis on the implementation of the Environmental Management Plan.

#### **5.4 Documentation**

The Site Environmental Control Officer and Resident Engineer or his representative must devise forms (i.e. pro forma) for:

- Daily, weekly and monthly (or as appropriate) monitoring of environmental management requirements and targets (these should be integrated with those for Quality, Health, Safety and, possibly, Maintenance).
- Non-compliance (time, offender), including a register of "offenders"
- \* Recommended corrective action
- \* Resolution of non-compliance problems

These records should be made available for review by the developer and the Environmental Consultant.

The Site Environmental Control Officer and Resident Engineer or his representative must also devise forms for:

- Method Statements
- Logging complaints received in a complaint register
- Evaluating the environmental awareness training programme
- \* Evaluating the job-specific environmental training programmes
- Auditing of activities

The Site Environmental Control Officer, Resident Engineer or his representative, Contractor and sub-contractors must keep a record of all meetings attended, waste disposal documents, audits undertaken and other environmental issues as appropriate.

#### 5.5 Environmental Training

The contractors and the Resident Engineer or his representative are responsible for ensuring that all personnel have a general environmental awareness as well as specific knowledge of the potential environmental impacts associated with their work activities. All personnel associated with the project must understand the purpose and benefits of the Environmental Management Plan. The appropriate training must occur as part of an induction programme, i.e. before commencing on-site work, and should also focus on the benefits of sound environmental management.

Specific elements of environmental awareness training should include:

- Ability to recognize archaeological and palaeontological artefacts.
- Instruction in temporary waste storage and disposal systems and facilities.
- Water conservation.

- \* Awareness of existing social problems in the area.
- Incentives and rewards for good environmental practice.
- Instruction in erosion control measures.

This list is not intended to be exclusive or exhaustive.

The Resident Engineer or his representative must devise a system (including appropriate records) to evaluate regularly the training programme and recommend changes as appropriate (e.g. to coincide with the phasing of construction activities and re-training in areas of high rates of non-compliance).

## 5.6 Environmental Management after the Completion of Construction on a Specific Site (Decommissioning)

Environmental management associated with the termination of construction work on a specific site is:

- \* All cleared areas are to be rehabilitated with indigenous vegetation suitable to the cleared area.
- All visible alien plants must be removed from disturbed sites and the disturbed site rehabilitated.
- All recyclable rubble and waste, for example, scrap metal, bottles, cans and plastics are to be collected and disposed of through a registered recycling company.
- All non-recyclable rubble and solid waste be collected and disposed of at a registered waste disposal facility.

- All concrete waste is to be removed, and the rubble disposed of at a permitted facility.
- All access and service tracks are to be covered and re-vegetated with indigenous grass, to match the existing vegetation as far as possible. An erosion control procedure must be established to ensure that the tracks are rehabilitated to satisfaction and that erosion does not become a problem.

#### **5.7 Environmental Administration Matters**

#### 5.7.1 Penalties

Transgressions relate to actions by the contractor, sub-contractor or contractor team member whereby damage or harm is inflicted upon the environment or any feature of the environment and where any of the conditions or specifications of the Environmental Management Plan are infringed upon.

In the instance of environmental damage, the damage, where possible, is to be repaired and rehabilitated using appropriate measures, as specified and undertaken by appropriate specialists, for the account of the contractor or other guilty party.

Where infringement of the specifications or conditions of the Environmental Management Plan is registered, appropriate remedial action or measures are to be implemented for the account of the contractor. Where non-repairable damage is inflicted upon the environment or non-compliance with any of the Environmental Management Plan conditions is registered, the contractor may face a monetary penalty to an amount specified by the Site Environmental Control Officer in conjunction with the Resident Engineer or his representative. A first offence warning may be implemented.

#### 5.7.2 Incentives

Where commendable performance by a contractor, sub-contractor or team member is noted for work undertaken on site, in particular with regard to compliance with the specifications of the Environmental Management Plan, the Site Environmental Control Officer in conjunction with the Resident Engineer or his representative may issue an Environmental Performance Certificate to the individual or team which has earned such recognition.



### **Chapter 6: Glossary of Terms**

| Term                     | Explanation  |
|--------------------------|--|
| Ambient (air)            | Current surrounding atmospheric condition  |
| dB(A) (decibels A-scale) | A frequency-weighted noise unit used for traffic and industrial noise measurement  |
| Environment              | The surroundings in which an organisation operates, including air, water, land, natural resources, flora, fauna, humans, and their interrelation |
| Environmental Aspect     | An element of an organisation's activities, products or services that can interact with the environment  |

| Term                                      | Explanation  |
|---|--|
| Environmental Impact                      | Any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organisation's activities, products or services  |
| Environmental Impact Assessment (EIA)     | A study of the environmental consequences of a proposed course of action. An environmental evaluation or assessment is a study of the environmental effects of a decision, activity or undertaking. It is most often used within an IEM planning process as a decision support tool to compare different options |
| Environmental Management<br>System        | The part of the overall management system that includes organisational structure, planning activities, responsibilities, practices, procedures, processes and resources for developing, implementing, achieving, reviewing and maintaining the environmental policy  |
| Exotic                                    | Any plant species not falling under the indigenous definition.   |
| Integrated Environmental Management (IEM) | A process that involves the authorities and public, and integrates environmental issues with all aspects of planning*  |
| Invasive                                  | Tending to displace, or increase in cover relative to, surrounding vegetation.   |
| Palaeontology                             | (study of) life in geological past   |

Chapter

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## Appendix 1: Abbreviated CV of EAP Dr Mike Cohen

CEN Integrated Environmental Management Unit 36 River Road Walmer Port Elizabeth 6070 South Africa



Telephone: 041 - 581-2983 / 581-7811 Fax: 0865042549

Email: steenbok@aerosat.co.za

Reg No: 1996/032402/23

#### **CURRICULUM VITAE: MICHAEL COHEN**

Date of Birth:18 January 1945Nationality:South AfricanLanguages:English & Afrikaans

Specialisation in Firm: Integrated Environmental Management, Environmental

Impact Assessment, Rural Development, Natural

Resource Planning and Management

#### Qualifications:

→ BSc (Zoology, Psychology. University of the Witwatersrand)

→ BSc Honours (Wildlife Management. University of Pretoria)
 → M.Ag. (Wildlife and Fisheries Ecology. Texas A&M, 1973)
 → D.Sc. (Wildlife Management. University of Pretoria, 1988)

#### Professional Membership:

- → South African Council of Natural Scientific Professions (SACNASP)
- → Professional Member of Institute of Ecologists and Environmental Scientists
- → Member of International Association of Impact Assessments South Africa
- Member of IUCN Commission on National Parks and Protected Areas. (CNPPA) (1994 -1996)
- → Member of IUCN World Commission on Protected Areas (1997 current)
- → Honorary Member of the Institute of Environment and Recreation Management of Africa (1995)
- → Appointed to the Board of the Institute of Ecologists and Environmental Scientists (April 1997-May 2000)
- Referee to environmental assessment practitioners applying to the Interim Certification Board for Environmental Assessment Practitioners (ICB) for professional certification (2001 - present)

Appointed to the Council of the Provincial Heritage Resource Authority. Ministry of Sport, Arts and Culture. Province of the Eastern Cape (2003, Resigned)

→ Appointed to the National Executive Committee of the IAIA South Africa (2013)

#### Professional / Employment History:

May 1996 – Present - Environmental Consultant: CEN Integrated Environmental Management Unit.

July 1995 – May 1996 - Director: Eastern Cape Nature Conservation. Ministry of Economic Affairs, Environment and Tourism. Left to start own consultancy business.

January 1993 – June 1995 - Regional Director: Cape Nature Conservation. Eastern Cape Region

October 1985 – December 1992 - Deputy Director: Environment. Chief Directorate: Environmental Conservation Directorate: Environmental Management Department of Environment Affairs

July 1983 – September 1985 - Assistant Director: Environment Chief Directorate: Environmental Conservation Department of Environment Affairs

March 1981 – July 1983 - Chief Professional Officer Chief Directorate: Environmental Conservation Department of Environment Affairs

June 1978 – February 1981 - Regional Ecologist: Transvaal Nature Conservation Division: Eastern Region (TPA)

August 1976 – May 1978 - Officer-in-Charge. Suikerbosrand Nature Reserve Transvaal Nature Conservation Division (TPA)

1972 – July 1976 - Research Assistant Eugene Marais Chair of Wildlife Management University of Pretoria

#### Specialist Courses:

- → Certificate course in Public Management at the University of Pretoria (awarded Cum Laude, 1993)
- Practical Techniques in Environmental Impact Assessment conducted by the Environmental Evaluation Unit at the Graduate School of Business, University of Cape Town (1989)
- → International Seminar on the Administration of National Parks and Equivalent Reserves held in the United States, Canada and Mexico (1973)
- → Short course in Tropical Ecology while at Texas A & M University (1973)

#### International Experience:

- → Nominated as a member of an international team to evaluate the professional activities of the Nature and National Parks Protection Authority of Israel (Evaluation was to be conducted during November 2000)
- → 1994 Represent South Africa as Scientific Councillor on the Convention on Migratory Species - Nairobi, Kenya
- → 1994 Alternate delegate for South Africa at the Conference of the Parties of the Convention on Migratory Species - Nairobi, Kenya

- → 1994 -Member of the negotiations team for the African Eurasian Waterfowl Agreement - Nairobi, Kenya
- → 1993 -Represent South Africa as Scientific Councillor on the Convention on Migratory Species - Bonn, Germany
- → 1992 -Visit to Israel to hold preliminary discussions on a bilateral agreement on Nature and Environmental Conservation
- → 1992 -Participate in the IV World Congress on National Parks and Protected Areas - Caracas - Venezuela - Present two papers at the Congress and participate in numerous working groups on a wide range of protected area issues
- → 1991 1995 South African Representative on the Scientific Council for the Convention on Migratory Species
- → 1990 -Visit to England and Israel (met with a variety of nature and environmental conservation organisations) for discussion on joint projects and for discussions on national and regional protected area systems plans
- → 1989 -Member of South African delegation to the XV Antarctic Treaty meeting, Paris
- → 1988 -Delegate to the 17th IUCN General Assembly Costa Rica
- → 1986 -Seminar on Environmental Education Israel

#### **Publications and Papers:**

- → Cohen, M. & M.H. Gerneke 1976. Preliminary report on the intermandibular cutaneous glandular area and the infraorbital gland of steenbok. J.S. Afr. Vet. Ass.47(1)I35-37
- → Gerneke, W.H. & M. Cohen 1978. The micromorphology of the glands of the infra-orbital cutaneous sinus of the steenbok. Onderstepoort J. vet. Res. 45(2): 59-66
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- → Cohen, M. 1984. The South African Natural Heritage Programme. Department of Environment Affairs.
- → Cohen, M. 1984 Hippotraqus equinus. CITES Identification manual. Volume 1.
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- → Cohen M. and E. Marrao 1985. The NAKOR National Plan for Nature Conservation and Related Programmes. In: Conservation: The Broad View. The Wildlife Society of Southern Africa.
- → Cohen, M. and M.L. Hugo 1986. Conservation outside of officially designated areas - with emphasis on the urban environment. Parks and Grounds. 38: 15-23.
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#### **Environment Affairs**

- → Cohen, M. and G.I. Cowan. 1989 The Southern African Plan for Nature Conservation and Related Programmes. Paper presented to the International Symposium on Conserving Biotic Diversity in Southern Africa.
- Ohen, M. 1989. The South African Natural Heritage Programme. Paper presented to the SADF Symposium on Multiple Land Use: The Role of secondary conservation areas in the RSA.
- → Cohen, M. 1990. Environmental Management and the role of Protected Areas in Sustainable Development. Paper presented to the Sikelele Wildlife Awareness Course at the Avroy Schlain Auditorium, Johannesburg. April 30 - May 4, 1990.
- → Cohen, M. 1990. Environmental Conservation and the Landscape Contractor (In press.)
- → Cohen, M. 1990. The South African Natural Heritage Programme A Review. Environmental Planning and management 1(3):14-21.
- → Cohen, M. 1990. Environmental Conservation and the role of the Health and Beauty Therapist. Paper presented to the 16th National Congress of the SA Institute of Health and Beauty Therapists.
- → Cohen, M. 1992. The South African Natural Heritage Programme A new partnership. Paper presented to the IV World Congress on National Parks and Protected Areas.
- → Cohen, M. 1992. The South African Plan for Nature Conservation. Paper presented to the IV World Congress on National Parks and Protected Areas.
- → Cohen, M. 1992. Garden Ecology. Paper presented to the Transvaal Horticulture Society.
- → Cohen, M. 1994. The ecology of a suburban garden. Paper presented to the Port Elizabeth Horticultural Society.
- Oohen, M and Powell M. 1994. The Value of the Race Course to the Urban Open Space Network. Paper Presented to the 15th Annual National Racecourse Managers Conference. Port Elizabeth.
- → Cohen M, Wahl, M and Weilbach D. 1994. The South African Natural Heritage Programme - A new partnership. p150-154. In: W. Van Hooven, H Ebedes and A Conroy (eds) Wildlife Ranching: A Celebration of Diversity. Promedia. Pretoria 400nn
- → Cohen, M. 1995. The Environment and the Reconstruction and Development Programme. Paper presented at the Institute of Environment and Recreation Management (Africa) Seminar, October 1995, Riverside Sun, Vanderbijlpark.
- → A modified version of the above paper, Environment, Reconstruction and Development - Challenges for the New South Africa, was presented to the First Annual general Meeting of the Community Environmental Network in Port Elizabeth during October 1995.
- → Cohen, M and Milliot Communications The South African Heritage Garden Programme. This text covers basic ecological principles and ideas for a number of community based programmes.

Several popular articles published in:

- → Environment RSA
- → SA Heritage
- → Natura
- → Custos
- → Conserva
- → Farmers Weekly
- → Cosmopolitan
- → Environmental Planning and Management
- → Parks and Grounds

## Major Unpublished Departmental Reports - Transvaal Nature Conservation Division:

- → Cohen, M., Scholtz, A.T., and G. Reichel 1978. A preliminary survey of the cheetah on the Suikerbosrand Nature Reserve. 69 pp.
- Cohen, M. 1980. Evaluation of wildlife populations for reserves in the Suikerbosrand sub-region. 55 pp.
- → Cohen, M. 1980. Unit Management Plan for Interpretation and visitor services. Sub-plan 6. Nature Trails.
- → Cohen, M. and G.I. Cowan 1980. Unit Management Plan for interpretation and visitor services. Sub-plan 5. Youth Camps

## Committees and Working Groups (served on while in the employ of the Department of Environment Affairs, DEA)

- → Central Committee for the Delimitation of Mountain Catchment Areas
- → Advisory Committee for Pretoria Technikon
- → Advisory Committee for Technikon RSA
- → National Committee for Nature Conservation
- → Magaliesberg Nature Area Management Committee
- → SA National Committee for IUCN
- → West Rand Guide Plan Committee
- → Pietersburg Guide Plan Committee
- → SA Plan National Working Group
- → SA Plan Regional Working Groups Regions: Al, All, B, C, D, E, F, G, H and J
- → Tourism Strategy Working Group RDAC Region F
- → Environmental Conservation Committee RDAC Region F
- → Environmental Conservation Committee RDAC Region G
- → Antarctic Management Committee
- → Cat Task Team for Marion Island

- → South African Committee for Antarctic Research
- → Advisory Committee on the National Grazing Strategy
- → Co-ordinating Committee for the Kruger National Park Rivers Research Programme
- → Co-ordinating Committee for the St Lucia Environmental Impact Study
- → Multilateral Working Group on Nature and Environmental Conservation
- → SARCCUS: Standing Committee for Nature Conservation, Wildlife Utilization and Management
- → Committee for Environmental Management
- → Working Groups for the Committee for Environmental Management (these working groups have been combined to form a single Nature Conservation Working Group):
  - \* Working group on invasive biota
  - \* Threatened species working group
  - \* Problem animal working group
  - \* Working group on soil erosion
  - \* Working group on the SA Plan

Under the old FRD system, Mike represented the DEA on the following working groups and committees:

- → Committee for Nature Conservation Research
- → Working group on threatened plants
- → Habitat conservation working group
- → Nature Conservation working group
- → Working group on rivers
- → Conservation Behaviour working group



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#### CHIEF DIRECTORATE: ENVIRONMENTAL AFFAIRS

#### **FAX COVER SHEET**

FAX NO:

042 2920370

**DATE: 31 March 2009** 

TO:

Mr. D. Du Preez - Glenny Buchner Trust

cc:

Mr. T. Avis - CES (046 6226564)

Ms. S. Maree - Kouga Municipality (086 5227356)

FROM:

**Andries Struwig** 

NO. OF PAGES: 1+16

RE:

ROD FOR APPLICATION - REF: EC08/2c/172-04

For your attention, ODTH AFRICAN POLICE SURNING ULBUT BUSAN DUFFITE

2 1 AUG 2016

ANDRIES STRUWIG ASSISTANT MANAGER: EIM

**CACADU REGION** 

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E-mall: Andries.Struwig@deaet.ecape.gov.za

Ref: EC08/M/172-04 Eng: A. Struwig

Glenny Buchner Trust PO Box 50 Jefferys Bay 6330

Attention: Mr. D. Du Preez

Fax: 042 292 0370

AUTHORISATION IN TERMS OF SECTION 22 OF THE ENVIRONMENT CONSERVATION ACT, ACT 73 OF 1989, TO UNDERTAKE A LISTED ACTIVITY AS SCHEDULED UNDER SECTION 21 OF THE ACT: CHANGE OF LAND USE FROM AGRICULTURE TO ANOTHER USE TO FACILITATE AN ECO-RESIDENTIAL DEVELOPMENT ON PORTIONS 1, 4A&B, 5 AND REMAINDER OF THE FARM SWANLAKE NO. 755, ASTON BAY WITHIN THE KOUGA **MUNICIPAL AREA** 

Refer to your application (reference number EC08/2c/172-04) for authorisation in terms of the Environment Conservation Act, Act 73 of 1989 to change the land use of Portions 1, 4a&b, 5 and Remainder of the Farm Swanlake No. 755, Aston Bay, from Agriculture to another use to facilitate an eco-residential development thereon.

Authorisation is hereby granted in terms of Section 22 of the Environment Conservation Act, Act 73 of 1989, subject to the conditions contained in the Record of Decision attached as Annexure One.

> 2 1 AUG 2016 KLIENTE DIENS SENTRUM

DAYALAN GOVENDER NSE POLISIEDIENS I PHONE THAT DEPUTY DIRECTOR: ENVIRONMENTAL AFFAIRS

CACADU REGION

DATE: 31 MARCH 2009.

CC: CES (Dr T. Avis)

Kouga Municipality (Ms. S. Maree)

Fax: 046 622 6564 Fak: 086 522 7356









THAT MERDIE DOKUMENT 'N WARE ARD.

MINE POIGURENT WAT AAN MY VIR VAN

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PROVINCE OF THE **EASTERN CAPE CACADU REGION** 

Private Bag X 5001, Greenacres, Port Elizabeth South Africa, 6057

041 6085800 041 5085865 Phone:

Fax:

E-mail: andries.struwig@deaet.ecape.gov.za

#### **ECONOMIC DEVELOPMENT AND ENVIRONMENTAL AFFAIRS**

## **ANNEXURE 1** RECORDIONIDECSION EC08/M/172-04

#### 1. Description of Activity

It is proposed to subdivide the Farm Swanlake No. 755, Aston Bay, near Jeffreys Bay into various portions in order to alienate such to various buyers. It is subsequently proposed to establish residential development on each portion. The following portions of land are proposed:

Portion 1: 16.34ha;

Portion 4a&b: 26.34ha:

Portion 5: 9.0ha;

Portion 6: 1.88ha; and

Remainder: 40.95ha.

The proposed development will be an "Eco-residential" development according to the layout elternative presented as Figure 6.3 in the document titled "Addendum Environmental Report to the Final Scoping Report of November 2007" dated January 2009 and includes the following:

- 100 development footprints (free-standing units) with a maximum area of disturbance of
- 22 Town houses (16 on Portion 4 and 6 on Remainder); and
- 271 Erven with a minimum erf size of of 600m<sup>2</sup>.

Proposed development on the various portions are therefore as follows:

Portion 1:

30 development footprints and 100 erven;

Portion 4a:

20 development footprints;

٠

Portlon 4b:

Portlon 5:

16 "townhouses";

Portion 6: ٥

15 development footprints and 49 erven;

and

Transport zone to accommodate the existing access road to Aston Bay;

Remainder:

35 development footprints and 122 erven.

EC08/M/172-04

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#### ECONOMIC DEVELOPMENT & ENVIRONMENTAL AFFAIRS

CHIEF DIRECTORATE: ENVIRONMENTAL AFFAIRS

This provides for a total of 393 units, of which 271 will comprise of single residential erven, 100 will comprise of development footprints and 22 will comprise of "townhouses. In this regard it is proposed to place the development footprints (only buildings and no garderns) in the buffer zone between the main development and the ecological corridor, while the erven are concentrated on the edges of the development and the town houses will be clustered around the southern entrance to the development, adjacent to the Seekoei Nature Reserve. It must be noted however, that conditions contained in this Record of Decision will result in changes to the above numbers and the location of the different unit types.

The proposed development includes associated service infrastructure such as roads, electricity, sewage and potable water as well as an estate office, gates for controlled access and limited play areas for children.

While a "lodge" is indicated on Portion 4a on the said layout plan, it is <u>not</u> included in the Authorisation and this Record of Decision as the establishment of a resort has not been included in the application nor assessed or described in the supporting documentation.

The specific details of the development are described in Chapter 5 of the Final Scoping Report for this application (dated November 2007) as amended in the document titled "Addendum Environmental Report to the Final Scoping Report of November 2007" dated January 2009.

The change in land use is a listed activity in terms of Item 2(c) of Schedule 1 to GN No. R1182 of 5 September 1997 for which an authorisation needs to be issued in terms of Section 22 of the Environment Conservation Act, Act 79 of 1989.

#### 2. Location of Activity

The proposed development is situated on Portions 1, 4, 5, 6 and the Remainder of the Farm Swanlake No. 755 immediately north west of the Aston Bay residential area and west of Marina Martinique. Portion 1 is separated from the rest by the access road to Aston Bay.

**Contact Details of Applicant** Glenny Buchner Trust Name: Contact Person: Mr. D. Du Preez PO Box 50 Address: Jeffreys Bay 6330 042 292 0047 Telephone: 042 292 0370 Fay: Cell: 082 659 2655 Page 2 of 15 EC08/M/172-04 2 1 AUG 2016 KLIENTE DIENS SENTRUM SUID AFRIKAAMSE POLISIEDIENS

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(FAX)041508 5865

P. 005/017

## ECONOMIC DEVELOPMENT & ENVIRONMENTAL AFFAIRS CHIEF DIRECTORATE: ENVIRONMENTAL AFFAIRS

#### 4. Contact Details of Consultant

Name:

Coastal and Environmental Services

Contact Person:

Dr T. Avis

Grahamstown

6140

Telephone:

046 622 2364

Fax: Email: 046 622 6564 sec@cesnet.co.za

#### 5. Details of Site Visit

Site inspections were conducted by Mr. A. Struwig of this Department on 3 September 2007 and 9 May 2008. The site visit on 9 May 2008 was conducted in the company of Prof. R. Lubke from CES.

#### 6. Decision

Authorisation for the proposed change in land use and subsequent development on Portions 1, 4, 5 and Remainder of the Farm Swanlake No. 755 is granted subject to the conditions listed below in Section 8.

#### 7. Duration of Authorisation

- 7.1. The change in land use of Portions 1, 4, 5 and remainder of the Farm Swanlake No. 755 is to be effected within 12 months of the date of signature of this authorisation, by means of a rezoning in terms of the Land Use Planning Ordinance, Ordinance 15 of 1985.
- 7.2. Construction of service infrastructure (e.g. road upgrade, bulk infrastructure connections, etc.) to commence within 6 months of the rezoning being effected and to be completed within 12 months of commencement.
- 7.3. Construction of individual dwellings to commence within 6 months of the completion of service infrastructure installation. Construction of all dwelling opportunities is to be completed within 18 months of sale to the new property owner or within 12 months of any subsequent re-sales which period may not exceed 60 months.
- 7.4. Conditions relating to the operational phase of the project are valid for the lifetime of the project.

#### 8. Conditions of Authorisation

Please note that the Department of Economic Development and Environment Affairs may review, delete, add to or amend any of the following conditions in the event of new information

coming to light.

ECOS/M/172-04 FRITAN COLL S - 10900 CUENT DENVICES CENTRE SANDTON

> 2 1 AUG 2016 KLIENTE DIENS SENTRUM

SUID AFRIKAANSE POLISIEDIENS

DEDER CACADU

(FAX)041508 5865

P. 006/017

## ECONOMIC DEVELOPMENT & ENVIRONMENTAL AFFAIRS CHIEF DIRECTORATE: ENVIRONMENTAL AFFAIRS

#### 8.1. General conditions

- 8.1.1. This authorisation is subject to all other statutory requirements being met, notably the requirements of the Land Use Planning Ordinance, Ordinance 15 of 1985, the National Forest Act, Act 84 of 1998, the Conservation of Agricultural Resources Act, Act 43 of 1983, the Subdivision of Agricultural Land Act, Act 70 of 1970, and the National Water Act, Act 36 of 1998.
- 8.1.2. This authorisation pertains only to the activities as described in Section 1 of this Record of Decision. Any other listed activities would be subject to authorisation in terms of Section 24 of the National Environmental Management Act, Act 108 of 1998.
- 8.1.3. Any changes in the project that could have significant environmental Impacts and that would differ from that which was authorised by this Department, is to be submitted to the Department for approval prior to such changes being effected.
- 8.1.4. The conditions of this authorisation shall form part of any contract entered Into between the applicant and any contractor and/or sub-contractor.
- 8.1.5. Should any environmental damage be detected, that in the opinion of this Department, is the result of the development, then the applicant shall be required to make good that damage to the satisfaction of the said authority at his/her own expense.
- 8.1.6. In the event of any dispute as to what constitutes environmental damage, this Department's opinion will prevail.
- 8.1.7. This Department must be notified, within 30 days, of any change of ownership/ project developer. Conditions established in this Record of Decision must be made known to and are binding on the new owner/ project developer.
- This Department must be notified of any change of address of the owner/ project developer.
- 8.1.9. Notification of this Record of Decision (ROD) must be circulated to any interested and affected party who has registered an interest in the proposed development, within one week of receiving this ROD. In addition, all adjacent landowners and relevant authorities, including the Department of Agriculture, Department of Water Affairs and Forestry, the South African Heritage Resources Authority (SAHRA), and the Municipal planning department must be notified of the Record of Decision. The following must be advertised in the local newspaper within 5 days of the date of this ROD or in the next edition of the newspaper, whichever occurs first and is the responsibility of the applicant to ensure that such tasks are undertaken:
  - 8.1.9.1. The decision contained in the ROD, and date of issue of the ROD;
  - 8.1.9.2. A description of the proposed development;
  - 8.1.9.3. A description of the appeal procedure; and
  - 8.1.9.4. Notification that any comments must be submitted directly to this Department within 30 days of the Issue of the ROD (Include this Department's address and application reference number).
- 8.1.10. The listed activity as described in Section 1 of this Record of Decision and hereby authorised may not commence prior to the lapsing of the appeal period as provided in Section 10 of this Record of Decision.



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#### ECONOMIC DEVELOPMENT & ENVIRONMENTAL AFFAIRS

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- 8.2. Conditions specific to establishment (inclusive of layout and design) of residential units and infrastructure
- 8.2.1. The layout presented in Figure 6.3 of the document titled "Addendum Environmental Report to the Final Scoping Report of November 2007" and dated January 2009, to be amended and submitted to this Department for approval prior to any construction commencing on site (inclusive of the installation of service infrastructure).
- 8.2.2. The amended layout plan to provide for amongst others the following:
  - 8.2.2.1. No development inclusive of service infrastructure, is to be located in any areas where the vegetation has been identified as being of very high sensitivity:
  - 8.2.2.2. No erven are to be located in any of the areas where the vegetation has been identified as of high sensitivity as depicted in Figure 4.2 on Page 17 of the document titled "Addendum Environmental Report to the Final Scoping Report of November 2007" and dated January 2009 and only individual footprints representing "free standing units" (hereafter referred to as "free standing footprints") with a maximum size of 400m2 are to be considered for placement in these areas:
  - 8.2.2.3. Concomitant to Condition 8.3.2.2, the placement of free standing footprints in any of the areas where the vegetation has been identified as of high sensitivity, to be done in such a manner that the length of access roads are minimised;
  - 8.2.2.4. No other Infrastructure, Inclusive of the proposed playparks, are to be located within any of the areas where the vegetation has been identified as of high sensitivity;
  - 8.2.2.5. The lodge component included on Portlon 4 to be removed as it is not considered to be part of the development;
  - 8.2.2.6. The total number of units to be accommodated on the various portions of land not to exceed the total number of units presented in Figure 6.3 being 393:
  - 8.2.2.7. The exact location of free standing footprints on the various portions of land inclusive of coordinates;
  - 8.2.2.8. The exact location of all other components of the development inclusive of access roads (also access roads to Individual units), entrance gates and other service infrastructure; and
  - 8.2.2.9. No Infringement / encroachment of development into the ecological zones as depicted in Figure 6.3.
- 8.2.3. The individual free standing footprints to be restricted to a total footprint of 400m<sup>2</sup>.
- 8.2.4. Concomitant to Condition 8.2.3 the actual development footprint on each of the 400m<sup>2</sup> free standing footprints to be restricted to a maximum of 250m<sup>2</sup>, inclusive of any outbuildings, decking, swimming pools, paved areas etc.
- 8.2.5. The height of any buildings associated with the different components of the development to be restricted to 5m from natural ground level.
- 8.2.6. All roads located in areas of high vegetation sensitivity as well as through any of the ecological zones, to be restricted to a maximum width of 3m with pull-off bays at appropriate intervals to allow for the passing of vehicles in different directions.

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#### **ECONOMIC DEVELOPMENT & ENVIRONMENTAL AFFAIRS** CHIEF DIRECTORATE: ENVIRONMENTAL AFFAIRS

- 8.2.7. The mitigation measures detailed in the document titled "Addendum Environmental Report to the Final Scoping Report of November 2007" and dated January 2009, for each of the identified impacts must be adhered to.
- 8:2.8. All black water, as a minimum, whether treated by "blolytix" or not, must be taken off to Municipal sewerage points. No treated effluent or other artificial irrigation may be released into areas of natural vegetation.
- All storm water and runoff from roofs and paved areas must be collected in rainwater tanks for slow release or for household usage.
- Ownership of individual erven and free standing footprints to be by means of freehold
- 8.2.11. A Homeowners Association/s (HOA) must be established to manage all aspects of the different components of the development and each individual owner of an erf / footprint to be bound as a condition of title to be a member of such.
- All land other than the individually owned erven and free standing footprints to be registered in the name of the HOA and managed as common property.
- 8.2.13. All areas included in the ecological zone as identified in Figure 6.3 as well as all other areas that will remain undeveloped, inclusive of the undeveloped areas between Individual free standing footprints, to be zoned as Private Open Space III to allow for declaration thereof as a Private Nature Reserve.
- 8.2.14. Low flow technology such as low flush toilets, must form part of the water and sanitation system to reduce potential water consumption and waste water loading of the sanitation system.
- 8.2.15. Final design and specification of any perimeter fencing to be submitted to this department for approval prior to construction thereof commencing.
- 8.2.16. The Design Guidelines by IDC Consultants dated January 2009 attached as Annexure 4 to the Addendum Environmental Report to the Final Scoping Report of November 2007, and dated January 2009 must be implemented and adhered to with the addition of applicable conditions contained within this Record of Decision.
- 8.2.17. A detailed landscaping plan to be complled and submitted to this Department for approval prior to such plan being implemented. The landscaping plan to provide for amongst others:
  - The restoration / rehabilitation of transformed areas that will remain 8.2.17.1. undeveloped;
  - 8.2.17.2. Landscaping guidelines for individual landowners (inclusive of a restriction to use indigenous vegetation that occurs naturally in the area); and
  - 8.2.17.3. Provision of boardwalks instead of pathways in natural areas to minimize the risk of erosion.
- 8.2.18. No landscaping and / or private gardening, whether for ornamental, consumptive or any other purpose may take place on the property other than as stipulated in the landscaping plan provided for in Condition 8.3.17

Conditions specific to vegetation. 8.3.

No gardens are permitted around Individual dwellings situated on the free standing 8.3.1. footprints and only vegetation along roadways to the house and the footprint area of the house may be disturbed.

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#### **ECONOMIC DEVELOPMENT & ENVIRONMENTAL AFFAIRS**

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- 8.3.2. A trained horticulturist or botanist must supervise or direct all vegetation clearing, landscaping and rehabilitation activities.
- 8.3.3. All vegetation clearing to be done by hand.
- 8.3.4. The 1,9 ha of Impacted and heavily Impacted thicket vegetation in the "go but" area as depicted in Figure 5 of the Addendum Environmental Report to the Final Scoping Report of November 2007 dated January 2009, must be rehabilitated to achieve good or pristine condition.
- 8.3.5. The 2,2 ha of impacted grassland vegetation in the "go but" and "no go" areas as depicted in Figure 5 of the Addendum Environmental Report to the Final Scoping Report of November 2007" and dated January 2009, must be rehabilitated to achieve good or pristine condition.
- 8.3.6. The 7,5 ha of impacted renosterveld vegetation in the "go but" and "no go" as depicted in Figure 5 of the Addendum Environmental Report to the Final Scoping Report of November 2007" and dated January 2009, areas must be rehabilitated to achieve good or pristine condition.
- 8.3.7. The 1.1 ha of Impacted fynbos vegetation in the "go but" and "no go" areas as depicted in Figure 5 of the Addendum Environmental Report to the Final Scoping Report of November 2007" and dated January 2009, must be rehabilitated to achieve good or pristine condition.
- 8.3.8. All invasive alien vegetation must be removed from the whole property in a controlled and phased manner and recolonisation of such prevented.
- 8.3.9. All open ground in the "go but" areas as depicted in Figure 5 of the Addendum Environmental Report to the Final Scoping Report of November 2007" and dated January 2009, which is not developed must be appropriately rehabilitated vegetation sourced from other areas on the site. To this extent development in 'go but' areas must be concentrated in areas of bare ground in order to reduce rehabilitation and preserve vegetation in a good state.
- 8.3.10. The salt marsh area must be closed off to human access to protect the fragile habitat.
- 8.4. Conditions specific to fauna.
- 8.4.1. The 100m "no go" area on the western boundary as depicted in Figure 5 of the Addendum Environmental Report to the Final Scoping Report of November 2007" and dated January 2009, must be enforced.
- 8.4.2. Speed limits along access roads must be implemented to minimize potential collisions with animals.
- 8.4.3. Pets may not be kept at dwellings on the free standing footprints, while dogs on erven must be fenced in and kept on a leash when out. Cats are not allowed.
- 8.5. Conditions specific to the provision of services.
- 8.5.1. A Service Level Agreement must be entered into with the Kouga Municipality with respect to provision of bulk services (water, sewerage and electricity).
- 8.5.2. The developer is to pay for augmentation of any services required for the development.

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#### **ECONOMIC DEVELOPMENT & ENVIRONMENTAL AFFAIRS**

CHIEF DIRECTORATE: ENVIRONMENTAL AFFAIRS

- 8.5.3. All augmentation measures to existing infrastructure to ensure that the proposed development can be serviced must be completed prior to construction commencing on any of the sites.
- 8.5.4. The provision of water, sewage and electrical infrastructure must be accommodated within the internal road system and the individual access roads.
- 8.5.5. No overhead power lines to individual development nodes to be allowed.
- 8.5.6. Electricity cable and pipes must be laid in the same ditch.
- 8.5.7. Resource conservation measures must be implemented in both the design of the development and during the operational phases, especially with respect to water and electricity. Additional measures must be considered where possible. Buildings must be fitted with water tanks to ensure that rain water is hervested.
- 8.5.8. Construction of roads must occur along contours where possible and material for roads must be sourced from approved sources.
- 8.5.9. Access roads must be as approved by the District Roads Engineer.
- A comprehensive Storm Water Management Plan must be compiled and submitted to 8.5.10. the Kouga Municipality for approval. A copy of the approval and comments must be sent to this Department. The Plan must include amongst others:
  - 8.5.10.1. Measures to reduce storm water runoff from hardened surfaces, as far as possible, including permeable paving to enhance infiltration, as appropriate, to ensure that runoff from the development is maintained at pre-development levels;
  - 8.5.10.2. Dissipation measures must be implemented at discharge points for run-off water from the roads to prevent erosion;
  - 8.5.10.3. No erosion of the wetlands must be allowed to occur; and
  - 8.5.10.4. No waste water from the development must be allowed to enter the drainage lines on site.
- 8.6. Conditions specific to social-economic aspects.
- Workers from the local community must be recruited for all phases but with specific 8.6.1. emphasis on the operational phase.
- 8.6.2. A forum must be created for the local communities to be informed of potential job and business opportunities.
- 8.7. Conditions specific to the construction of service infrastructure and the residential components of the residential estate.
- The Construction Environmental Management Plan (CEMP), submitted in the 8.7.1. Addendum Environmental Report to the Final Scoping Report of November 2007 dated January 2009 to be implemented for the construction phase of the project. The CEMP and associated specifications must be amended to include amongst others:
  - 8.7.1.1. Clarification of the acronym CEAP;
  - Applicable conditions as contained in this Record of Decision; 8.7.1.2.
  - General principles of environmental management as applicable to 8.7.1.3. construction activities including environmental best practice, erosion control, minimisation of dust, etc;

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#### economic development & environmental affairs

CHIEF DIRECTORATE: ENVIRONMENTAL AFFAIRS

- 8.7.1.4. A waste management plan to address waste disposal and management, inclusive of building waste / rubble, during the construction phase;
- 8.7.1.5. Clear stipulations as to who is responsible and accountable for what actions; and
- 8.7.1.6. A general code of conduct for any contractor that might be carrying out any work on the development site.
- 8.7.2. General principles of environmental management as provided for in Condition 8.7.1.3 to provide for amongst others, the following:
  - 8.7.2.1. Generators and fuel supply needed during construction must be placed on trays, which rest on clean sand. Once construction has been completed, this sand must be removed from site and disposed of at a registered waste disposal site.
  - 8.7.2.2. Cleared areas and excavated material generated during construction must be dampened to minimise dust until such time that this material has been utilised during the rehabilitation process or that it can be removed and disposed.
  - 8.7.2.3. No cement/ concrete mixing to take place on the soil surface. Cement mixers to be placed on large trays to prevent accidental spills from coming into contact with the soil surface.
  - 8.7.2.4. No fill material to be brought on site. Excess material remaining after construction, to be removed from the site and disposed of at a registered waste disposal site.
  - 8.7.2.5. Any substrate contaminated by the spillage of hydrocarbons or other pollutants to be removed from site and disposed of at an appropriately registered waste disposal site.
  - 8.7.2.6. No waste from construction or otherwise, may be disposed of on site. All waste generated on site, to be removed from site and disposed of at a registered waste disposal site. In this regard adequate litter drums or other suitable containers must be located on site to ensure that waste generated on site is disposed of in a sultable and timeous manner. Containers must be such that dogs and other scavengers cannot gain access thereto.
- 8.7.3. A suitably experienced Environmental Control Officer (ECO) must be appointed for the duration of the construction phase of the project. The ECO must ensure implementation of and compliance with conditions of this Record of Decision and the stipulations of the EMP.
- 8.7.4. Non-compliance with any stipulation in the approved CEMP will be regarded as non-compliance in terms of this Record of Decision.
- 8.7.5. A performance based requirement with regard to environmental impact management during construction must be included in all contracts related to the construction phase of the development.
- 8.7.6. Access to the construction site must be limited to construction workers only and only security personnel may overnight on the site.

8.7.7. The use of earthmoving equipment to facilitate the provision of services to be restricted to within approved roadways outside areas of high vegetation sensitivity.

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#### ECONOMIC DEVELOPMENT & ENVIRONMENTAL AFFAIRS CHIEF DIRECTORATE: ENVIRONMENTAL AFFAIRS

- No earthmoving equipment for whatever purpose is allowed within areas of high vegetation sensitivity and all vegetation clearing and service installation to be done by
- 8.7.9. No blanket clearing of vegetation is to take place on the site and construction on the site is to take place in a phased manner. Upon the completion of construction of each phase, rehabilitation of such area is to be completed prior to the commencement of construction on the next phase. Rehabilitation is to make use of plants removed prior to construction. Landscaping of the site is to make use of these and other indigenous vegetation characteristic of the area
- 8.7.10. The development footprint of individual dwellings as well as the areas to be used for the installation of service infrastructure and the approach road to each dwelling, to be clearly demarcated with pegs and danger tape. Vegetation on each site to be restricted to such demarcated areas.
- 8.7.11. All areas outside of areas demarcated in terms of Condition 8.7.9 are deemed to be "no go" areas, to which all access must be prohibited.
- 8.7.12. Stockplling of any building material and machinery must be accommodated on individual construction sites as demarcated and In accordance with the CEMP.
- Soll exposure must be limited to the actual construction sites and no vegetation may B.7.13. be removed on the remainder of the site.
- 8.7.14. The ECO must ensure that no poaching of animals on site takes place and that slower moving species, such as tortoises are appropriately managed.
- 8.7.15. An alien vegetation control program must be instituted for the removal of allen vegetation in a controlled and phased manner, including rehabilitation of areas that have been degraded through Invasion by exotic plant material.
- 8.7.16. Any areas disturbed on individual sites by construction activities must be rehabilitated with indigenous vegetation immediately after construction on that individual site has been completed.
- 8.7.17. Construction activities must be restricted to normal working hours being 07:00 to 17:00 on weekdays. No construction may take place on weekends or public holidays.
- 8.7.18. Prior to project implementation a once over botanical survey must be carried out by a botanical specialist, to establish whether any species which are of special concern or protected in terms of the Nature and Environmental Conservation Ordinance, Ordinance 19 of 1974, or in terms of the National Forests Act, Act 84 of 1998 occur on the areas of the site earmarked for development.
- 8.7.19. Specimens identified in terms of Condition 8.8.18, as well as other indigenous plant specimens which can be relocated, are to be rescued in consultation with the above botanical specialist before vegetation clearing takes place. Such specimens are to be appropriately transplanted, including in rehabilitation initiatives, where applicable and practicable.
- 8.7.20. Further to the provisions of Condition 8.8.19 the following must be obtained:
  - 8.7.20.1. A permit in terms of the Nature and Environmental Conservation Ordinance. Ordinance 19 of 1974 from this Department for the removal and translocation of identified plant specimens; and

8.7.20.2. A permit in terms of the National Forests Act, Act 84 of 1998 for the removal and possible transiquation of protected tree species from the

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## ECONOMIC DEVELOPMENT & ENVIRONMENTAL AFFAIRS CHIEF DIRECTORATE: ENVIRONMENTAL AFFAIRS

#### Department of Water Affairs and Forestry.

- 8.7.21. Any recommendations made by the South African Heritage Resources Agency (SAHRA) in response to the Heritage Specialists findings must be incorporated into the CEMP.
- 8.7.22. Adequate preventive measures must be undertaken to avoid danger to or destruction of any archaeological sites and other resources during development of the site. This must include inspection of each individual construction site by an archaeologist prior to construction activities commencing on that site.
- 8.7.23. In the event of any potential archaeological site being encountered, all work on site will cease and a qualified archaeologist be deployed on site for investigation. Any such area to be cordoned off subject to the outcome of such investigation and subsequent consultation with the South African Heritage Resources Agency (SAHRA).
- 8.7.24. Environmental audits must be carried out on the Implementation of the CEMP referred to in condition 8.7.1 on a quarterly basis and on completion of the construction phase of the development and the results must be submitted to this Department.
- 8.7.25. Notwithstanding the provisions of any of these conditions, all mitigation measures and recommendations contained in the Addendum Environmental Report to the Final Scoping Report of November 2007 dated January 2009, submitted in support of the application, and any other documents to be read in conjunction with such report (Final Scoping Report dated November 2007) are deemed to be conditions in terms of this Record of Decision.
- 8.8. Conditions specific to the operational phase of the different components of the development
- 8.8.1. Within 6 months of the signature of the Authorisation and Record of Decision, an application must be lodged with this Department in terms of the relevant provincial legislation to have the natural area that will remain undeveloped, proclaimed as a private nature reserve.
- 8.8.2. A comprehensive Operational Environmental Management Plan (OEMP) to be compiled by a suitably qualified and experienced professional and submitted to this Department for approval / endorsement within 12 months of the date of signature of the Authorisation and Record of Decision. The OEMP must address the protection and ongoing management of the natural resources both on and off the site during the operational stages of the development with the overarching goal to ensure that undue or reasonably avoidable impacts of the proposed development are minimised and that positive impacts of the development are enhanced. The OEMP must furthermore be open-ended to allow for information gained during the monitoring of the activities on site to inform any changes to the OEMP. In this regard the OEMP must be seen as a working document to manage activities on site on an ongoing basis in an environmentally sustainable manner.

8.8.3. The OEMP must include amongst others:

8.8.3.1. Environmental goals and objectives, management actions, monitoring requirements, criteria for monitoring and remedial actions where actions are ineffective.

8.8.3.2. A comprehensive vegetation management programme:

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#### **ECONOMIC DEVELOPMENT A ENVIRONMENTAL AFFAIRS** CHIEF DIRECTORATE: ENVIRONMENTAL AFFAIRS

- 8.8.3.3. A comprehensive fauna management programme;
- 8.8.3.4. Alien plant clearing programme;
- 8.8.3.5. The control of litter;
- 8.8.3.6. Control of pets on site:
- 8.8.3.7. Fire Management Plan compiled by an appropriately qualified specialist;
- Guidelines for management of the Private Open Space component of the development that will remain undeveloped inclusive of restoration of degraded and transformed areas;
- 8.8.3.9. A comprehensive water management plan:
- 8.8.3.10. A wetlend rehabilitation and management programme (inclusive of drainage
- 8.8.3.11. A Waste Management Programme;
- 8.8.3.12. Restrictions on the use of fertilisers and pesticides;
- 8.8.3.13. A Code of Conduct incorporating general as well as environmental management rules for the operational phase of the development; and
- 8.8.3.14. Incorporation into the OEMP of any recommendations made by South African Heritage Resources Agency (SAHRA) in response to the Heritage Specialists
- 8.8.4. Information regarding the ecology of the natural areas and local archaeological sites or items must be made available to the residents through pamphlets or strategically placed notice boards.
- 8.8.5. The waste management plan contemplated in Condition 8.8.3.11 to provide for amongst others:
  - 8.8.5.1. The minimization and sorting of waste at source;
  - Consideration of the compacting of non-recoverable solid waste prior to it being transported to a registered waste disposal facility;
  - Recycling of recoverable waste; and
  - Storage of waste on site to be restricted to a maximum period of one week after which it must be transported to and disposed of at a registered waste disposal facility.
- 8.8.6. The Code of Conduct contemplated in Condition 8.8.3.13 to provide for amongst others:
  - Appropriate mechanisms to ensure that all owners / residents formally 8.8.6.1. endorse adherence to norms and standards set by such a code of conduct and the OEMP referred to In Condition 8.4.2;
  - Appropriate mechanisms to ensure that all contractors, service providers, staff (permanent and casual), as well as any other visitors to the site conduct themselves in a manner which is in keeping with the norms and standards set by the code of conduct and the OEMP referred to in Condition 8.4.2: and

Mechanisms to ensure the ongoing overseeing of and adherence to the norms and standards set by the code of conduct and OEMP.

8.8.7. Guidelines for the management of undeveloped open space areas as contemplated in Condition 8.8.3.8 to provide for the management of these areas in accordance with

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#### **SCONOMIC DEVELOPMENT & ENVIRONMENTAL AFFAIRS** CHIEF DIRECTORATE: ENVIRONMENTAL AFFAIRS

conservation principles.

- 8.8.8. Concomitant to Condition 8.8.7, a strategy to be put in place to incorporate the natural areas on the development site into a joint management strategy with the natural areas on the neighbouring Jubilee Lakes development. This must include allowing the movement of wildlife between the two areas and, where feasible, mutual assistance with plant material for rehabilitation.
- 8.8.9. The subject properties to be managed in accordance with the OEMP required in terms of Condition 8.8.2.
- 8.8.10. Concomitant to Condition 8.8.9, the to-be established HOA as provided for in Condition 8.2.11 to be responsible for the effective management of the subject properties in accordance with the OEMP required in terms of Condition 8.8.2.
- 8.8.11. The constitution of the to-be established HOA must incorporate / include management rules in line with the general code of conduct to be compiled in terms of Condition 8.8.3.13. and must subscribe to the OEMP provided for in terms of Condition 8.8.2.
- 8.8.12. Implementation of and ongoing adherence to the OEMP to be overseen by a dedicated Environmental Manager.
- 8.8.13. The OEMP to be audited on an annual basis in order to measure compliance thereof and to identify and implement appropriate corrective actions and these audit results to be submitted to this Department.

#### Key Factors that Led to the Decision

- The proposed change in land use and the proposed developments are aligned with the Jeffrey's Bay/Humansdorp Spatial Development Framework (2005) and are therefore in line with forward planning for the area.
- The Kouga Municipality has confirmed that it has sufficient capacity to provide services for the proposed development and that service provision requirements can be met, with a financial contribution to augmentation costs from the developer, subject to the necessary upgrades being in place prior to the commencement of construction.
- The potential impacts associated with the proposed development can be divided into 9.3 those associated with construction and those associated with operation thereof, respectively. These impacts have the potential to have a moderate negative impact on the local environment and its immediate surrounds. The significance of the likely environmental impacts can however, be kept within acceptable levels through the implementation of appropriate mitigation and management measures. A number of conditions have been included in this Record of Decision to this effect.
- The Department is of the opinion that the applicant, in an attempt to mitigate the negative Impacts associated with this development, has to some extent responded to the significance of the vegetation at a local level and has reduced the density (as recommended by the Spatial Development Framework) of the development in response

According to the consultant the integration of ecological constraints into the layout of the development by restricting it to the edges of this site, the judicious use of architectural

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## ECONOMIC DEVELOPMENT & ENVIRONMENTAL AFFAIRS CHIEF DIRECTORATE: ENVIRONMENTAL AFFAIRS

style, careful location of units, establishment of a wetland system, and the establishment of a private nature reserve effectively mitigate the negative impact of the development.

According to the consultant's report the site will still meet with the conservation targets of STEP after the development has been implemented. The consultant further states that the proposed development has been designed in such a way that none of the habitats present on the site will be completely lost. Therefore the fauna will be able to find similar habitat elsewhere on the site.

The Department is however not convinced that the establishment of a Private Nature Reserve for the benefit of estate property owners only and the removal of alien vegetation can be considered equitable for the loss of habitat that will result. The Department understands how the site specific conservation targets were determined, but is of the opinion that other factors such as proximity to a Provincial Nature Reserve, the fact that the vegetation is not fragmented, and its important role as a corridor, amongst others, should promote it's importance when compared with other patches of the same vegetation types in the area, and therefore this site deserves a higher local conservation status. The tradeoff suggested in the consultant's reports appears not to have quantified all gains and losses arising from the loss of good or pristine vegetation against the proposed mitigations.

Conditions have thus been included in this Record of Decision to further limit the amount of transformation that could take place within areas of high vegetation sensitivity in order to ensure that habitat loss is further restricted. It is foreseen that implementation of and compliance with such, will further serve to mitigate the impact of the proposed development on this sensitive site.

- 9.6 The impacts from increased storm water from the development, which could have the potential to exacerbate an identified problem in the greater area, can be managed by a comprehensive and properly implemented Stormwater Management Plan for the development.
- 9.7 The potential impacts that were identified and assessed by the consultant, if managed according to the measures identified in the Addendum Environmental Report to the Final Scoping Report of November 2007 (January 2009) and set as conditions in this document, should not preclude this development from taking place.

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#### **ECONOMIC DEVELOPMENT & ENVIRONMENTAL AFFAIRS**

CHIEF DIRECTORATE: ENVIRONMENTAL AFFAIRS

#### 10. Appeal

A written appeal against the decision may be lodged, in terms of Section 35(3) of the Environment Conservation Act (Act 73 of 1989), with the MEC for Economic Development and Environmental Affairs within 30 days from the date of Issue of this authorisation. The address for submission of appeal is:

Attention:

Chief Director Environmental Affairs

Department of Economic Affairs, Environment and Tourlsm

Private Bag X 0054

Bhisho 5605

Fax: 040 635 2535

e-mail: albert.mfenyana@deaet.ecape.gov.za

Only appeals on environmental grounds can be considered. All appeals should be accompanied by relevant supporting documentation.

A. STRUWIG

**ASSISTANT DIRECTOR: EIM** 

CACADU REGION

DATE: 31 March

D. GOVENDER

**DEPUTY DIRECTOR: ENVIRONMENTAL AFFAIRS** 

**CACADU REGION** 

DATE OF ISSUE: 31 MAKON 2009

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# Appendix 3: Declared Weeds and Invader Plants

Extracts from GNR.1048 of 25 May 1984: Regulations (Department Of Agriculture) as amended Notice *Government Gazette* R.2687 10029 6 December 1985 R.280 22166 30 March 2001

#### WEEDS AND INVADER PLANTS

- 15. Declaration of weeds and invader plants
- (1) Plants of the kinds specified in column 1 of Table 3 as category 1 plants are hereby declared weeds to the extent indicated in column 3 of the said Table opposite the names of the respective kinds of plants.
- (2) Plants of the kinds specified in column 1 of Table 3 as category 2 plants and as category 3 plants are hereby declared invader plants to the extent indicated in column 3 of the said Table opposite the names of the respective kinds of plants.

(Regulation 15 substituted by GNR.280 of 2001.)

15A Combating of category 1 plants

- (1) Category 1 plants may not occur on any land or inland water surface other than in biological control reserves.
- (2) A land user shall control any category 1 plants that occur on any land or inland water surface in contravention of the provisions of sub-regulation (1) by means of the methods prescribed in regulation 15E.

- (3) No person shall, except in or for purposes of a biological control reserve:
- (a) establish, plant, maintain, multiply or propagate category 1 plants;
- (b) import or sell propagating material of category 1 plants or any category1 plants;
- (c) acquire propagating material of category 1 plants or any category 1 plants.
- (4) The executive officer may, on good cause shown in writing by the land user, grant written exemption from compliance with the requirements of sub-regulation (1) on such conditions as the executive officer may determine in each case.

(Regulation 15A inserted by GNR.280 of 2001.)

- 15B Combating of category 2 plants
- (1) Category 2 plants may not occur on any land or inland water surface other than a demarcated area or a biological control reserve.
- (2)(a) The executive officer may on application in writing demarcate an area as an area where category 2 plants may occur, be established and be maintained.
  - An area in respect of which a water use licence for stream flow reduction activities has been issued in terms of section 36 of the National Water Act, 1998 (Act No. 36 of 1998) shall be deemed to be a demarcated area.
- (3) The executive officer shall demarcate an area for the occurrence, establishment and maintenance of category 2 plants only if:

- (a) the category 2 plants in the area are cultivated under controlled circumstances; and
- (b) the land user concerned has been authorised to use water in terms of the National Water Act, 1998 (Act No. 36 of 1998); and
- (c) the category 2 plants or products of category 2 plants in the area are demonstrated to primarily serve a commercial purpose, use as a woodlot, shelter belt, building material, animal fodder, soil stabilisation, medicinal or other beneficial function that the executive officer may approve; and
- (d) all reasonable steps are taken to curtail the spreading of propagating material of the category 2 plants outside the demarcated areas.
- (4) When an area is demarcated for the occurrence, establishment and maintenance of category 2 plants the executive officer may impose such additional conditions as may reasonably be deemed necessary to keep the category 2 plants in the area in check.
- (5) No person shall sell propagating material of category 2 plants or any category 2 plants to another person unless such other person is a land user of a demarcated area or of a biological control reserve.
- (6) No person shall acquire propagating material of category 2 plants or any category 2 plants unless such material or such plants are intended for use in a demarcated area or in a biological control reserve.
- (7) Propagating material of category 2 plants or category 2 plants shall only be imported or sold in accordance with the provisions of the Plant Improvement Act, 1976 (Act No. 53 of 1976), the Agricultural Pests Act, 1983 (Act No. 36 of 1983) and the environment conservation regulations.
- (8) A land user shall control any category 2 plants that occur on any land or inland water surface in contravention of the provisions of subregulation (1) by means of the methods prescribed in regulation 15E.
- (9) Unless authorised thereto in terms of the National Water Act, 1998 (ActNo. 36 of 1998), no land user shall allow category 2 plants to occur

- within 30 meters of the 1:50 year flood line of a river, stream, spring, natural channel in which water flows regularly or intermittently, lake, dam or wetland.
- (10) The executive officer may, on good cause shown in writing by the land user, grant written exemption from compliance with one or more of the requirements of sub-regulations (1), (3), (5), (6), (8) and (9) on such conditions as the executive officer may determine in each case.

(Regulation 15B inserted by GNR.280 of 2001.)

15C Combating of category 3 plants

- (1) Category 3 plants shall not occur on any land or inland water surface other than in a biological control reserve.
- (2) Subject to the provisions of sub-regulation (3), the provisions of sub-regulation (1) shall not apply in respect of category 3 plants already in existence at the time of the commencement of these regulations.
- (3) (a) No land user shall allow category 3 plants to occur within 30 meters of the 1:50 year flood line of a river, stream, spring, natural channel in which water flows regularly or intermittently, lake, dam or wetland.
- (b) The executive officer may impose such additional conditions as may reasonably be deemed necessary with regard to category 3 plants already in existence at the time of the commencement of these regulations.
- (c) A land user must take all reasonable steps to curtail the spreading of propagating material of category 3 plants.
- (d) The executive officer may, after consultation with the land user, issue a direction in terms of section 7 of the Act that category 3 plants in existence at the time of the commencement of these regulations must be controlled by means of the measures prescribed in regulation 15F.

- (4) No person shall, except in or for purposes of a biological control reserve:
- (a) plant, establish, maintain, multiply or propagate category 3 plants;
- (b) import or sell propagating material of category 3 plants or any category3 plants;
- (c) acquire propagating material of category 3 plants or any category 3 plants.
- (5) The executive officer may, on good cause shown in writing by the land user, grant written exemption from compliance with one or more of the requirements of sub-regulations (1), (3) and (4) on such conditions as the executive officer may determine in each case.

(Regulation 15C inserted by GNR.280 of 2001.)

15D Designation of biological control reserves

- (1) The executive officer may on application in writing designate an area as a biological control reserve.
- (2) The executive officer shall designate an area as a biological control reserve only if:
- the area concerned is used for the breeding of biological control agentsby a biological control expert; and
- (b) no other measures that may destroy or render the biological control ineffective are applied in that area; and
- (c) the area concerned serves as a refuge from where biological control agents can move or be distributed to other infestations of category 1, 2 and 3 plants.

(Regulation 15D inserted by GNR.280 of 2001.)
15E Methods of control

- (1) Where category 1, 2 or 3 plants occur contrary to the provisions of these regulations, a land user shall control such plants by means of one or more of the following methods of control as is appropriate for the species concerned and the ecosystem in which it occurs:
- (a) uprooting, felling, cutting or burning;
- (b) treatment with a weed killer that is registered for use in connection with such plants in accordance with the directions for the use of such a weed killer;
- (c) biological control carried out in accordance with the stipulations of the Agricultural Pests Act, 1983 (Act No. 38 of 1983), the Environment Conservation Act, 1989 (Act No. 73 of 1989) and any other applicable legislation;
- (d) any other method of treatment recognised by the executive officer that has as its object the control of the plants concerned, subject to the provisions of sub-regulation (4);
- (e) a combination of one or more of the methods prescribed in paragraphs (a), (b), (c), and (d), save that biological control reserves and areas where biological control agents are effective shall not be disturbed by other control methods to the extent that the agents are destroyed or become ineffective.
- (2) The methods contemplated in sub-regulation (1) shall also be applied with regard to the propagating material and the re-growth of category 1, 2 and 3 plants in order to prevent such plants from forming seed or reestablishing in any manner.
- (3) The performance of an act of control is not in itself proof that the objects of the control methods have been achieved and follow-up operations are mandatory to achieve the appropriate level of combating.
- (4) Where uncertainty exists about the presence or efficacy of any biological control agent, a biological control expert shall be consulted.

(5) Any action taken to control category 1, 2 and 3 plants shall be executed with caution and in a manner that will cause the least possible damage to the environment.

(Regulation 15D inserted by GNR.280 of 2001.)

15F Application of other laws

Nothing contained in this regulation shall derogate in any way from any obligation imposed on any land user in term of any other law.

#### 16. Indicators of bush encroachment

- (1) Indigenous plants of the kinds specified in column 1 of Table 4 are regarded as indicator plants indicating bush encroachment in the areas specified in column 2 of the said Table opposite the names of the respective kinds of plants.
- (2) A land user of an area in which natural vegetation occurs and that contains communities of indicator plants shall follow practices to prevent the deterioration of natural resources and to combat bush encroachment where it occurs.
- (3) One or more of the following practices shall be followed with regard to communities of indicator plants contemplated in sub-regulation (2) in order to remove the cause of the deterioration of the natural resources and to improve and maintain the production potential of the natural pastoral land:
- (a) uprooting, felling or cutting;
- (b) treatment with a weed killer that is registered for use in connection with such plants in accordance with the directions for the use of such a weed killer;
- (c) the application of control measures regarding the utilisation and protection of veld in terms of regulation 9;

- (d) the application of control measures regarding livestock reduction or removal of animals in terms of regulations 10 and 11;
- (e) any other method or strategy that may be applicable and that is specified by the executive officer by means of a directive.

(Regulation 16 substituted by GNR.280 of 2001.)

### > Table 5: Declared Weeds And Invader Plants

| Soort plant / Kind of plant |                     | Tipe /      | Kategorie/ | Spesiale       |
|-----------------------------|---------------------|-------------|------------|----------------|
|                             |                     | Туре        | Category   | voorwaardes /  |
|                             |                     |             |            | Special        |
|                             |                     |             |            | conditions     |
| Botaniese naam /            | Gewone naam /       |             |            |                |
| Botanical name              | Common name         |             |            |                |
| Kolom 1 / Column 1          |                     | Kolom 2/    | Kolom 3 /  | Kolom 4 /      |
|                             |                     | Column      | Column 3   | Column 4       |
|                             |                     | 2           |            |                |
| Acacia baileyana F. Muell.  | Bailey-se-wattel /  | Indringer / | 3          | Kyk / See      |
|                             | Bailey's wattle     | Invader     |            | subreg.        |
|                             |                     |             |            | 15.C(7)(c)     |
| Acacia cyclops A. Cunn. ex  | Rooikrans / Red eye | Indringer / | 2          | Kyk / See      |
| G. Don                      |                     | Invader     |            | subreg.        |
|                             |                     |             |            | 15.C(7)(c)     |
| Acacia dealbata Link        | Silwerwattel /      | Indringer / | 2          | Kategorie 1    |
|                             | Silver wattle       | Invader     |            | plant in Wes-  |
|                             |                     |             |            | Kaap/ Category |
|                             |                     |             |            | 1 plant in     |
|                             |                     |             |            | Western Cape   |
|                             |                     |             |            | Kyk / See      |
|                             |                     |             |            | subreg.        |
|                             |                     |             |            | 15.C(7)(c)     |

| Soort plant / Kind of plant  |                     | Tipe /      | Kategorie/ | Spesiale         |
|------------------------------|---------------------|-------------|------------|------------------|
|                              |                     | Туре        | Category   | voorwaardes /    |
|                              |                     |             |            | Special          |
|                              |                     |             |            | conditions       |
| Botaniese naam /             | Gewone naam /       |             |            |                  |
| Botanical name               | Common name         |             |            |                  |
| Kolom 1 / Column 1           |                     | Kolom 2 /   | Kolom 3 /  | Kolom 4 /        |
|                              |                     | Column      | Column 3   | Column 4         |
|                              |                     | 2           |            |                  |
| Acacia decurrens (J.C.       | Groenwattel /       | Indringer / | 2          | Kyk / See        |
| Wendl.) Willd.               | Green wattle        | Invader     |            | subreg.          |
|                              |                     |             |            | 15.C(7)(c)       |
| Acacia elata A. Cunn. ex     | Peperboomwattel /   | Indringer / | 3          |                  |
| Benth.                       | Pepper tree wattle  | Invader     |            |                  |
| (A. terminalis misapplied in |                     |             |            |                  |
| S.A.)                        |                     |             |            |                  |
| Acacia implexa Benth.        | Screw-pod wattle    | Onkruid /   | 1          |                  |
|                              |                     | Weed        |            |                  |
| Acacia longifolia (Andr.)    | Langblaarwattel /   | Onkruid /   | 1          |                  |
| Willd.                       | Long-leaved wattle  | Weed        |            |                  |
| Acacia mearnsii De Wild.     | Swartwattel / Black | Indringer / | 2          | Kategorie 1      |
|                              | wattle              | Invader     |            | plant in Suid    |
|                              |                     |             |            | Afrika, behalwe  |
|                              |                     |             |            | KwaZulu-Natal    |
|                              |                     |             |            | en Mpumalanga    |
|                              |                     |             |            | waar dit         |
|                              |                     |             |            | kommersieël      |
|                              |                     |             |            | verbou word /    |
|                              |                     |             |            | Category 1 plant |
|                              |                     |             |            | South Africa,    |
|                              |                     |             |            | except in        |
|                              |                     |             |            | KwaZulu-Natal    |
|                              |                     |             |            | and              |
|                              |                     |             |            | Mpumalanga       |

| ·                             |                         | Tipe /      | Kategorie/ | -                |
|-------------------------------|-------------------------|-------------|------------|------------------|
|                               |                         | Туре        | Category   | voorwaardes /    |
|                               |                         |             |            | Special          |
|                               |                         |             |            | conditions       |
| Botaniese naam /              | Gewone naam /           |             |            |                  |
| Botanical name                | Common name             |             |            |                  |
| Kolom 1 / Column 1            |                         | Kolom 2 /   | Kolom 3 /  | Kolom 4 /        |
|                               |                         | Column      | Column 3   | Column 4         |
|                               |                         | 2           |            |                  |
|                               |                         |             |            | where it is used |
|                               |                         |             |            | commercially     |
| Acacia melanoxylon R. Br.     | Australiese swarthout / | Indringer / | 2          | Kyk / See        |
|                               | Australian blackwood    | Invader     |            | subreg.          |
|                               |                         |             |            | 15.C(7)(c)       |
| Acacia paradoxa DC.           | Kangaroo wattle         | Onkruid /   | 1          |                  |
| (=A. armata R. Br.)           |                         | Weed        |            |                  |
| Acacia podalyriifolia A       | Vaalmimosa /            | Indringer / | 3          |                  |
| Cunn.                         | Pearl acacia            | Invader     |            |                  |
| Acacia pycnantha Benth.       | Gouewattel /            | Onkruid /   | 1          |                  |
|                               | Golden wattle           | Weeds       |            |                  |
| Acacia saligna (Labill.) H.L. | Port Jackson /          | Onkruid /   | 1          |                  |
| Wendl.                        | Port Jackson willow     | Weeds       |            |                  |
| Agave sisalana Perrine        | Garingboom / Sisal      | Indringer / | 2          |                  |
|                               | hemp, Sisal             | Invader     |            |                  |
| Alhagi maurorum Medik.        | Kameeldoringbos /       | Onkruid /   | 1          |                  |
| (=A. camelorum Fisch.)        | Camel thorn bush        | Weed        |            |                  |
| Anredera cordifolia           | Madeira vine, Bridal    | Onkruid /   | 1          |                  |
| (Tenore) Steen.               | wreath                  | Weed        |            |                  |
| (A. baselloides (H.B.K.)      |                         |             |            |                  |
| Baill. Misapplied in South    |                         |             |            |                  |
| Africa}                       |                         |             |            |                  |
| Araujia sericifera Brot.      | Motvanger / Moth        | Onkruid /   | 1          |                  |

| Soort plant / Kind of plant  |   | Tipe /<br>Type           | Kategorie/<br>Category | Spesiale<br>voorwaardes /<br>Special<br>conditions |
|--|---|--------------------------|------------------------|--|
| Botaniese naam /<br>Botanical name   | Gewone naam /<br>Common name                            |                          |                        |  |
| Kolom 1 / Column 1   |   | Kolom 2 /<br>Column<br>2 | Kolom 3 /<br>Column 3  | Kolom 4 /<br>Column 4                              |
|  | catcher   | Weed                     |                        |  |
| Argemone ochroleuca Sweet subsp ochroleuca                                 | Witblom bloudissel /<br>White flowered<br>Mexican poppy | Onkruid /<br>Weed        | 1                      |  |
| Arundo donax L.  | Spaanse riet /<br>Giant reed, Spanish<br>reed           | Indringer /<br>Invader   | 3                      |  |
| Atriplex lindleyi Moq.<br>subsp. inflata Wilson<br>(Muell.)                | Blasiesoutbos /<br>Sponge-fruit saltbush                | Indringer /<br>Invader   | 3                      |  |
| Atriplex nummularia<br>Lindley subsp. Nummularia                           | Oumansoutbos /<br>Old man saltbush                      | Indringer /<br>Invader   | 2                      |  |
| Azolla filiculoides Lam.   | Rooiwatervaring /<br>Azolla, Red water fern             | Onkruid /<br>Weeds       | 1                      | Kyk / See<br>subreg.<br>15.C(7)(c)                 |
| Caesalpinia decapetala (Roth) Alston (= C. sepiaria Roxb.)                 | Kraaldoring /<br>Mauritius thorn                        | Onkruid /<br>Weed        | 1                      |  |
| Campuloclinium macrocephalum (Less.) DC. (=Eupatorium macrocephalum Less.) |   | Onkruid /<br>Weed        | 1                      |  |
| Cannabis sativa L.   | Slegs hemp, nie<br>dagga nie / Hemp                     | Indringer./<br>Invader   | 2                      | Beheerde<br>aanplanting/                           |

| ·                          |                        | Tipe /<br>Type | Kategorie/<br>Category | Spesiale<br>voorwaardes /<br>Special<br>conditions |
|----------------------------|------------------------|----------------|------------------------|--|
| Botaniese naam /           | Gewone naam /          |                |                        |  |
| Botanical name             | Common name            |                |                        |  |
| Kolom 1 / Column 1         |                        | Kolom 2 /      | Kolom 3 /              | Kolom 4 /  |
|                            |                        | Column         | Column 3               | Column 4   |
|                            |                        | 2              |                        |  |
|                            | only, not dagga        |                |                        | Controlled   |
|                            |                        |                |                        | cultivation  |
| Cardaria draba (L.) Desv.  | Peperbos / Pepper-     | Onkruid /      | 1                      |  |
|                            | cress, Hoary cardaria, | Weed           |                        |  |
|                            | White top              |                |                        |  |
| Cardiospermum              | Blaasklimop /          | Onkruid /      | 1                      |  |
| grandiflorum Swartz        | Balloon vine           | Weed           |                        |  |
| Casuarina                  | Kasuarisboom /         | Indringer /    | 2                      | Slegs vir gebruik                                  |
| cunninghamiana Miq.        | Beefwood               | Invader        |                        | as windbrekers                                     |
|                            |                        |                |                        | en nie vir duin                                    |
|                            |                        |                |                        | stabilisasie nie/                                  |
|                            |                        |                |                        | Only for use as                                    |
|                            |                        |                |                        | windbreakers,                                      |
|                            |                        |                |                        | not for dune                                       |
|                            |                        |                |                        | stabilisation                                      |
| Casuarina equisetifolia L. | Perdestertboom /       | Indringer /    | 2                      | Slegs vir gebruik                                  |
|                            | Horsetail tree         | Invader        |                        | as windbrekers                                     |
|                            |                        |                |                        | en nie vir duin                                    |
|                            |                        |                |                        | stabilisasie nie /                                 |
|                            |                        |                |                        | Only for use as                                    |
|                            |                        |                |                        | windbreakers,                                      |
|                            |                        |                |                        | not for dune                                       |
|                            |                        |                |                        | stabilisation                                      |
| Cereus jamacaru DC.        | Nagblom / Queen of     | Onkruid /      | 1                      |  |
| (C. peruvianus misapplied  | the Night              | Weed           |                        |  |

| Soort plant / Kind of plant  |  | Tipe /<br>Type           | Kategorie/<br>Category | Spesiale<br>voorwaardes /<br>Special<br>conditions |
|--|--|--------------------------|------------------------|--|
| Botaniese naam /<br>Botanical name   | Gewone naam /<br>Common name                                     |                          |                        |  |
| Kolom 1 / Column 1   |  | Kolom 2 /<br>Column<br>2 | Kolom 3 /<br>Column 3  | Kolom 4 /<br>Column 4                              |
| in S.A)  |  |                          |                        |  |
| Cestrum aurantiacum<br>Lindl.  | Oranjesestrum /<br>Yellow or Orange<br>cestrum                   | Onkruid /<br>Weed        | 1                      |  |
| Cestrum laevigatum<br>Schlechtd.   | Inkbessie / Inkberry   | Onkruid /<br>Weed        | 1                      |  |
| Cestrum parqui L'Hérit   | Inkbessie / Chilean<br>cestrum                                   | Onkruid /<br>Weed        | 1                      |  |
| Chromolaena odorata (L.) R.M. King & H. Robinson (=Eupatorium odoratum L.) | Paraffienbos,<br>Chromolaena / Triffid<br>weed, Chromolaena      | Onkruid /<br>Weed        | 1                      |  |
| Cirsium vulgare (Savi) Ten.<br>(=C. lanceolatum Scop.)                     | Skotse dissel,<br>Speerdissel / Scotch<br>thistle, Spear thistle | Onkruid /<br>Weed        | 1                      |  |
| Convolvulus arvensis L.  | Akkerwinde, Klimop /<br>Field bindweed, Wild<br>morning-glory    | Onkruid /<br>Weed        | 1                      |  |
| Cortaderia jubata (Lem.)<br>Stapf  | Pampasgras / Pampas<br>grass                                     | Onkruid /<br>Weed        | 1                      |  |
| Cortaderia selloana<br>(Schult.) Aschers. &<br>Graebn.                     | Pampasgras,<br>Silwergras / Pampas<br>grass                      | Onkruid /<br>Weed        | 1                      |  |
| Cotoneaster franchetii   | Dwergmispel /  | Indringer /              | 3                      |  |

|                           |                         | Tipe /      | Kategorie/ | -             |
|---------------------------|-------------------------|-------------|------------|---------------|
|                           |                         | Type        | Category   | voorwaardes / |
|                           |                         |             |            | Special       |
|                           |                         | 1           |            | conditions    |
| Botaniese naam /          | Gewone naam /           |             |            |               |
| Botanical name            | Common name             |             |            |               |
| Kolom 1 / Column 1        |                         | Kolom 2/    | Kolom 3 /  | Kolom 4 /     |
|                           |                         | Column      | Column 3   | Column 4      |
|                           |                         | 2           |            |               |
| Bois.                     | Cotoneasters            | Invader     |            |               |
| Cotoneaster pannosus      | Silwerdwergmispel /     | Indringer / | 3          |               |
| Franch.                   | Silver-leaf cotoneaster | Invader     |            |               |
| Cuscuta campestris Yunck. | Gewone dodder /         | Onkruid /   | 1          |               |
|                           | Common dodder           | Weed        |            |               |
| Cuscuta suaveolens Ser.   | Luserndodder /          | Onkruid /   | 1          |               |
|                           | Lucerne dodder          | Weed        |            |               |
| Cytisus monspessulanus    | Montpellier broom       | Onkruid /   | 1          |               |
| L.                        |                         | Weed        |            |               |
| (=C. candicans (L.)DC.,   |                         |             |            |               |
| Genista monspessulana     |                         |             |            |               |
| (L.) L. Johnson)          |                         |             |            |               |
| Datura ferox L.           | Grootstinkblaar /       | Onkruid /   | 1          |               |
|                           | Large thorn apple       | Weed        |            |               |
| Datura innoxia Mill.      | Harige stinkblaar /     | Onkruid /   | 1          |               |
|                           | Downy thorn apple       | Weed        |            |               |
| Datura stramonium L.      | Gewone stinkblaar /     | Onkruid /   | 1          |               |
|                           | Common thorn apple      | Weed        |            |               |
| Echinopsis spachiana      | Orrelkaktus /Torch      | Onkruid /   | 1          |               |
| (Lem.) Fiedr. & Rowley    | cactus                  | Weed        |            |               |
| {=Trichocereus spachianus |                         |             |            |               |
| (Lem.) Riccob.}           |                         |             |            |               |
| Echium plantagineum L. (= | Pers echium /           | Onkruid /   | 1          |               |

| Soort plant / Kind of plant                                   |  | Tipe /<br>Type           | Kategorie/<br>Category | Spesiale<br>voorwaardes /<br>Special<br>conditions |
|---|--|--------------------------|------------------------|--|
| Botaniese naam /<br>Botanical name                            | Gewone naam /<br>Common name                 |                          |                        |  |
| Kolom 1 / Column 1  | oommon name                                  | Kolom 2 /<br>Column<br>2 | Kolom 3 /<br>Column 3  | Kolom 4 /<br>Column 4                              |
| E lycopsis L.)  | Patterson's curse                            | Weed                     |                        |  |
| Echium vulgare L.   | Blou – echium / Blue<br>echium               | Onkruid /<br>Weed        | 1                      |  |
| Egeria densa Planch.<br>(= Elodea densa (Planch.)<br>Casp.    | Waterpes / Ditch<br>moss, Water thyme        | Onkruid /<br>Weed        | 1                      |  |
| Eichhornia crassipes<br>(Mart.) Solms-Laub.                   | Waterhiasint / Water<br>Hyacinth             | Onkruid /<br>Weed        | 1                      |  |
| Elodea canadensis<br>Michaux                                  | Canadian water weed                          | Onkruid /<br>Weed        | 1                      |  |
| Eucalyptus camaldulensis<br>Dehnh.                            | Rooibloekom / Red river gum                  | Indringer /<br>Invader   | 2                      | Kyk / See<br>subreg.<br>15.C(7)(c)                 |
| Eucalyptus cladocalyx F.<br>Muell.                            | Suikerbloekom /Sugar<br>gum                  | Indringer /<br>Invader   | 2                      | Kyk / See<br>subreg.<br>15.C(7)(c)                 |
| Eucalyptus grandis Hill ex<br>Maid<br>(E. saligna Sm. (p.p.)) | Salignabloekom /<br>Saligna gum, Rose<br>gum | Indringer /<br>Invader   | 2                      | Kyk / See<br>subreg.<br>15.C(7)(c)                 |
| Eucalyptus lehmannii<br>(Schauer) Benth.                      | Spinnekopbloekom /<br>Spider gum             | Indringer /<br>Invader   | 3                      |  |
| Eucalyptus paniculata Sm.                                     | Grysysterbasbloekom<br>/ Grey ironbark       | Indringer /<br>Invader   | 2                      | Kyk / See<br>subreg.                               |

| ·                         |                       | Tipe /<br>Type | Kategorie/<br>Category | Spesiale<br>voorwaardes /<br>Special<br>conditions |
|---------------------------|-----------------------|----------------|------------------------|--|
| Botaniese naam /          | Gewone naam /         | <b>'</b>       |                        |  |
| Botanical name            | Common name           |                |                        |  |
| Kolom 1 / Column 1        |                       | Kolom 2 /      | Kolom 3 /              | Kolom 4 /  |
|                           |                       | Column         | Column 3               | Column 4   |
|                           |                       | 2              |                        |  |
|                           |                       |                |                        | 15.C(7)(c)   |
| Eucalyptus sideroxylon A. | Swartysterbasbloekom  | Indringer /    | 2                      | Kyk / See  |
| Cunn. ex Woolls           | / Black ironbark, Red | Invader        |                        | subreg.  |
|                           | ronbark               |                |                        | 15.C(7)(c)   |
| Gleditsia triacanthos L.  | Amerikaanse           | Indringer /    | 2                      |  |
|                           | driedoring,           | Invader        |                        |  |
|                           | Soetpeulboom /        |                |                        |  |
|                           | Honey locust, Sweet   |                |                        |  |
|                           | locust                |                |                        |  |
| Hakea drupacea (Gaertn.f) | Soethakea / Sweet     | Onkruid /      | 1                      |  |
| Roemer & Schultes (=H.    | hakea                 | Weed           |                        |  |
| suaveolens R. Br.)        |                       |                |                        |  |
| Hakea gibbosa (Sm.) Cav.  | Harige hakea / Rock   | Onkruid /      | 1                      |  |
|                           | hakea                 | Weed           |                        |  |
| Hakea sericea Schrad.     | Syerige hakea / Silky | Onkruid /      | 1                      |  |
|                           | hakea                 | Weed           |                        |  |
| Harrisia martinii (Lab.)  | Toukaktus, Harrisia   | Onkruid /      | 1                      |  |
| Britton                   | kaktus /Moon cactus,  | Weed           |                        |  |
|                           | Harrisia cactus       |                |                        |  |
| Hypericum perforatum L.   | Johanneskruid / St.   | Indringer /    | 2                      | Beheerde   |
|                           | John's wort, Tipton   | Invader        |                        | aanplanting/                                       |
|                           | weed                  |                |                        | Controlled   |
|                           |                       |                |                        | cultivation  |
| Ipomoea indica (Burm.f.)  | Purperwinde / Morning | Indringer /    | 3                      |  |

| Soort plant / Kind of plant |                       | Tipe /      | Kategorie/ | Spesiale      |
|-----------------------------|-----------------------|-------------|------------|---------------|
|                             |                       | Туре        | Category   | voorwaardes / |
|                             |                       |             |            | Special       |
|                             |                       |             |            | conditions    |
| Botaniese naam /            | Gewone naam /         |             |            |               |
| Botanical name              | Common name           |             |            |               |
| Kolom 1 / Column 1          |                       | Kolom 2 /   | Kolom 3 /  | Kolom 4 /     |
|                             |                       | Column      | Column 3   | Column 4      |
|                             |                       | 2           |            |               |
| Merr. (=1. Congesta R. Br.) | glory                 | Invader     |            |               |
| lpomoea purpurea (L.)       | Purperwinde / Morning | Indringer / | 3          | ?             |
| Roth                        | glory                 | Invader     |            |               |
| Jacaranda mimosifolia D.    | Jakaranda /           | Indringer / | 3          | Kyk / See     |
| Don                         | Jacaranda             | Invader     |            | subreg.       |
|                             |                       |             |            | 15.C(7)(c)    |
| Lantana camara L. en        | Lantana / Lantana,    | Onkruid /   | 1          |               |
| enige entiteit wat deels of | Tickberry             | Weed        |            |               |
| geheel ontstaan het uit die |                       |             |            |               |
| Lantana camara kompleks     |                       |             |            |               |
| deur verbastering of        |                       |             |            |               |
| seleksie op natuurlike of   |                       |             |            |               |
| kunsmatige wyse / and any   |                       |             |            |               |
| entity which has partly or  |                       |             |            |               |
| wholly been derived from    |                       |             |            |               |
| the <i>Lantana camara</i>   |                       |             |            |               |
| complex by means of         |                       |             |            |               |
| hybridisation or selection  |                       |             |            |               |
| under natural or artificial |                       |             |            |               |
| conditions                  |                       |             |            |               |
| Leptospermum laevigatum     | Australiese mirt /    | Onkruid /   | 1          |               |
| (Gaertn.) F. Muell.         | Australian myrtle     | Weed        |            |               |
| Leucaena leucocephala       | Reuse wattel /        | Indringer / | 2          | Kyk / See     |
| (Lam.) De Wit               | Leucaena              | Invader     |            | subreg.       |
|                             |                       |             |            | 15.C(7)(c)    |

| ·   |  | Tipe /<br>Type           | Kategorie/<br>Category | Spesiale<br>voorwaardes /<br>Special<br>conditions |
|---|--|--------------------------|------------------------|--|
| Botaniese naam /<br>Botanical name                          | Gewone naam / Common name                              |                          |                        |  |
| Kolom 1 / Column 1  | Common name  | Kolom 2 /<br>Column<br>2 | Kolom 3 /<br>Column 3  | Kolom 4 /<br>Column 4                              |
| <i>Ligustrum japonicum</i><br>Thunb.                        | Japanese liguster /<br>Japanese wax –<br>leaved privet | Indringer /<br>Invader   | 3                      |  |
| Ligustrum lucidum Ait.                                      | Chinese liguster / Chinese wax – leaved privet         | Indringer /<br>Invader   | 3                      |  |
| Ligustrum ovalifolium<br>Hassk.                             | Kaliforniese liguster / Californian privet             | Indringer /<br>Invader   | 3                      |  |
| Ligustrum sinense Lour.                                     | Chinese liguster / Chinese privet                      | Indringer /<br>Invader   | 3                      |  |
| Ligustrum vulgare L.  | Gewone liguster / Common privet                        | Indringer /<br>Invader   | 3                      |  |
| Litsea glutinosa (Lour.) C.B. Robinson (=L. sebifera Pers.) | Indiese lourier /Indian<br>laurel                      | Onkruid /<br>Weed        | 1                      |  |
| Lythrum salicaria L.  | Purple loosestrife                                     | Onkruid /<br>Weed        | 1                      |  |
| Macfadyena unguis-cati (L.) A. Gentry                       | Katteklouranker /Cat's claw creeper                    | Onkruid /<br>Weed        | 1                      |  |
| Melia azedarach L.  | Maksering, Bessieboom / "Syringa", Persian lilac       | Indringer /<br>Invader   | 3                      | Kyk / See<br>subreg.<br>15.C(7)(c)                 |
| Metrosideros excelsa  | Nieu-Seelandse   | Indringer /              | 3                      |  |

|                             |                       | Tipe /<br>Type | Kategorie/<br>Category | Spesiale<br>voorwaardes /<br>Special<br>conditions |
|-----------------------------|-----------------------|----------------|------------------------|--|
| Botaniese naam /            | Gewone naam /         |                |                        |  |
| Botanical name              | Common name           |                |                        |  |
| Kolom 1 / Column 1          |                       | Kolom 2 /      |                        | Kolom 4 /  |
|                             |                       | Column<br>2    | Column 3               | Column 4   |
| Soland. Ex. Gaertn.         | perdestert / New      | Invader        |                        |  |
| (=M. tomentosa A. Rich.)    | Zealand bottle brush  |                |                        |  |
| Mimosa pigra L.             | Giant sensitive plant | Onkruid /      | 1                      |  |
|                             |                       | Weed           |                        |  |
| Morus alba L.               | Witmoerbei, Gewone    | Indringer /    | 3                      | Kyk / See  |
|                             | moerbei / White       | Invader        |                        | subreg.  |
|                             | mulberry, Common      |                |                        | 15.C(7)(c)   |
|                             | mulberry              |                |                        |  |
| Myoporum tenuifolium        | Manatoka              | Indringer /    | 2                      |  |
| Forst. F.                   |                       | Invader        |                        |  |
| (M. acuminatum              |                       |                |                        |  |
| misapplied in S.A.)         |                       |                |                        |  |
| Myriophyllum aquaticum      | Waterduisendblaar /   | Onkruid /      | 1                      |  |
| (Vell.) Verdc.              | Parrot's feather      | Weed           |                        |  |
| Myriophyllum spicatum L.    | Spiked water-milfoil  | Onkruid /      | 1                      |  |
|                             |                       | Weed           |                        |  |
| Nassella tenuissima (Trin.) | Witpolgras / White    | Onkruid /      | 1                      |  |
| Barkworth                   | tussock               | Weed           |                        |  |
| (=Stipa tenuissima Trin.)   |                       |                |                        |  |
| Nassella trichotoma (Nees)  | Nassella polgras /    | Onkruid /      | 1                      |  |
| Hack. ex Arech.             | Nassella tussock      | Weed           |                        |  |
| (=Stipa trichotoma Nees)    |                       |                |                        |  |
| Nerium oleander L.          | Selonsroos / Oleander | Onkruid /      | 1                      | Steriele kultivars                                 |
|                             |                       | Weed           |                        | uitgesluit /                                       |

|   |  | Tipe /<br>Type           | Kategorie/<br>Category | Spesiale<br>voorwaardes /<br>Special<br>conditions   |
|---|--|--------------------------|------------------------|--|
| Botaniese naam /<br>Botanical name                                | Gewone naam /<br>Common name   |                          |                        |  |
| Kolom 1 / Column 1  |  | Kolom 2 /<br>Column<br>2 | Kolom 3 /<br>Column 3  | Kolom 4 /<br>Column 4  |
|   |  |                          |                        | Excluding<br>sterile, double-<br>flowered<br>cultivars   |
| Nicotiana glauca R.C.<br>Grah.                                    | Wildetabak / Wild<br>tobacco   | Onkruid /<br>Weed        | 1                      |  |
| Opuntia aurantiaca Lindl.   | Litjieskaktus / Jointed cactus   | Onkruid /<br>Weed        | 1                      |  |
| Opuntia exaltata Berger   | Langdoringkaktus /<br>Long spine cactus  | Onkruid /<br>Weed        | 1                      |  |
| Opuntia ficus-indica (L.) Mill.                                   | Boereturksvy,<br>Grootdoringturksvy /<br>Mission prickly pear,<br>Sweet prickly pear | Onkruid /<br>Weed        | 1                      | Uitgesonderd alle doringlose cultivars en seleksies / Excluding all spineless cultivars and selections |
| Opuntia humifusa (Raf.) Raf. (= O. compressa (Salisb.) (Macbride) | Large flowered prickly pear, Creeping prickly pear                                   | Onkruid /<br>Weed        | 1                      |  |
| Opuntia imbricata (Haw.)<br>DC. {=Cylindropuntia                  | Imbrikaatkaktus,<br>Kabelturksvy /   | Onkruid /<br>Weed        | 1                      |  |

| Soort plant / Kind of plant |                         | Tipe /    | Kategorie/ | Spesiale      |
|-----------------------------|-------------------------|-----------|------------|---------------|
|                             |                         | Туре      | Category   | voorwaardes / |
|                             |                         |           |            | Special       |
|                             |                         |           |            | conditions    |
| Botaniese naam /            | Gewone naam /           |           |            |               |
| Botanical name              | Common name             |           |            |               |
| Kolom 1 / Column 1          | •                       | Kolom 2 / | Kolom 3 /  | Kolom 4 /     |
|                             |                         | Column    | Column 3   | Column 4      |
|                             |                         | 2         |            |               |
| imbricata (Haw.) Knuth}     | Imbricate cactus,       |           |            |               |
|                             | Imbricate prickly pear  |           |            |               |
| Opuntia lindheimeri         | Klein                   | Onkruid / | 1          |               |
| Engelm.                     | rondeblaarturksvy/      | Weed      |            |               |
|                             | Small round-leaved      |           |            |               |
|                             | prickly pear            |           |            |               |
| Opuntia monacantha Haw.     | Suurturksvy,            | Onkruid / | 1          |               |
| (=O <i>vulgari</i> s Mill.) | Luisiesturksvy /        | Weed      |            |               |
|                             | Cochineal prickly pear, |           |            |               |
|                             | Drooping prickly pear   |           |            |               |
| Opuntia rosea DC.           | Roseakaktus / Rosea     | Onkruid / | 1          |               |
|                             | cactus                  | Weed      |            |               |
| Opuntia spinulifera Salm-   | Blouturksvy, Groot      | Onkruid / | 1          |               |
| Dyck                        | rondeblaar turksvy /    | Weed      |            |               |
|                             | Saucepan cactus,        |           |            |               |
|                             | Large roundleaved       |           |            |               |
|                             | prickly pear            |           |            |               |
| Opuntia stricta (Haw.)      | Suurturksvy / Pest      | Onkruid / | 1          |               |
| Haw.                        | pear of Australia       | Weed      |            |               |

| Soort plant / Kind of plant | Tipe /<br>Type |  | Spesiale<br>voorwaardes /<br>Special<br>conditions |
|-----------------------------|----------------|--|--|
|-----------------------------|----------------|--|--|

| Botaniese naam /<br>Botanical name   | Gewone naam /<br>Common name  |                        |                       |                                    |
|--|---|------------------------|-----------------------|------------------------------------|
| Kolom 1 / 0  | Kolom 1 / Column 1  |                        | Kolom 3 /<br>Column 3 | Kolom 4 /<br>Column 4              |
| Orobanche minor Sutton   | Klawerbesemraap,<br>Bremraap / Lesser<br>broomrape, Clover<br>broomrape | Onkruid /<br>Weed      | 1                     |                                    |
| Paraserianthes lophantha<br>(Willd.) Nielsen (=Albizia<br>lophantha (Willd.) Benth.) | Australiese Albizia,<br>stinkboon / Australian<br>Albizia, Stink bean   | Onkruid /<br>Weed      | 1                     |                                    |
| Parthenium hysterophorus<br>L.   | Parthenium  | Onkruid /<br>Weed      | 1                     |                                    |
| Passiflora coerulea L.   | Siergrenadella / Blue passion flower                                    | Onkruid /<br>Weed      | 1                     |                                    |
| Passiflora edulis Sims   | Grenadella / Purple granadilla, Passion fruit                           | Indringer<br>/ Invader | 2                     |                                    |
| Pennisetum setaceum (Forssk.) Chiov.   | Pronkgras /Fountain grass   | Onkruid /<br>Weed      | 1                     |                                    |
| <i>Pennisetum villosum</i> R.<br>Br. ex Fresen.                                      | Veergras / Feathertop   | Onkruid /<br>Weed      | 1                     |                                    |
| Pereskia aculeata Mill.  | Pereskia /Barbados<br>gooseberry  | Onkruid /<br>Weed      | 1                     |                                    |
| Pinus elliotti Engelm.   | Basden / Slash pine   | Indringer<br>/ Invader | 2                     | Kyk / See<br>subreg.<br>15.C(7)(c) |
| Pinus halepensis Mill.   | Aleppoden / Aleppo<br>pine  | Indringer<br>/ Invader | 3                     | Kyk / See<br>subreg.<br>15.C(7)(c) |
| Pinus patula Schlechtd. & Cham.  | Treurden / Patula pine  | Indringer<br>/ Invader | 2                     | Kyk / See<br>subreg.<br>15.C(7)(c) |
| Pinus pinaster Ait.  | Trosden / Cluster pine  | Indringer<br>/ Invader | 2                     | Kyk / See<br>subreg.<br>15.C(7)(c) |
| Pinus radiata D.Don  | Radiataden / Radiata<br>pine  | Indringer<br>/ Invader | 2                     | Kyk / See<br>subreg.<br>15.C(7)(c) |
| Pinus taeda L.   | Loblollyden / Loblolly pine   | Indringer<br>/ Invader | 2                     | Kyk / See<br>subreg.<br>15.C(7)(c) |
| Pistia stratiotes L.   | Waterslaai / Water<br>lettuce   | Onkruid /<br>Weed      | 1                     |                                    |
| Pittosporum undulatum  | Australiese kasuur, Soet  | Onkruid /              | 1                     |                                    |

| •   |   | Tipe /<br>Type           | Kategorie<br>/ Category | Spesiale<br>voorwaardes /<br>Special<br>conditions               |
|---|---|--------------------------|-------------------------|--|
| Botaniese naam /<br>Botanical name  | Gewone naam /<br>Common name                            |                          |                         |  |
| Kolom 1 / 0   | Column 1  | Kolom 2<br>/ Column<br>2 | Kolom 3 /<br>Column 3   | Kolom 4 /<br>Column 4  |
| Vent.   | Pittosporum / Australian cheesewood, Sweet pittospormum | Weed                     |                         |  |
| Pontederia cordata L.   | Pickerel weed   | Indringer<br>/ Invader   | 3                       | Kategorie 1 in landelike gebiede / Category 1 in non-urban areas |
| Populus alba L.   | Witpopulier / White<br>poplar                           | Indringer<br>/ Invader   | 3                       | Kyk / See<br>subreg.<br>15.C(7)(c)                               |
| Populus deltoides Bart.<br>ex. Marsh  | Vuurhoutjiepolpulier /<br>Match poplar                  | Indringer<br>/ Invader   | 2                       |  |
| Populus x canescens<br>(Ait.) J. E. Sm.   | Vaalpopulier / Grey<br>poplar                           | Indringer<br>/ Invader   | 3                       | Kyk / See<br>subreg.<br>15.C(7)(c)                               |
| Prosopis glandulosa Torr.<br>var torreyana (Benson)<br>Johnston and hybrids / en<br>hibriedes | Heuningprosopis /<br>Honey mesquite                     | Indringer<br>/ Invader   | 2                       |  |
| <i>Prosopis velutina</i> Wooton and hybrids / en hibriedes                                    | Fluweelprosopis / Velvet mesquite                       | Indringer<br>/ Invader   | 2                       |  |
| <i>Psidium guajava</i> L. and hybrids / en hibriedes  | Koejawel / Guava  | Indringer<br>/ Invader   | 2                       |  |
| Psidium guineense Swartz  | Brasiliaanse koejawel /<br>Brazilian guava              | Indringer<br>/ Invader   | 3                       |  |
| Psidium littorale Raddi var longipes (O. Berg)Fosb. (=P. cattleianum Sab.)                    | Aarbeikoejawel /<br>Strawberry guava                    | Indringer<br>/ Invader   | 3                       |  |
| <i>Pueraria lobata</i> (Willd.)<br>Ohwi   | Kudzuranker / Kudzu<br>vine                             | Onkruid /<br>Weed        | 1                       |  |
| Pyracantha angustifolia (Franch.) C.K. Schneid.   | Geelbranddoring /<br>Yellow firethorn                   | Indringer<br>/ Invader   | 3                       |  |
| Pyracantha crenulata (D. Don) M.J. Roem.  | Rooivuurdoring /<br>Himalayan firethorn                 | Indringer<br>/ Invader   | 3                       |  |
| Ricinus communis L  | Kasterolieboom /  | Indringer                | 2                       |  |

| •  |  | Tipe /<br>Type           | Kategorie<br>/ Category | Spesiale<br>voorwaardes /<br>Special<br>conditions |
|--|--|--------------------------|-------------------------|--|
| Botaniese naam /<br>Botanical name   | Gewone naam /<br>Common name                                   |                          |                         |  |
| Kolom 1 / 0  | Column 1   | Kolom 2<br>/ Column<br>2 | Kolom 3 /<br>Column 3   | Kolom 4 /<br>Column 4                              |
|  | Castor-oil plant   | / Invader                |                         |  |
| Robinia pseudoacacia L.  | Witakasia / Black locust                                       | Indringer<br>/ Invader   | 3                       | Kyk / See<br>subreg.<br>15.C(7)(c)                 |
| Rorippa nasturtium –<br>aquaticum (L.) Hayek<br>(=Nasturtium officinale R.<br>Br.) | Bronkors / Watercress  | Indringer<br>/ Invader   | 3                       |  |
| Rosa rubiginosa L.<br>(=R. eglanteria L.)  | Wilderoos / Eglantine,<br>Sweetbriar                           | Indringer<br>/ Invader   | 3                       |  |
| Rubus cuneifolius Pursh.<br>and hybrid R x proteus<br>C.H. Stirton                 | Amerikaanse braam, /<br>American bramble                       | Onkruid /<br>Weed        | 1                       |  |
| Rubus fruticosus L agg.  | Braam / European<br>blackberry                                 | Indringer<br>/ Invader   | 2                       |  |
| Salix babylonica L.  | Treurwilger /Weeping willow                                    | Indringer<br>/ Invader   | 3                       |  |
| Salix fragilis L.  | Crack or brittle willow  | Onkruid /<br>Weed        | 1                       |  |
| Salvinia molesta D. S.<br>Mitchell and other species<br>of the Family Salviniaceae | Watervaring / Kariba<br>weed                                   | Onkruid /<br>Weed        | 1                       |  |
| Schinus terebinthifolius<br>Raddi  | Brasiliaanse peperboom<br>/ Brazilian pepper tree              | Indringer<br>/ Invader   | 3                       | Kyk / See<br>subreg.<br>15.C(7)(c)                 |
| Sesbania punicea (Cav.)<br>Benth.  | Rooi sesbania / Red<br>sesbania                                | Onkruid /<br>Weed        | 1                       |  |
| Solanum elaeagnifolium<br>Cav.   | Satansbos / Silver-leaf bitter apple                           | Onkruid /<br>Weed        | 1                       |  |
| Solanum mauritianum<br>Scop.   | Luisboom / Bugweed   | Onkruid /<br>Weed        | 1                       |  |
| Solanum seaforthianum<br>Andr.   | Aartappelranker / Potato creeper                               | Onkruid /<br>Weed        | 1                       |  |
| Solanum sisymbrifolium<br>Lam.   | Wildetamatie,<br>Doringtamatie / Wild<br>tomato, Dense-thorned | Onkruid /<br>Weed        | 1                       |  |

| •  |   | Tipe /<br>Type           | Kategorie<br>/ Category | Spesiale<br>voorwaardes /<br>Special<br>conditions |
|--|---|--------------------------|-------------------------|--|
| Botaniese naam /<br>Botanical name                                       | Gewone naam /<br>Common name                |                          |                         |  |
| Kolom 1 / 0  | Column 1                                    | Kolom 2<br>/ Column<br>2 | Kolom 3 /<br>Column 3   | Kolom 4 /<br>Column 4                              |
|  | bitter apple                                |                          |                         |  |
| Spartium junceum L.  | Spaanse besem /<br>Spanish broom            | Onkruid /<br>Weed        | 1                       |  |
| Tamarix ramosissima<br>Ledeb.  | Perstamarisk / Pink tamarisk                | Indringer<br>/ Invader   | 3                       |  |
| Tamarix chinenis Lour.   | Chinese tamarisk /<br>Chinese tamarisk      | Indringer<br>/ Invader   | 3                       |  |
| Tecoma stans (L.) H.B.K.   | Geelklokkies / Yellow bells                 | Onkruid /<br>Weed        | 1                       |  |
| <i>Tipuana tipa</i> (Benth.)<br>Kuntze                                   | Tipoeboom / Tipu tree                       | Indringer<br>/ Invader   | 3                       | Kyk / See<br>subreg.<br>15.C(7)(c)                 |
| Tithonia diversifolia<br>(Hemsl.) A. Gray                                | Mexikaanse sonneblom<br>/ Mexican sunflower | Onkruid /<br>Weed        | 1                       |  |
| Tithonia rotundifolia (Mill.)<br>S.F. Blake                              | Rooisonneblom / Red sunflower               | Onkruid /<br>Weed        | 1                       |  |
| Toona ciliata M.J. Roem.<br>(=Cedrela toona Roxb. ex<br>Rottl. & Willd.) | Toonboom / Toon tree                        | Indringer<br>/ Invader   | 3                       | Kyk / See<br>subreg.<br>15.C(7)(c)                 |
| Ulex europaeus L.  | Gaspeldoring /<br>European gorse            | Onkruid /<br>Weed        | 1                       |  |
| Xanthium spinosum L.   | Boetebos / Spiny cocklebur                  | Onkruid /<br>Weed        | 1                       |  |
| Xanthium strumarium L.   | Kankerroos / Large<br>cocklebur             | Onkruid /<br>Weed        | 1                       |  |

## > Table 6: Declared Indicators of Bush Encroachment

| Soort pla   | Soort plant / Kind of plant   |  |
|---|---|--|
| Botaniese naam /<br>Botanical name  | Gewone naam / Common name   | toepassing / Application<br>area   |
| Kolom   | 1 / Column 1  | Kolom 2 / Column 2   |
| Acacia caffra (Thunb.)<br>Willd.  | Haakdoring, Wag-'n-bietjie<br>/Common hookthorn                       | Mpumalanga, Gauteng,<br>Noordelike Provinsie /<br>Northern Province, Noord-<br>Wes / North-West  |
| Acacia erubescens Welw.<br>ex Oliv.   | Blouhaak / Blue thorn   | Mpumalanga, Gauteng, Oos,<br>Noord en Wes Kaap /<br>Eastern, Northern and<br>Western Cape, Noord-Wes /<br>North-West, Noordelike<br>Provinsie / Northern Province                            |
| Acacia fleckii Schinz   | Bladdoring, Geelhaak / Plate thorn                                    | Oos-, Noord- en Wes-Kaap /<br>Eastern, Northern and<br>Western Cape  |
| Acacia hebeclada DC.<br>subsp. hebeclada                                    | Trassiedoring, Trassiebos,<br>Muisdoring / Mousebush, Candle<br>thorn | Mpumalanga, Gauteng, Oos-,<br>Noord- en Wes-Kaap /<br>Eastern, Northern and<br>Western Cape, Noordwes /<br>North-West, Noordelike<br>Provinsie / Northern Province,<br>Vrystaat / Free State |
| Acacia karroo Hayne   | Soetdoring, Pendoring / Sweet thorn, Karoo thorn                      | Republiek / Republic   |
| Acacia mellifera (Vahl)<br>Benth. subsp. Detinens<br>(Burch.) Brenan        | Swarthaak / Black thorn   | Mpumalanga, Gauteng, Oos-,<br>Noord- en Wes-Kaap /<br>Eastern, Northern and<br>Western Cape, Noordwes /<br>North-West, Noordelike<br>Provinsie / Northern Province                           |
| Acacia nigrescens Oliver  | Knoppiesdoring / Knob-thorn   | Mpumalanga, Noordelike<br>Provinsie / Northern Province<br>Noordwes / North-West   |
| Acacia nilotica (L.) Willd.<br>ex Del. subsp. Kraussiana<br>(Benth.) Brenan | Lekkerruikpeul, Snuifpeul,<br>Stinkpeul / Scented thorn,<br>Redheart  | Kwazulu-Natal, Mpumalanga,<br>Gauteng, Noordwes / North-<br>West, Noordelike Provinsie /<br>Northern Province  |
| Acacia reficiens Wawra subsp. Reficiens                                     | Vals haak-en-steek, Geelhaak /<br>False umbrella thorn                | Mpumalanga, Gauteng, Oos-,<br>Noord- en Wes-Kaap /<br>Eastern, Northern and<br>Western Cape, Noordwes /  |

| Soort plant / Kind of plant   |  | Gebied waar van   |
|---|--|---|
| Botaniese naam /<br>Botanical name  | Gewone naam / Common name  | toepassing / Application<br>area  |
| Kolom   | 1 / Column 1   | Kolom 2 / Column 2  |
|   |  | North-West, Noordelike<br>Provinsie / Northern Province   |
| Acacia robusta Burch.<br>subsp. R <i>obusta</i>                               | Enkeldoring, Brosdoring /<br>Splendid thorn                                    | Mpumalanga, Gauteng,<br>Noordelike Provinsie /<br>Northern Province, Noordwes<br>/ North-West   |
| Acacia senegal (L.) Willd.<br>Var.rostrata Brenan                             | Driehaakdoring, Drievingerdoring<br>/ Threehook thorn, Three-thorned<br>Acacia | Kwazulu-Natal, Oos-, Noord-<br>en Wes-Kaap / Eastern,<br>Northern and Western Cape  |
| Acacia tenuispina<br>Verdoorn   | Fyndoring  | Mpumalanga, Gauteng,<br>Noordelike Provinsie /<br>Northern Province, Noordwes<br>/ North-West   |
| Acacia tortilis (Forsk.)<br>Hayne subsp.<br>Heteracantha (Burch.)<br>Brenan   | Haak-en-steek / Umbrella thorn,<br>Curly pod Acacia                            | Kwazulu-Natal, Mpumalanga,<br>Gauteng, Oos, Noord en Wes<br>Kaap / Eastern, Northern and<br>Western Cape, Noordelike<br>Provinsie / Northern Province<br>Noord-Wes / North-West |
| Colophospermum mopane<br>(Kirk ex Benth.) Kirk ex J.<br>Léonard               | Mopanie / Mopane   | Mpumalanga, Noordelike<br>Provinsie / Northern Province<br>Noordwes / North-West  |
| Combretum apiculatum<br>Sond. Subsp. <i>Apiculatum</i>                        | Rooibos / Red bush willow  | Mpumalanga, Gauteng,<br>Noordelike Provinsie /<br>Northern Province, Noordwes<br>/ North-West   |
| Commiphora pyracanthoides Engl.   | Gewone kanniedood, Kurkbas /<br>Cork tree, Common corkwood                     | KwaZulu-Natal, Mpumalanga,<br>Gauteng, Noord-Wes /<br>Noordwest, Noordelike<br>Provinsie / Northern Province  |
| Dichapetalum cynosum<br>(Hook.) Engl.   | Gifblaar / Poison leaf   | Mpumalanga, Gauteng,<br>Noordelike Provinsie /<br>Northern Province, Noordwes<br>/ North-West   |
| Dichrostachys cinerea (L.)<br>Wight & Arn. subsp.<br>africana Brenan & Brumm. | Sekelbos / Sickle bush   | Mpumalanga, Gauteng,<br>Noordelike Provinsie /<br>Northern Province Noord-<br>Wes / Noordwes, Wes- en<br>Noord-Kaap / Western and<br>Northern                                   |
| Grewia bicolor Juss.  | Basterrosyntjie (bos) / Bastard raisin bush                                    | Oos-, Noord- en Wes-Kaap /<br>Eastern, Northern and<br>Western Cape   |
| Grewia flava DC.  | Fluweelrosyntjie, Wilderosyntjie   | KwaZulu-Natal, Mpumalanga,  |

| Soort plant / Kind of plant                       |   | Gebied waar van   |
|---|---|---|
| Botaniese naam /<br>Botanical name                | Gewone naam / Common name   | toepassing / Application<br>area  |
| Kolom   | 1 / Column 1  | Kolom 2 / Column 2  |
|   | (bos) / Wild raisin, Velvet raisin  | Gauteng, Noordwes / North-<br>West, Noordelike Provinsie /<br>Northern Province   |
| Grewia flavescens Juss.                           | Skurwerosyntjie (bos) / Rough<br>leaved raisin, Sandpaper raisin                                | Oos-, Noord- en Wes-Kaap /<br>Eastern, Northern and<br>Western Cape   |
| Leucosidea sericea Eckl. & Zeyh.                  | Ouhout / Oldwood  | Republiek / Republic  |
| Lopholaena coriifolia<br>(Sond.) Phill. & C.A. Sm | Pluisbossie / Lopholaena  | Mpumalanga, Gauteng,<br>Noordelike Provinsie /<br>Northern Province, Noordwes<br>/ North-West   |
| Maytenus senegalensis<br>(Lam.) Exell             | Rooipendoring / Red spikethorn  | KwaZulu-Natal   |
| Rhamnus prinoides<br>L'Herit.                     | Blinkblaar / Gloss leaf   | Republiek / Republic  |
| Rhigozum trichotomum<br>Burch.                    | Wildegranaat, Driedoring / Wild granate   | Oos-, Noord- en Wes-Kaap /<br>Eastern, Northern and<br>Western Cape   |
| Rhus ciliata Licht. ex<br>Schult.                 | Suurkaree / Sour karree   | Republiek / Republic  |
| Rhus glauca Thunb.                                | Blinkblaar, Suurbessie  | Republiek / Republic  |
| Rhus lancea L.f.                                  | Karee / Karree  | Mpumalanga, Gauteng,<br>Noordelike Provinsie /<br>Northern Province, Noordwes<br>/ North-West   |
| Rhus lucida L. forma<br>lucida                    | Blinktaaibos, Besembos / Glossy taaibos   | Republiek / Republic  |
| Rhus rehmanniana Engl.                            | Suur taaibos / Sour taaibos   | Republiek / Republic  |
| Tarchonanthus camphoratus L.                      | Kanferbos, Vaalbos / Camphor<br>bush, Sagewood  | Oos-, Noord- en Wes-Kaap /<br>Eastern, Northern and<br>Western Cape   |
| Terminalia sericea Burch.<br>ex DC.               | Sandvaalboom, Sandgeelhout /<br>Silver cluster leaf, Transvaal<br>silvertree, Silver Terminalia | KwaZulu-Natal, Mpumalanga,<br>Gauteng, Oos-, Noord- en<br>Wes-Kaap / Eastern,<br>Northern and Western Cape,<br>Noordelike Provinsie /<br>Northern Province Noordwes<br>/ North-West |

# **Appendix 4: Protected Trees**

| Botanical Name                         | Common English Name |
|--|---------------------|
| Acacia erioloba                        | Camel Thorn         |
| Acacia haematoxylon                    | Grey Camel Thorn    |
| Adansonia digitata                     | Baobab              |
| Afzelia quanzensis                     | Pod Mahogany        |
| Balanites [maughamii]                  | Torchwood           |
| Barringtonia racemosa                  | Powder-puff Tree    |
| Boscia albitrunca                      | Shepherd's Tree     |
| Brachystegia spiciformis               | Msasa               |
| Breonadia salicina                     | Matumi              |
| Bruguiera gymnorrhiza                  | Black Mangrove      |
| Cassipourea swaziensis                 | Swazi Onionwood     |
| Catha edulis                           | Bushman's Tea       |
| Ceriops tagal                          | Indian Mangrove     |
| Cleistanthus schlechteri [schlechteri] | False Tamboti       |
| Colubrina nicholsonii                  | Pondo Weeping Thorn |
| Combretum imberbe                      | Leadwood            |
| Curtisia dentata                       | Assegai             |
| Elaeodendron transvaalensis            | Bushveld Saffron    |

| Botanical Name                          | Common English Name      |
|---|--------------------------|
| Erythrophysa transvaalensis             | Bushveld Red Balloon     |
| Euclea pseudebenus                      | Ebony Guarri             |
| Ficus trichopoda                        | Swamp Fig                |
| Leucadendron argenteum                  | Silver Tree              |
| Lumnitzera racemosa [racemosa]          | Tonga Mangrove           |
| Lydenburgia abbottii                    | Pondo Bushman's Tea      |
| Lydenburgia cassinoides                 | Sekhukhuni Bushman's Tea |
| Mimusops caffra                         | Coastal Red Milkwood     |
| Newtonia hildebrandtii [ hildebrandtii] | Lebombo Wattle           |
| Ocotea bullata                          | Stinkwood                |
| Ozoroa namaquensis                      | Gariep Resin Tree        |
| Philenoptera violacea                   | Apple-leaf               |
| Pittosporum viridiflorum                | Cheesewood               |
| Podocarpus elongatus                    | Breede River Yellowwood  |
| Podocarpus falcatus                     | Outeniqua Yellowwood     |
| Podocarpus henkelii                     | Henkel's Yellowwood      |
| Podocarpus latifolius                   | Real Yellowwood          |
| Protea comptonii                        | Saddleback               |
| Protea curvata                          | Serpentine Sugarbush     |
| Prunus africana                         | Red Stinkwood            |
| Pterocarpus angolensis                  | Wild Teak                |

| Botanical Name               | Common English Name |
|------------------------------|---------------------|
| Rhizophora mucronata         | Red Mangrove        |
| Sclerocarya birrea [caffra]  | Marula              |
| Securidaca longepedunculata  | Violet Tree         |
| Sideroxylon inerme [ inerme] | White Milkwood      |
| Tephrosia pondoensis         | Pondo Poison Pea    |
| Warburgia salutaris          | Pepper-bark Tree    |
| Widdringtonia cedarbergensis | Clanwilliam Cedar   |
| Widdringtonia schwarzii      | Willowmore Cedar    |

| CEN | Integrated | <b>Environmental</b> | Management | Unit  |
|-----|------------|----------------------|------------|-------|
| CEN | miegraleu  | Environmental        | wanagement | Ullit |

Appendix 5: List of TOPS (in terms of Biodiversity Act 10of 2004)

### SCHEDULE

| Scientific Name                    | Common Name              |
|------------------------------------|--------------------------|
| PISCES                             |                          |
| Labeo seeberi                      | Clanwilliam Sandfish     |
|                                    | ·                        |
| REPTILIA                           | It t C Tt-               |
| Caretta caretta                    | Loggerhead Sea Turtle    |
| Dermochelys coriacea               | Leatherback Sea Turtle   |
| Eretmoch elys imbricate            | Hawksbill Sea Turtle     |
| AVES                               |                          |
| Grus carunculatus                  | Wattled Crane            |
| Hirundo atrocaerulea               | Blue Swallow             |
| Neophronpercnopterus               | Egyptian Vulture         |
| Poicephalus robustus               | Cape Parrot              |
|                                    | 1                        |
| MAMMALIA<br>Bunolagus monticularis | Riverine Rabbit          |
| Chrysospalaxvillosus               | Rough-haired Golden Mole |
| Chrysospaiaxviiiosus               | Rough-haired Golden Mole |
| FLORA                              |                          |
| Adenium swazicum                   | Swaziland Impala Lily    |
| Aloe pillansii                     | False Quiver Tree        |
| Diaphananthe millarii              | Tree Orchid              |
| Dioscorea ebutsiniorum             | Wild Yam                 |
| Encephalartos aemulans             | Ngotshe Cycad            |
| Encephalartos brevifoliolatus      | Escarpment Cycad         |
| Encephalartos cerinus              | Waxen Cycad              |
| Encephalartos dolomiticus          | Wolkberg Cycad           |
| Encephalartos heenanii             | Woolly Cycad             |
| Encephalartos hirsutus             | Venda Cycad              |
| Encephalartos inopinus             | Lydenburg Cycad          |
| Encephalartos latifrons            | Albany Cycad             |
| Encephalartos middelburgensis      | Middelburg Cycad         |

| Encephalartosnubimontanus | Blue Cycad   |
|---------------------------|--------------|
| Encephalartos woodii      | Wood's Cycad |

| Scientific Name   Common Name    INVERTEBRATA   Colophonspp - All species   Stag Beetles    PISCES   Barbus andrewi   Whitefish   Barbus serra   Sawfiin   Pristis microdon   Largetooth Sawfish    REPTILIA   Chelonia mydas   Green Turtle   Cordylus giganteus   Giant Girdled Lizard   Lepidochelys olivacea   Olive Ridley Turtle   Psammobates geometricus   Geometric Tortoise    Anthropoides paradiseus   Blue Crane   Balearica regulorum   Grey Crowned Crane   Ephippiorhynchus senegalensis   Saddle-billed Stork   Gypaetus barbatus   Bearded Vulture   Gyps africanus   White-backed Vulture   Gyps coprotheres   Cape Vulture   Necrosyrtes monachus   Hooded Vulture   Pelecanus rufescens   Pink-backed Pelican   Scotopelia peli   Pel's Fishing Owl   Torgos tracheliotus   Robust Golden Mole   Damaliscus lunatus   Tsessebe   Diceros bicornis   Black Rhinoceros  | CATEGORY: Endangered Species - Indigenous species facing a high risk of                  |                      |  |
|--|--|----------------------|--|
| Scientific Name   Common Name  | extinction in the wild in the near future, although they are not a critically endangered |                      |  |
| INVERTEBRATA  Colophonspp - All species   Stag Beetles  PISCES  Barbus andrewi   Whitefish  Barbus serra   Sawfin  Pristis microdon   Largetooth Sawfish  REPTILIA  Chelonia mydas   Green Turtle  Cordylus giganteus   Giant Girdled Lizard  Lepidochelysolivacea   Olive Ridley Turtle  Psammobates geometricus   Geometric Tortoise  Anthropoides paradiseus   Blue Crane  Balearica regulorum   Grey Crowned Crane  Ephippiorhynchus senegalensis   Saddle-billed Stork  Gypaetus barbatus   Bearded Vulture  Gyps africanus   White-backed Vulture  Gyps coprotheres   Cape Vulture  Necrosyrtes monachus   Hooded Vulture  Pelecanus rufescens   Pink-backed Pelican  Scotopelia peli   Pel's Fishing Owl  Torgos tracheliotus   Robust Golden Mole  Damaliscus lunatus   Tsessebe  Diceros bicornis   Black Rhinoceros  |  | Common Nome          |  |
| PISCES  Barbus andrewi Whitefish  Barbus serra Sawfin  Pristis microdon Largetooth Sawfish  REPTILIA  Chelonia mydas Green Turtle  Cordylus giganteus Giant Girdled Lizard  Lepidochelys olivacea Olive Ridley Turtle  Psammobates geometricus Geometric Tortoise  Anthropoides paradiseus Blue Crane  Balearica regulorum Grey Crowned Crane  Ephippiorhynchus senegalensis Saddle-billed Stork  Gypa africanus White-backed Vulture  Gyps africanus White-backed Vulture  Recrosyrtes monachus Hooded Vulture  Pelecanus rufescens Pink-backed Pelican  Scotopelia peli Pel's Fishing Owl  Torgos tracheliotus Robustus  Robust Golden Mole  Damaliscus lunatus  Diceros bicornis Black Rhinoceros   | Scientific Name  | Common Name          |  |
| PISCES  Barbus andrewi Whitefish  Barbus serra Sawfin  Pristis microdon Largetooth Sawfish  REPTILIA  Chelonia mydas Green Turtle  Cordylus giganteus Giant Girdled Lizard  Lepidochelys olivacea Olive Ridley Turtle  Psammobates geometricus Geometric Tortoise  Anthropoides paradiseus Blue Crane  Balearica regulorum Grey Crowned Crane  Ephippiorhynchus senegalensis Saddle-billed Stork  Gypa africanus White-backed Vulture  Gyps africanus White-backed Vulture  Recrosyrtes monachus Hooded Vulture  Pelecanus rufescens Pink-backed Pelican  Scotopelia peli Pel's Fishing Owl  Torgos tracheliotus Robustus  Robust Golden Mole  Damaliscus lunatus  Diceros bicornis Black Rhinoceros   | INVERTEBRATA   |                      |  |
| Barbus andrewi       Whitefish         Barbus serra       Sawfin         Pristis microdon       Largetooth Sawfish         REPTILIA       Chelonia mydas       Green Turtle         Cordylus giganteus       Giant Girdled Lizard         Lepidochelys olivacea       Olive Ridley Turtle         Psammobates geometricus       Geometric Tortoise         Anthropoides paradiseus       Blue Crane         Balearica regulorum       Grey Crowned Crane         Ephippiorhynchus senegalensis       Saddle-billed Stork         Gypaetus barbatus       Bearded Vulture         Gyps africanus       White-backed Vulture         Gyps coprotheres       Cape Vulture         Necrosyrtes monachus       Hooded Vulture         Pelecanus rufescens       Pink-backed Pelican         Scotopelia peli       Pel's Fishing Owl         Torgos tracheliotus       Lappet-faced Vulture         Amblysomus robustus       Robust Golden Mole         Danaliscus lunatus       Tsessebe         Diceros bicornis       Black Rhinoceros |  | Stag Beetles         |  |
| Barbus andrewi       Whitefish         Barbus serra       Sawfin         Pristis microdon       Largetooth Sawfish         REPTILIA       Chelonia mydas       Green Turtle         Cordylus giganteus       Giant Girdled Lizard         Lepidochelys olivacea       Olive Ridley Turtle         Psammobates geometricus       Geometric Tortoise         Anthropoides paradiseus       Blue Crane         Balearica regulorum       Grey Crowned Crane         Ephippiorhynchus senegalensis       Saddle-billed Stork         Gypaetus barbatus       Bearded Vulture         Gyps africanus       White-backed Vulture         Gyps coprotheres       Cape Vulture         Necrosyrtes monachus       Hooded Vulture         Pelecanus rufescens       Pink-backed Pelican         Scotopelia peli       Pel's Fishing Owl         Torgos tracheliotus       Lappet-faced Vulture         Amblysomus robustus       Robust Golden Mole         Danaliscus lunatus       Tsessebe         Diceros bicornis       Black Rhinoceros | PISCES   | - 1                  |  |
| Pristis microdon  REPTILIA Chelonia mydas Green Turtle Cordylus giganteus Giant Girdled Lizard Lepidochelys olivacea Olive Ridley Turtle Psammobates geometricus Geometric Tortoise  Anthropoides paradiseus Blue Crane Balearica regulorum Grey Crowned Crane Ephippiorhynchus senegalensis Saddle-billed Stork Gypaetus barbatus Bearded Vulture Gyps africanus White-backed Vulture Gyps coprotheres Cape Vulture Necrosyrtes monachus Hooded Vulture Pelecanus rufescens Pink-backed Pelican Scotopelia peli Pel's Fishing Owl Torgos tracheliotus Robust Golden Mole Damaliscus lunatus Diceros bicornis Black Rhinoceros   |  | Whitefish            |  |
| REPTILIA  Chelonia mydas  Green Turtle  Cordylus giganteus  Lepidochelys olivacea  Olive Ridley Turtle  Psammobates geometricus  Geometric Tortoise  Anthropoides paradiseus  Blue Crane  Balearica regulorum  Grey Crowned Crane  Ephippiorhynchus senegalensis  Saddle-billed Stork  Gypaetus barbatus  Bearded Vulture  Gyps africanus  White-backed Vulture  Gyps coprotheres  Cape Vulture  Necrosyrtes monachus  Hooded Vulture  Pelecanus rufescens  Pink-backed Pelican  Scotopelia peli  Torgos tracheliotus  Robust Golden Mole  Damaliscus lunatus  Diceros bicornis  Black Rhinoceros  | Barbus serra   | Sawfin               |  |
| Chelonia mydas       Green Turtle         Cordylus giganteus       Giant Girdled Lizard         Lepidochelys olivacea       Olive Ridley Turtle         Psammobates geometricus       Geometric Tortoise         Anthropoides paradiseus       Blue Crane         Balearica regulorum       Grey Crowned Crane         Ephippiorhynchus senegalensis       Saddle-billed Stork         Gypaetus barbatus       Bearded Vulture         Gyps africanus       White-backed Vulture         Gyps coprotheres       Cape Vulture         Necrosyrtes monachus       Hooded Vulture         Pelecanus rufescens       Pink-backed Pelican         Scotopelia peli       Pel's Fishing Owl         Torgos tracheliotus       Lappet-faced Vulture         Amblysomus robustus       Robust Golden Mole         Damaliscus lunatus       Tsessebe         Diceros bicornis       Black Rhinoceros   | Pristis microdon   | Largetooth Sawfish   |  |
| Chelonia mydas       Green Turtle         Cordylus giganteus       Giant Girdled Lizard         Lepidochelys olivacea       Olive Ridley Turtle         Psammobates geometricus       Geometric Tortoise         Anthropoides paradiseus       Blue Crane         Balearica regulorum       Grey Crowned Crane         Ephippiorhynchus senegalensis       Saddle-billed Stork         Gypaetus barbatus       Bearded Vulture         Gyps africanus       White-backed Vulture         Gyps coprotheres       Cape Vulture         Necrosyrtes monachus       Hooded Vulture         Pelecanus rufescens       Pink-backed Pelican         Scotopelia peli       Pel's Fishing Owl         Torgos tracheliotus       Lappet-faced Vulture         Amblysomus robustus       Robust Golden Mole         Damaliscus lunatus       Tsessebe         Diceros bicornis       Black Rhinoceros   |  |                      |  |
| Cordylus giganteus  Lepidochelys olivacea Olive Ridley Turtle Psammobates geometricus Geometric Tortoise  Blue Crane Balearica regulorum Grey Crowned Crane Ephippiorhynchus senegalensis Saddle-billed Stork Gypaetus barbatus Bearded Vulture Gyps africanus White-backed Vulture Gyps coprotheres Cape Vulture Necrosyrtes monachus Hooded Vulture Pelecanus rufescens Pink-backed Pelican Scotopelia peli Pel's Fishing Owl Torgos tracheliotus Robust Golden Mole Damaliscus lunatus Diceros bicornis Black Rhinoceros  |  |                      |  |
| Lepidochelys olivacea Psammobates geometricus Geometric Tortoise  Blue Crane Balearica regulorum Grey Crowned Crane Ephippiorhynchus senegalensis Saddle-billed Stork Gypaetus barbatus Bearded Vulture Gyps africanus White-backed Vulture Gyps coprotheres Cape Vulture Necrosyrtes monachus Hooded Vulture Pelecanus rufescens Pink-backed Pelican Scotopelia peli Pel's Fishing Owl Torgos tracheliotus Robust Golden Mole Damaliscus lunatus Diceros bicornis Black Rhinoceros  | •  |                      |  |
| Psammobates geometricus  Geometric Tortoise  Blue Crane Balearica regulorum Grey Crowned Crane Ephippiorhynchus senegalensis Saddle-billed Stork Gypaetus barbatus Bearded Vulture Gyps africanus White-backed Vulture Gyps coprotheres Cape Vulture Necrosyrtes monachus Hooded Vulture Pelecanus rufescens Pink-backed Pelican Scotopelia peli Pel's Fishing Owl Torgos tracheliotus Robust Golden Mole Damaliscus lunatus Diceros bicornis Black Rhinoceros   | Cordylus giganteus   |                      |  |
| Anthropoides paradiseus Balearica regulorum Grey Crowned Crane Ephippiorhynchus senegalensis Saddle-billed Stork Gypaetus barbatus Bearded Vulture Gyps africanus White-backed Vulture Cape Vulture Necrosyrtes monachus Hooded Vulture Pelecanus rufescens Pink-backed Pelican Scotopelia peli Pel's Fishing Owl Torgos tracheliotus Robust Golden Mole Damaliscus lunatus Diceros bicornis Black Rhinoceros  | Lepidochelysolivacea   | Olive Ridley Turtle  |  |
| Balearica regulorum       Grey Crowned Crane         Ephippiorhynchus senegalensis       Saddle-billed Stork         Gypaetus barbatus       Bearded Vulture         Gyps africanus       White-backed Vulture         Gyps coprotheres       Cape Vulture         Necrosyrtes monachus       Hooded Vulture         Pelecanus rufescens       Pink-backed Pelican         Scotopelia peli       Pel's Fishing Owl         Torgos tracheliotus       Lappet-faced Vulture         Amblysomus robustus       Robust Golden Mole         Damaliscus lunatus       Tsessebe         Diceros bicornis       Black Rhinoceros   | Psammobates geometricus  | Geometric Tortoise   |  |
| Balearica regulorum       Grey Crowned Crane         Ephippiorhynchus senegalensis       Saddle-billed Stork         Gypaetus barbatus       Bearded Vulture         Gyps africanus       White-backed Vulture         Gyps coprotheres       Cape Vulture         Necrosyrtes monachus       Hooded Vulture         Pelecanus rufescens       Pink-backed Pelican         Scotopelia peli       Pel's Fishing Owl         Torgos tracheliotus       Lappet-faced Vulture         Amblysomus robustus       Robust Golden Mole         Damaliscus lunatus       Tsessebe         Diceros bicornis       Black Rhinoceros   |  |                      |  |
| Ephippiorhynchus senegalensis  Gypaetus barbatus  Bearded Vulture  Gyps africanus  White-backed Vulture  Cape Vulture  Necrosyrtes monachus  Hooded Vulture  Pelecanus rufescens  Pink-backed Pelican  Scotopelia peli  Pel's Fishing Owl  Torgos tracheliotus  Robust Golden Mole  Damaliscus lunatus  Diceros bicornis  Black Rhinoceros   | Anthropoidesparadiseus   | Blue Crane           |  |
| Gypaetus barbatus       Bearded Vulture         Gyps africanus       White-backed Vulture         Gyps coprotheres       Cape Vulture         Necrosyrtes monachus       Hooded Vulture         Pelecanus rufescens       Pink-backed Pelican         Scotopelia peli       Pel's Fishing Owl         Torgos tracheliotus       Lappet-faced Vulture         Amblysomus robustus       Robust Golden Mole         Damaliscus lunatus       Tsessebe         Diceros bicornis       Black Rhinoceros  | Balearica regulorum  | Grey Crowned Crane   |  |
| Gyps africanus       White-backed Vulture         Gyps coprotheres       Cape Vulture         Necrosyrtes monachus       Hooded Vulture         Pelecanus rufescens       Pink-backed Pelican         Scotopelia peli       Pel's Fishing Owl         Torgos tracheliotus       Lappet-faced Vulture         Amblysomus robustus       Robust Golden Mole         Damaliscus lunatus       Tsessebe         Diceros bicornis       Black Rhinoceros  | Ephippiorhynchus senegalensis  | Saddle-billed Stork  |  |
| Gyps coprotheres       Cape Vulture         Necrosyrtes monachus       Hooded Vulture         Pelecanus rufescens       Pink-backed Pelican         Scotopelia peli       Pel's Fishing Owl         Torgos tracheliotus       Lappet-faced Vulture         Amblysomus robustus       Robust Golden Mole         Damaliscus lunatus       Tsessebe         Diceros bicornis       Black Rhinoceros  | Gypaetus barbatus  | Bearded Vulture      |  |
| Necrosyrtes monachus       Hooded Vulture         Pelecanus rufescens       Pink-backed Pelican         Scotopelia peli       Pel's Fishing Owl         Torgos tracheliotus       Lappet-faced Vulture         Amblysomus robustus       Robust Golden Mole         Damaliscus lunatus       Tsessebe         Diceros bicornis       Black Rhinoceros  | Gyps africanus   | White-backed Vulture |  |
| Pelecanus rufescens       Pink-backed Pelican         Scotopelia peli       Pel's Fishing Owl         Torgos tracheliotus       Lappet-faced Vulture         Amblysomus robustus       Robust Golden Mole         Damaliscus lunatus       Tsessebe         Diceros bicornis       Black Rhinoceros  | Gyps coprotheres   | Cape Vulture         |  |
| Scotopelia peli Pel's Fishing Owl  Torgos tracheliotus Lappet-faced Vulture  Amblysomus robustus Robust Golden Mole  Damaliscus lunatus Tsessebe  Diceros bicornis Black Rhinoceros  | Necrosyrtes monachus   | Hooded Vulture       |  |
| Torgos tracheliotus  Lappet-faced Vulture  Amblysomus robustus Robust Golden Mole  Damaliscus lunatus Tsessebe  Black Rhinoceros   | Pelecanus rufescens  | Pink-backed Pelican  |  |
| Amblysomus robustus  Robust Golden Mole  Damaliscus lunatus  Tsessebe  Black Rhinoceros  | Scotopelia peli  | Pel's Fishing Owl    |  |
| Damaliscus lunatus     Tsessebe       Diceros bicornis     Black Rhinoceros  | Torgos tracheliotus  | Lappet-faced Vulture |  |
| Damaliscus lunatus     Tsessebe       Diceros bicornis     Black Rhinoceros  |  |                      |  |
| Diceros bicornis Black Rhinoceros  | Amblysomus robustus  | Robust Golden Mole   |  |
| 1  | Damaliscus lunatus   | Tsessebe             |  |
| Equipment Takes  | Diceros bicornis   | Black Rhinoceros     |  |
| Mountain Zebra Mountain Zebra  | Equuszebra   | Mountain Zebra       |  |

| Gunning's Golden Mole Oribi Red Squirrel |
|--|
|  |
| Red Squirrel                             |
|  |
| Four-toed Elephant-shrew                 |
|  |
| Tree Orchid                              |
| Dune Cycad                               |
| Blyde River Cycad                        |
| Eastern Cape Blue Cycad                  |
| Kaapsehoop Cycad                         |
| Lebombo Cycad                            |
| Msinga Cycad                             |
| Pondoland Coconut                        |
| Wild Ginger                              |
| Pepper-bark Tree                         |
| Lebombo Wattle                           |
|  |

| Scientific Name            | Common Name                       |
|----------------------------|-----------------------------------|
|                            |                                   |
| Peripatopsis alba          | White Cave Velvet Worm            |
| PISCES                     |                                   |
| Epinephelus andersoni      | Catface Rockcod                   |
| Labeobarbus capensis       | Clanwilliam Yellowfish            |
| Labeobarbus kimberleyensis | Vaai-Orange Largemouth Yellowfish |
| Myxus capensis             | Freshwater Mullet                 |
| Oreochromis placidus       | Black Tilapia                     |
| Serranochromis meridianus  | Lowveld Largemouth                |
| AVES                       |                                   |
| Trigonoceps occipitalis    | White-headed Vulture              |
| Aquila <b>rapa</b> x       | Tawny Eagle                       |
| Ardeotis kori              | Kori Bustard                      |

| Ciconia nigra                       | Black Stork                 |
|-------------------------------------|-----------------------------|
| Circaetus fasciolatus               | Southern Banded Snake Eagle |
| Eupodotis caerulescens              | Blue Korhaan                |
| Falco fasciinucha                   | Taita Falcon                |
| Falco naumanni                      | Lesser Kestrel              |
| Falco peregrinus                    | Peregrine Falcon            |
| Geronticus calvus                   | Bald Ibis                   |
| Neotis ludwigii                     | Ludwig's Bustard            |
| Polemaetus bellicosus               | Martial Eagle               |
| Terathopiusecaudatus                | Bateleur                    |
| Tyto capensis                       | Grass Owl                   |
| MAMMALIA                            |                             |
| Acinonyx jubatus                    | Cheetah                     |
|                                     | 2                           |
| Chrysospalaxtrevelyani              | Giant Golden Mole           |
| Cricetomys gambianus                | Giant Rat                   |
| Damaliscus <b>pygargus</b> pygargus | Bontebok                    |
| Dendrohyrax arboreus                | Tree Hyrax                  |
| Hippotragus equinus                 | Roan Antelope               |
| Manis temminckii                    | Pangolin                    |
| Neamblysomusjulianae                | Juliana's Golden Mole       |
| Neotragus <b>moschatus</b>          | Suni                        |
| Otomops martiensseni                | Large-eared Free-tailed Bat |
| Panthera <b>leo</b>                 | Lion                        |
| Panthera <b>pardus</b>              | Leopard                     |
| Philantomba monticola               | Blue Duiker                 |
|                                     |                             |
| Aloe albida                         | Grass Aloe                  |
| Encephalartoseugene-maraisii        | Waterberg Cycad             |
| Encephalartos ngoyanus              | Ngoye Dwarf Cycad           |
| Merwilla <b>plumbea</b>             | Blue Squill                 |
| Zantedeschia jucunda                | Yellow Arum Lily            |

| Scientific Name                   | Common Name                         |
|-----------------------------------|-------------------------------------|
|                                   |                                     |
| INVERTEBRATA Aloeides clarki      | Coega Copper Butterfly              |
| Ceratogyrus spp – All species     | Horned Baboon Spiders               |
| Echinodiscus bisperforatus        | Pansy Shell                         |
|                                   | •                                   |
| Dromica spp – All species         | Tiger Beetles  Velvet Ground Beetle |
| Graphipterus assimilis            |                                     |
| Hadogenes spp – All species       | Flat Rock Scorpions                 |
| Haliotis midae                    | South A frican Abalone              |
| Xarpactira spp – All species      | Common Baboon Spiders               |
| Ichnestoma spp – All species      | Fruit Chafer Beetles                |
| Manticora spp – All species       | Monster Tiger Beetles               |
| Megacephala asperata              | Tiger Beetle                        |
| Megacephala regalis               | Tiger Beetle                        |
| Nigidius auriculatus              | Stag Beetle                         |
| Oonotus adspersus                 | Stag Beetle                         |
| Oonotus interioris                | Stag Beetle                         |
| Oonotus rex                       | Stag Beetle                         |
| Oonotus sericeus                  | Stag Beetle                         |
| Opisthacanthus spp - All species  | Creeping Scorpions                  |
| Opistophthalmus spp - All species | Burrowing Scorpions                 |
| Platychile pallida                | Tiger Beetle                        |
| Prosopocoilus petitclerci         | Stag Beetle                         |
| Prothyma guttipennis              | Tiger Beetle                        |
| Pterinochilus spp -All species    | Golden Baboon Spiders               |
| AMPHIBIA                          |                                     |
| Pyxicephalus adspersus            | Giant Bullfrog                      |
| Pyxicephalus edulis               | African Bullfrog                    |
| PISCES                            |                                     |
| Anchichoerops natalensis          | Natal Wrasse                        |
| Brycinus lateralis                | Striped Robber                      |
| Carcharodon carcharius            | Great White Shark                   |
| Epinephelus lanceolatus           | Brindle Bass                        |

| Epinephelus tukula                 | Potato Bass              |
|------------------------------------|--------------------------|
| Hydrocynus vittatus                | Tigerfish                |
| Latimeria chalumnae                | Coelacanth               |
| Lithognathus lithognathus          | White Steenbras          |
| Nothobranchius orthonotus          | Spotted Killifish        |
| Nothobranchius rachovii            | Rainbow Killifish        |
| Polysteganus undulosus             | Seventy-four Seabream    |
| Pristis zijsron                    | Longcomb Sawfish         |
| Varicorhinus <b>nelspruitensis</b> | Incomati Chiselmouth     |
| REPTILIA                           |                          |
| Bitis gabonica                     | Gaboon Adder             |
| Bitis schneideri                   | Namaqua Dwarf Adder      |
| Bradypodion taeniabronchum         | Smith's Dwarf Chameleon  |
| Cordylus cataphractus              | Armidillo Girdled Lizard |
| Crocodylus niloticus               | Nile crocodile           |
| Python natalensis                  | African Rock Python      |
| AVES                               |                          |
| Bucowus leadeateri                 | Southern Ground-Hombill  |
| Circus ranivorus                   | African Marsh Harrier    |
| Neotis denhami                     | Denham's Bustard         |
| Spheniscus demersus                | Jackass Penguin          |
|                                    |                          |
|                                    |                          |
| Atelerix frontalis                 | South African Hedgehog   |
| Ceratotherium simum                | White Rhinoceros         |
| Connochaetes gnou                  | Black Wildebeest         |
| Crocuta crocuta                    | Spotted Hyaena           |
| Felis nigripes                     | Black-footed Cat         |
| Parahyaena brunnea                 | Brown Hyaena             |
| Leptailurus serval                 | Serval                   |
| Loxodonta africana                 | African elephant         |
| Lutra maculicollis                 | Spotted-necked Otter     |
| Mellivora capensis                 | Honey Badger             |
| Memvora capensis                   | Honey Badger             |

| Redunca arundinum                | Reedbuck                 |
|----------------------------------|--------------------------|
| Vulpes chama                     | Cape Fox                 |
| FLODA                            |                          |
| FLORA Adenia wilmsii             | No common name           |
| Aloe simii                       | No common name           |
| Clivia mirabilis                 | "Oorlogskloof' Bush Lily |
| Disa macrostachya                | No common name           |
| Disa nubigena                    | No common name           |
| Disa physodes                    | No common name           |
| Disa procera                     | No common name           |
| Disa sabulosa                    | No common name           |
| Encephalartos altensteinii       | Bread Palm               |
| Encephalartos caffer             | Breadfruit Tree          |
| Encephalartos dyerianus          | Lowveld Cycad            |
| Encephalartosfriderici-guilielmi | No common name           |
| Encephalartos ghellinckii        | No common name           |
| Encephalartoshumilis             | No common name           |
| Encephalartos lanatus            | No common name           |
| Encephalartos l <b>ehmanni</b> i | No common name           |
| Encephalartos longifolius        | No common name           |
| Encephalartos natalensis         | Natal Giant Cycad        |
| Encephalartospaucidentatus       | No common name           |
| Encephalartosprinceps            | No common name           |
| Encephalartos senticos us        | No common name           |
| Encephalartos transvenosus       | Modjadje Cycad           |
| Encephalartos trispinosus        | No common name           |
| Euphorbia clivicola              | No common name           |
| Euphorbia <b>meloformis</b>      | No common name           |
| Euphorbia obesa                  | No common name           |
| Harpagophytumprocumbens          | Devil's Claw             |
| Harpagophytumzeyherii            | Devil's Claw             |
| Hoodia gordonii                  | Ghaap                    |
| Hoodia currorii                  | Ghaap                    |
| Protea odorata                   | Swartland Sugarbush      |
| Stangeria eriopus                | No common name           |

| Appendix 6: Environmental Incident Log and Complaint Form |
|---|
|   |

## **Environmental Log and Incident Report**

| Date | Environmental Incident | Notes- Include an explanation if possible for the condition / incident and persons responsible. Include photographic records and other material | Corrective Action Taken | Signature |
|------|------------------------|---|-------------------------|-----------|
|      |                        |   |                         |           |
|      |                        |   |                         |           |
|      |                        |   |                         |           |
|      |                        |   |                         |           |
|      |                        |   |                         |           |
|      |                        |   |                         |           |
|      |                        |   |                         |           |
|      |                        |   |                         |           |

## **Complaint Form**

| Complaint Record Sheet   |      | File No<br>Reference |         | Date |      |  |  |  |  |
|--------------------------|------|----------------------|---------|------|------|--|--|--|--|
| Complaint Lodged By      | /:   | Reference            |         |      |      |  |  |  |  |
| Capacity of Complainant  |      |                      |         |      |      |  |  |  |  |
| Complaint Logged by      |      |                      |         |      |      |  |  |  |  |
| Details of Complaint:    |      |                      |         |      |      |  |  |  |  |
|                          |      |                      |         |      |      |  |  |  |  |
|                          |      |                      |         |      |      |  |  |  |  |
|                          |      |                      |         |      |      |  |  |  |  |
|                          |      |                      |         |      |      |  |  |  |  |
|                          |      |                      |         |      |      |  |  |  |  |
|                          |      |                      |         |      |      |  |  |  |  |
|                          |      |                      |         |      |      |  |  |  |  |
|                          |      |                      |         |      |      |  |  |  |  |
|                          |      |                      |         |      |      |  |  |  |  |
| Proposed Remedial Action |      |                      |         |      |      |  |  |  |  |
|                          |      |                      |         |      |      |  |  |  |  |
|                          |      |                      |         |      |      |  |  |  |  |
|                          |      |                      |         |      |      |  |  |  |  |
|                          |      |                      |         |      |      |  |  |  |  |
|                          |      |                      |         |      |      |  |  |  |  |
|                          |      |                      |         |      |      |  |  |  |  |
|                          |      |                      |         |      |      |  |  |  |  |
|                          |      |                      |         |      |      |  |  |  |  |
|                          |      |                      |         |      |      |  |  |  |  |
|                          |      |                      |         |      |      |  |  |  |  |
|                          |      |                      |         |      |      |  |  |  |  |
| Notes by ECO / Auditor   |      |                      |         |      |      |  |  |  |  |
|                          |      |                      |         |      |      |  |  |  |  |
|                          |      |                      |         |      |      |  |  |  |  |
|                          |      |                      |         |      |      |  |  |  |  |
| ECO                      | Date |                      | Auditor |      | Date |  |  |  |  |
|                          | Date |                      | Auditoi |      | Date |  |  |  |  |
|                          |      |                      |         |      |      |  |  |  |  |
| Resident Engineer        | Date |                      |         |      |      |  |  |  |  |

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