ENVIRONMENTAL MANAGEMENT PROGRAMME

In terms of the National Environmental Management Act
National Environmental Management Act (Act No. 107 of 1998, as amended) & 2010
Environmental Impact Regulations

For

SONSKYNVALLEI HOUSING EXTENSION – PHASE 3

Portions 4, 59 & 105 of the Farm Hartenbosch 217, Erf 1853 & Erf 3122, Mossel Bay

Prepared for the Applicant: Mossel Bay Municipality
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ENVIRONMENTAL MANAGEMENT PROGRAMME

SONSKYNVALLEI HOUSING EXTENSION – PHASE 3
on
Portions 4, 59 & 105 of the Farm Hartenbosch 217, Erf 1853 & Erf 3122, Mossel Bay

Submitted for:
DEPARTMENTAL REVIEW

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Appendix B: Preferred Layout / Site Development Plan
Appendix C: Recycling Guidelines
Appendix D: Environmental Do’s and Don’ts Poster
### Glossary of Terms

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<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tr>
<td><strong>DEA</strong></td>
<td>Department of Environmental Affairs – the national authority for sustainable environmental management and integrated development planning.</td>
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<tr>
<td><strong>DEA&amp;DP</strong></td>
<td>Department of Environmental Affairs and Development Planning – the provincial authority for sustainable environmental management and integrated development planning.</td>
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<tr>
<td><strong>CARA</strong></td>
<td>Conservation of Agricultural Resources Act (Act 43 of 1983) - provides for control over the utilization of the natural agricultural resources of the Republic in order to promote the conservation of the soil, the water sources and the vegetation and the combating of weeds and invader plants; and for matters connected therewith.</td>
</tr>
<tr>
<td><strong>CBA</strong></td>
<td>Critical Biodiversity Area – An area designated over sensitive, vulnerable and endangered features or ecosystems, which remain relatively intact and are in need to protection.</td>
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<tr>
<td><strong>ECA</strong></td>
<td>Environment Conservation Act, 1989 - To provide for the effective protection and controlled utilization of the environment and for matters incidental thereto.</td>
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<tr>
<td><strong>ECO</strong></td>
<td>Ecological Control Officer – independent site agent appointed by a proponent to observe and enforce environmental policies and principles on a development site.</td>
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<tr>
<td><strong>EMP</strong></td>
<td>Environmental Management Programme – an environmental management tool used to ensure that undue or reasonably avoidable adverse impacts of the construction and operation, and decommissioning of a project are prevented and that positive benefits of the projects are enhanced.</td>
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<tr>
<td><strong>ESA</strong></td>
<td>Ecological Support Area – an area designated to support the ecological integrity of Critical Biodiversity Areas and/or sensitive ecosystems.</td>
</tr>
<tr>
<td><strong>NEMA</strong></td>
<td>National Environmental Management Act (Act 107 of 1998) – national legislation that provides principles for decision-making on matters that affect the environment.</td>
</tr>
<tr>
<td><strong>NEM:BA</strong></td>
<td>National Environmental Management: Biodiversity Act (Act 10 of 2004) - This Act controls the management and conservation of South African biodiversity within the framework of NEMA.</td>
</tr>
<tr>
<td><strong>NSBA</strong></td>
<td>National Spatial Biodiversity Assessment - assesses the state of South Africa’s biodiversity, across terrestrial, freshwater, estuarine and marine environments, emphasising spatial (mapped) information for both ecosystems and species.</td>
</tr>
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1 INTRODUCTION

Cape EAPrac (Pty) Ltd has been appointed as the independent Environmental Assessment Practitioner (EAP) responsible for facilitating the legally required Basic Assessment Environmental process for Phase 3 of the proposed housing development at Sonskynvallei on Portions 4, 59 & 105 of the Farm Hartenbosch 217, Erf 1853 & Erf 3122, Mossel Bay. This process is undertaken in terms of the National Environmental Management Act (NEMA, Act 107 of 1998, as amended)\(^1\).

The Mossel Bay Municipality, as the local authority, has a mandate and responsibility to provide in the housing need of those that cannot secure/afford accommodation. As part of this mandate the Municipality maintains a housing list of beneficiaries that qualify for assistance / subsidies and based on the demand the Municipality investigate and implements housing projects to address the housing backlog.

The above mentioned properties have been identified as suitable for one of their housing projects within the greater Mossel Bay area. The property falls within the urban edge of Mossel Bay and has been earmarked for future township expansion. Farm Portions 59 & 105 of the Farm Hartenbosch 217 and Erf 1853 are owned by the Mossel Bay Municipality. Erf 3122 and Portion 4 of the Farm Hartenbosch 217 are owned by the ATKV (Afrikaanse Taal- en Kultuurvereniging) who have granted the Applicant permission to conduct an environmental impact assessment and develop the property for the goal of subsidy housing opportunities. The properties are currently zoned as Agriculture I and Authority, thus re-zoning of the property is necessary.

The development site can be described as an undeveloped area located between a housing suburb to the east (existing Sonskynvallei Township), brickworks to the west, agricultural land to the north and a 'natural' area to the south. The five (5) properties that make up the development site cover an area of ±278ha in total. The proposed development will however have an approximate footprint of 33.76ha. The site is located approximately 2km west of the N2 between Hartenbos and Klein Brak, along the R328 that travels between Hartenbos and Oudtshoorn. Current access to the site is via an illegal access point directly off the R328 (at the Clinic and Community Centre) and Mandela Road (which is also accessed off the R328). The Traffic Impact Assessment recommended that primary access be via Mandela Road.

The current preferred development will make provision for the following:

- 616 Residential Zone (subsidy) erven
- 2 Transport Zone II erven
- 11 Public Open Space erven
- 2 Church erven
- 1 Crèche erf
- 1 Business erf
- 1 Authority erf

The following upgrades be made in order to service the proposed development:

- 1200kl capacity increase to the existing Hartenboskop reservoir
- Bulk water pipeline from the Hartenboskop reservoir to the proposed development
- New sewer rising main with pump station

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\(^1\) The National Environmental Management Act (Act 107 of 1998) was amended in 2006 and August 2010.
This **Environmental Management Programme (EMP)** contains management requirements and recommendations made by Cape EAPrac, participating specialists and stakeholders, as well as in terms of best practice. Should the future environmental authorisation contain requirements (conditions) that contradict any points in this EMP, the requirements (conditions) in the authorisation supersede this EMP. This EMP should be updated to include any additional recommendations that arise from the **Basic Assessment** process, as well as any conditions of authorisation should the project be authorised.

This **EMP** has been compiled with due consideration of Section 33 of NEMA (R543 of 2010 Regulations) and the *DEA&DP Guideline for Environmental Management Plans (October 2010)*. These requirements and recommendations make reference to **pre-construction, construction** and **operation activities** that are considered in terms of Environmental Management, Social, Heritage and Health & Safety requirements.

This EMP **must** be included in ALL tender and contract documentation associated with this project.

It must be noted that this EMP is relevant and **binding** not only on the activities taking place in and surrounding the settlement, but also for all associated infrastructure upgrades required in order for this development to be undertaken.

### 1.1 PROJECT PHASING

#### 1.1.1 Pre-construction Phase

The pre-construction phase of the development refers to the site preparation i.e. establishment of a site camp, demarcation of areas (for structures, services, no-go, storage etc.), plant rescue, topsoil stripping and storage etc.

#### 1.1.2 Construction Phase

The construction phase of the development refers to the earthworks associated with leveling the erven platforms and establishing the necessary retaining wall structures, as well as the actual construction of the civil works (installation of services and construction of roads).

#### 1.1.3 Operation Phase

The operational phase commences when occupancy of the re-established, serviced dwellings takes place on the formal erven. As the proposed formal erven have been designed to correspond as far as possible with the existing informal dwellings, it is likely that there may be an overlapping time period where activities will consist of both construction and operational activities.

#### 1.1.4 Closure and Decommission Phase

It is highly unlikely that a residential development within a residential area (inside the urban edge) will be subject to closure and decommission, even over the long term. As such, specific management recommendations related to decommissioning are not included with this EMP.
2 LEGISLATIVE REQUIREMENTS

The applicant, the Mossel Bay Municipality is required to comply with all necessary legislation, policies and guidelines. These include, but are not limited to:

2.1 ENVIRONMENT CONSERVATION ACT, 1989 (ECA)

The EIA regulations contained in the Environmental Conservation Act (ECA) have been replaced by the NEMA, however the provisions included in this legislation are still applicable. In particular, the contractor must comply with the draft regulations pertaining to noise as published in the province of Western Cape Provincial Extraordinary Gazette as provision made in section 25 of the ECA), as well as Section 24 of the ECA regarding waste management and Section 20 of the ECA dealing with waste management under Part IV, Control of Environmental Pollution. The transitional arrangements between the ECA and the NEMA, as well as the transitional arrangements for the various regulations published in terms of the NEMA are of importance and must be considered.

2.2 NATIONAL ENVIRONMENTAL MANAGEMENT ACT (NEMA, ACT 107 OF 1998)

The National Environmental Management Act (NEMA, Act 107 of 1998, as amended), makes provision for the identification and assessment of activities that are potentially detrimental to the environment and which require authorisation from the competent authority (in this case, the national Department of Environmental Affairs) based on the findings of an Environmental Assessment. It also embraces the notion of sustainable development as contained in the Constitution of South Africa (Act 106 of 1996) in that everyone has the right:

- to an environment that is not harmful to their health or wellbeing; and
- to have the environment protected for the benefit of present and future generations through reasonable legislative and other measures.

NEMA aims to provide for cooperative environmental governance by establishing principles for decision-making on all matters relating to the environment and by means of Environmental Implementation Plans (EIP) and Environmental Management Plans / Programmes (EMP).

Principles contained in Section 2 of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended (NEMA), which, amongst other things, indicates that environmental management should:

- In order of priority aim to: avoid, minimise or remedy disturbance of ecosystems and loss of biodiversity;
- Avoid degradation of the environment and avoid jeopardising ecosystem integrity;
- Pursue the best practicable environmental option by means of integrated environmental management;
- Protect the environment as the people’s common heritage;
- Control and minimise environmental damage; and
- Pay specific attention to management and planning procedures pertaining to sensitive, vulnerable, highly dynamic or stressed ecosystems.

It is incumbent upon the proponent to show how the proposed activities would comply with these principles and thereby contribute towards the achievement of sustainable development as defined by the NEMA.
2.3 NATIONAL ENVIRONMENTAL MANAGEMENT: BIODIVERSITY ACT (NEM:BA) (ACT 10 OF 2004)

This Act controls the management and conservation of South African biodiversity within the framework of NEMA. Amongst others, it deals with the protection of species and ecosystems that warrant national protection, as well as the sustainable use of indigenous biological resources. Sections 52 & 53 of this Act specifically make provision for the protection of critically endangered, endangered, vulnerable and protected ecosystems that have undergone, or have a risk of undergoing significant degradation of ecological structure, function or composition as a result of human intervention through threatening processes.

The entire development site falls within the Groot Brak Dune Strandveld, which have a National Spatial Biodiversity Assessment (NSBA) and NEM:BA Ecosystem Status of ENDANGERED, and protection level of ‘hardly protected’. The Botanical specialist study has indicated that the most conservation worthy vegetation is thicket patches located around the existing rugby field. This area around the rugby field is indicated as a Critical Biodiversity Area (CBA) Buffer, whilst a small section along the north western boundary is indicated as a CBA.

2.3.1 The National Spatial Biodiversity Assessment (NBA)(2011)

The NBA 2011 assesses the state of South Africa’s biodiversity, across terrestrial, freshwater, estuarine and marine environments, emphasising spatial (mapped) information for both ecosystems and species. The NBA is central to fulfilling the South African National Biodiversity Institute’s (SANBI) mandate in terms of the National Environmental Management: Biodiversity Act (Act 10 of 2004) to monitor and report regularly on the state of biodiversity, and includes two headline indicators that are assessed across all environments: ecosystem threat status and ecosystem protection level. Information from the NBA can thus be used to streamline environmental decision-making, strengthen land-use planning, strengthen strategic planning about optimal development futures for South Africa, and identify priorities for management and restoration of ecosystems with related opportunities for ecosystem-based job creation.

In terms of this development proposal, the ecosystem status and condition of the vegetation types in proximity to the site, as well as the nearest priority ecosystems: the Hartenbos River Estuary, have been considered. In addition, the location of the development site in relation to the nearest Critical Biodiversity Area, Ecosystem Support Areas, National Protected Area Expansion Strategy (NPAES) and National Freshwater Ecosystem Priority Areas (NFEPA) have been considered in the Basic Assessment process.

2.3.2 Garden Route Biodiversity Sector Plan (GRBSP)

A Biodiversity Sector Plan (BSP) provides a way forward in reconciling the conflict between development and the maintenance of natural systems. It provides biodiversity information needed for land-use planning and decision-making and other multi-sectoral planning processes (between Cape Nature / SANParks, DEA&DP and Department of Water Affairs, district and local municipalities etc.). Central to the Garden Route BSP is the Critical Biodiversity Area (CBA) Map, which together with its associated guidelines and GIS maps, have been consulted in the assessment of this development proposal.

2.4 NATIONAL WASTE MANAGEMENT STRATEGY


2.5 DEA&DP WASTE MINIMISATION GUIDELINE DOCUMENT FOR ENVIRONMENTAL IMPACT ASSESSMENT REVIEWS (MAY 2003)

This Guideline raises awareness to waste minimisation issues and highlights waste and wastage minimization practices. Part B of this document is of particular importance, as it addresses issues of general waste and wastage minimization during construction activities.

2.6 SANS 10400 APPLICATION OF THE NATIONAL BUILDING REGULATIONS

The application of the National Building Regulations contains performance parameters relating to fire safety, sanitation systems, moisture penetration, structural safety, serviceability and durability. It also takes into account how the above can be established to reflect social expectations in a manner which supports sustainable development objectives.

2.7 NATIONAL BUILDING REGULATIONS

The National Building Regulations and Building Standards Act as amended must be complied with. This act addresses, inter alia:
- Specifications for draftsmen, plans, documents and diagrams;
- Approval by local authorities;
- Appeal procedures;
- Prohibition or conditions with regard to erection of buildings in certain conditions;
- Demolition of buildings;
- Access to building control officers;
- Regulations and directives; and
- Liability.

2.8 NATURE & ENVIRONMENTAL CONSERVATION ORDINANCE (19 OF 1974)

This legislation was developed to protect both animal and plant species within the various provinces of the country which warrant protection. These may be species which are under threat or which are already considered to be endangered. The provincial environmental authorities are responsible for implementing the provisions of this legislation, which includes the issuing of permits etc. In the Western Cape, Cape Nature fulfills this mandate.

2.9 CONSERVATION OF AGRICULTURAL RESOURCES ACT (CARA)

CARA provides for the regulation of control over the utilisation of the natural agricultural resources in order to promote the conservation of soil, water and vegetation and provides for combating weeds and invader plant species. The Conservation of Agricultural Resources Act defines different categories of alien plants:
- Category 1 - prohibited and must be controlled;
- Category 2 – must be grown within a demarcated area under permit; and
• Category 3 - ornamental plants that may no longer be planted, but existing plants may remain provided that all reasonable steps are taken to prevent the spreading thereof, except within the floodlines of water courses and wetlands.

There is **alien plant species** within the proposed development area and surrounding the Sonskynvallei Township, which will require control and/or removal. **Recommendations in terms of alien plant removal / control**, as well as **erosion control (and rehabilitation)** have been included in this Environmental Management Programme (EMP).

### 2.10 NATIONAL WATER ACT (NWA) (NO 36 OF 1998)

Section 21c & i of the National Water Act (NWA) requires that authorisation be applied for from the Department of Water Affairs (DWA) for any activity in, or in proximity to any watercourse. A new water pipeline will have to be constructed to service the proposed Phase 3 extension. This upgrade was indicated in the Civil Services Report. The impact of this drainage line crossing by the proposed bulk water line is assessed in the Basic Assessment process.

### 2.11 NATIONAL FOREST ACT (ACT 84 OF 1998)

In terms of regulation 15 of the aforesaid act, no person may:

(a) cut, disturb, damage, destroy or remove any protected tree; or

(b) collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree, except under a License granted by the Minister.

### 2.12 NATIONAL VELD & FOREST FIRE ACT (NVFFA) (ACT 101 OF 1998)

The purpose of the National Veld and Forest Fire Act is to **prevent and combat veld, forest and mountain fires** throughout the Republic of South Africa and to provide institutions, methods and practices for achieving this purpose. Institutions include the formation bodies such as Fire Protection Associations (FPA's) and Working on Fire. The Act provides the guidelines and constitution for the implementation of these institutions, as well as their functions and requirements.

Every owner on whose land a veldfire may start or burn or from whose land it may spread must prepare and maintain a **firebreak** on his or her side of the boundary between his or her land and any adjoining land. The procedure in this regard and the role of adjoining owners and the fire protection association are dealt with within this Act.

### 2.13 NATIONAL HERITAGE RESOURCES ACT (ACT 25 OF 1999)

The protection and management of South Africa’s heritage resources are controlled by the National Heritage Resources Act (Act No. 25 of 1999). Heritage Western Cape (HWC) is the enforcing authority in the Western Cape, and is registered as a Stakeholder for this environmental process.

In terms of Section 38 of the National Heritage Resources Act, HWC will comment on the proposal, as the following activities are relevant:

- **the construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length**;
• any development or other activity which will change the character of a site exceeding 5 000 m² in extent;

Furthermore, in terms of Section 34(1), no person may alter or demolish any structure or part of a structure, which is older than 60 years without a permit issued by the HWC, or the responsible resources authority. No buildings older than 60 years or with heritage significance were identified within the proposed development area.

Nor may anyone destroy, damage, alter, exhume or remove from its original position, or otherwise disturb, any grave or burial ground older than 60 years, which is situated outside a formal cemetery administered by a local authority, without a permit issued by the SAHRA, or a provincial heritage authority, in terms of Section 36 (3). No grave sites were found within the proposed development area.

In terms of Section 35 (4), no person may destroy, damage, excavate, alter or remove from its original position, or collect, any archaeological material or object, without a permit issued by the SAHRA, or the responsible resources authority.
3 PRE CONSTRUCTION & OPERATIONAL DESIGN CONSIDERATIONS

The recommendations made below are those that require consideration in the detailed design phase of the development. These design phase considerations need to be included in all relevant engineering drawings and specifications provided to the contractors.

3.1 ENERGY CONSERVATION

The implementation of certain energy saving mechanisms is strongly recommended. The responsibility for ensuring implementation of these conservation measures lies with the Mossel Bay Municipality. Resource efficiency within the settlement must be promoted. For this purpose, it is recommended that all erven / dwellings be fitted with energy efficient / saving technology. Many of these require inclusion during the design phase of the development and are as follows:

3.1.1 Energy saving systems

It is recommended that consideration be given to the use of solar water-heating / geyser technology, should subsidy housing be implemented as a later phase of the settlement upgrade.

3.1.2 Energy efficient lighting

The Mossel Bay Municipality will / must provide suitable street-lighting. It is strongly recommended that energy saving lighting fixtures be used throughout the entire settlement. Energy efficient type street lighting (luminaires) must be introduced, positioned according to the final design. Streetlights should also be controlled by day/night switches to ensure that all lights will be switched off during the day. No incandescent lights should be used and all security lights should be controlled with motion sensors. Only Compact Fluorescent Lights (CFL) and Sodium Vapour (SV) lamps should be utilised.

In addition, it is recommended that Light Emitting Diodes (LEDs) be considered as opposed to incandescent lighting. These could be used for all internal and external lighting, including street lighting. NO external High Pressure Sodium (HPS) or Metal Halide (MH) spot or floodlights are to be installed.

Although it is not mandatory, it should be considered to install proximity switches in areas where lighting for pedestrians is required.

3.2 WATER CONSERVATION

The basic assessment report has recommended that water conservation measures be included and implemented. The following must be included in the design of all service infrastructure to be installed by the Municipality:

3.2.1 Dual Flush Toilets

Conservative estimates have shown that a saving of more than 22 000 liters per household can be achieved annually with the installation of dual flush toilets (Aquanotion, 2008). Considering this with the proposed number of erven within the proposed settlement, a significant annual water saving could be expected.

3.2.2 Low flow shower heads

The installation of low flow shower heads can not only reduce water consumption by up to 50%, but also the energy required for water heating by up to 50% (Eartheasy, 2008).

It has been estimated that a saving of up to 57 000 liters of water per annum per household can be achieved through the installation of low flow shower heads.
Low flow shower heads make use of either aerators or pulse systems to reduce the flow without compromising the quality of the shower. The choice of shower head is up to the facility operator, but must have a flow of less than 7 liters per minute.

3.2.3 Low flow faucets

Low flow faucets use aerators to reduce the flow of the water. These are either built into the faucet or added as an aftermarket product. The faucets in bathrooms should have a peak flow of less than 10 liters per minute.

3.2.4 Geyser and pipe insulation

Apart from the savings in terms of energy as detailed above, insulating geysers and pipes save water, as shorter periods of running the tap to get hot water are required. The Contractor responsible for installing the water supply / geysers should be required to install geyser and pipe insulation.

3.2.5 Waterwise Landscaping

Although it is unlikely that the municipal budget set aside for the upgrade of this settlement includes landscaping and gardens, the following recommendations are provided as guiding principles for any such activities:

- All alien vegetation must be removed prior to any civil works and/or landscaping with indigenous vegetation. Ongoing monitoring and regular follow-up of alien clearing must take place over the long-term of operation to ensure that alien plants do not re-establish.
- Grow water-wise plants – generally the best suited plants are those indigenous to the area, as they seldom need additional watering;
- Group plants according to their water needs – this avoids wasting water on plants that don’t need it;
- Consider the quantity and type of the lawn. Lawns guzzle water, thus lawn areas should be reduced to a minimum. A tougher, drought-tolerant lawn type should be selected, such as Buffalo (coastal areas) or Kweek (inland) rather than Kikuyu.
- Maintain the garden – remove unwanted plants, plant more perennials than summer annuals, as they have deeper root systems and so need less watering.
- Improve the soil and mulch. Soil water-holding capacity is improved by higher organic matter content. Mulching (covering the soil with a thick layer of bark, compost, straw etc.) keeps the soil much more moist.
- Gardens should only be watered with water from rainwater tanks or grey water.

3.3 PRE-CONSTRUCTION ENVIRONMENTAL COMPLIANCE WORKSHOP

It is required that a pre-construction environmental compliance workshop be undertaken before any construction commences on site. This workshop can be combined with a site handover meeting, but must take place before any activities take place on site and before any plant is moved onto site.

The following people must be present at this Environmental Compliance Workshop:

- The ECO;
- The Main Civil Contractor (including contract manager, site agent and foreman);
- The Electrical Contractor (including contract manager, site agent and foreman);
- The Consulting Engineers (electrical, civil and structural, whichever applicable); and
- Project Management.
Provision should be made to attend a 2 hour workshop that will be chaired by the ECO. The provisions of this EMP and the conditions of the Environmental Authorisation will be discussed in detail at this workshop.
4 CONSTRUCTION ENVIRONMENTAL MANAGEMENT

4.1 ECOLOGICAL CONTROL OFFICER

It is recommended that an Environmental Control Officer (ECO) be appointed for the erven formalization and service installation activities at the settlement site. The appointed ECO must be suitably qualified and have experience in environmental monitoring and control on similar projects.

The responsibilities of the ECO include but are not limited to the following:

- Provide environmental induction training with Contractors staff on-site prior to commencing of construction activities;
- Maintenance, update and review of the EMP;
- Liaison between the Project Proponent, Contractors, authorities and other lead stakeholders on all environmental concerns, including the implementation of the EMP;
- Compilation of Environmental Control Report (ECR) to ensure compliance with the EMP and authorisations. Reports should be submitted to the Mossel Bay Municipality on a 3 monthly basis;
- Compilation of the Environmental Audit Report or Environmental Completion Statement, six months after completion of construction;
- Monitor compliance with this EMP;
- Monitor compliance with the Environmental Authorisation (if authorised);
- Monitor implementation of the mitigation and rehabilitation measures and recommendations referred to in the Basic Assessment Report and this EMP;
- Recommend the issuing site instructions to the Contractor for corrective actions required (formal site instructions are to be issued by the Engineer’s Representative with input from the ECO);
- ECO site inspections to be undertaken once a week to ensure compliance with the EMP. The duration of these visits may be increased or decreased at the discretion of the ECO in consultation with the Engineers Representative;
- Attendance of contractors site meetings;
- Maintain a record of environmental incidents (e.g. spills, impacts, legal transgressions etc.) as well as corrective and preventative measures taken. This information must also be included in the ECR;
- Maintain a public complaints register in which all complaints and action taken must be recorded. This information must also be included in the ECR; and
- The ECO in conjunction with the Engineers Representative has the authority to stop work on site if he / she consider that any actions of excessive non-compliance of the EMP, authorisations or General Duty of Care are taking place.

4.2 PLANT RESCUE & PROTECTION PLAN

Plants of conservation value, found during the pre-construction site assessment to occur in areas to be disturbed during construction or movement across the site, should be conserved in situ as far as possible. If such conservation is not possible, these plants should be carefully removed (with as much of the roots as possible) and bagged and stored in a suitably protected area (area to be excluded from construction activities) for use in rehabilitation and landscaping activities. These plants should be used for the rehabilitation of the open space areas / recreational park within or surrounding the proposed formal settlement, as to be directed by the ECO.
4.3 REHABILITATION AND MANAGEMENT OF OPEN SPACE

All areas identified as open space must be demarcated during construction to avoid unwanted encroachment or access. The areas should ideally be marked with explanatory signage that should remain at the site post construction to enable future residents to also understand the value of the open space area and/or conservation potential.

4.4 ALIEN INVASIVE MANAGEMENT PLAN

Alien vegetation within the settlement site mainly occurs within the Thicket patches. The dominant invader in these thicket patches is rooikrans (*Acacia cyclops*). Other alien plants also occur throughout the proposed development area however these are few and far between.

It is recommended that all alien invasion plants be removed. Where necessary it is recommended that this removal process be undertaken by hand (chainsaws, slashers, tree-poppers, hand pulling etc.), and that topical herbicides be applied to tree stumps to prevent coppicing / re-growth. Disturbance to the soil must be limited, therefore roots and stem stumps of cut trees must be left in situ, where possible.

The thicket patches on the north-west boundary of the proposed development site (the patches excluded from the development area) must be focused on in terms of alien plant clearing. This vegetation is connected to adjacent thicket patches and considered valuable in terms of conservation. Also the thicket patches around the rugby field.

This initial removal of any invasive vegetation within the proposed development area should take within 3 months of commencement of construction.

It is recommended that the community of Sonskynvallei be informed of the importance of the natural vegetation surrounding their neighbourhood and that only invasive alien vegetation be harvested for fire wood and not indigenous vegetation.

4.4.1 Long term invasive alien plant management

It is recommended that a long-term alien plant removal programme be developed to guide the systematic removal of alien plants within the proposed development site as well as the area south of the development site which the Botanical specialist recommended be conserved. This long-term programme must be developed in consultation with CapeNature, Mossel Bay Municipality and the Department of Forestry (in line with the Working-for-Water and Working-on-Fire programmes which may be active in the area).

The following measures must be implemented as a minimum:

- Clearing of invasive vegetation must take place by **hand only** (chainsaws, slashers, tree-poppers, hand pulling etc.);

- **No heavy machinery** (bull-dozers, excavators, trackers etc.) in proximity to drainage lines and sensitive vegetation;

- Cut stumps are to be treated with a suitable herbicide to prevent coppicing and regrowth;

- **Disturbance** to the soil must be **limited**, therefore roots and stem stumps of cut trees must be left in situ, where possible;

- To minimise **fire risk**, all cut material must be taken out of the rehabilitation area and either removed from site or chipped for use in pathways within the settlement etc.;

- Care should be taken to curb the spread of seed when removing and disposing of the cut material.
4.5 FIRE MANAGEMENT AND PROTECTION

The type and state (disturbed nature, and alien plant biomass) of the vegetation found in proximity to the site could potentially pose a fire risk associated with uncontrolled wild / forest fires.

The following points should be considered with regards to fire protection for the settlement and the drainage line itself:

- A key component of the abovementioned alien invasive plant removal programme should be the total removal of all invasive alien vegetation material to decrease the fire risk associated with the accumulation of biomass. Under no circumstances should bulk biomass be burned on-site;
- Construction staff and residents should be made aware of potential fire risks – cigarette butts and unsupervised fires. For e.g. cigarette butts may not be thrown in the veld, but must be disposed of correctly. The contractor with input from the ECO must designate smoking areas during construction (in compliance with the Tobacco Products Control Amendment Act 63 of 2008) with suitable receptacles for disposal.
- In case of an emergency, the contact details of the local fire and emergency services must be readily available (sign-posted within the Contractor site camp and within the settlement (perhaps beside the shop or churches);
- Contractors and the Municipality must ensure that basic fire fighting equipment is available on site as per the specifications defined by the health and safety regulations;
- No fires should be allowed in proximity to any drainage line; and
- The fire risk on site and fire-fighting training must be a point of discussion as part of the environmental induction training prior to commencement of construction and as part of general settlement management meetings between the Municipality and the community.

4.6 RE-VEGETATION / REHABILITATION PLAN

The potential rehabilitation of disturbed areas within the settlement, the public open space areas and the banks of adjacent drainage systems, can stimulated and fast-tracked by the physical planting of locally occurring indigenous plants. To do this, the plant species selected should be those that will attract fauna (particularly birds) able to promote further natural seed dispersion and pollination. This may be limited, to a large extent, by the pedestrian movement requirements between the dwellings within the settlement layout, but can be promoted within the larger public open space / recreational area over the old dumpsite and along the adjacent drainage line to the east of the site.

The following trees should be considered for use in the open space. These are to be used in addition to the plants rescued for transplant prior to construction.

- *Ekebergia capensis* (Cape Ash)
- *Grewia occidentalis* (Cross-berry)
- *Virgillia oroboides* (Keurboom)
- *Burchellia bubalina* (Wild Pomegranate)
- *Buddleja salviifolia* (Sagewood)
- *Halleria lucida* (Tree Fuchsia)
- *Syzygium cordatum* (Water Berry)
- *Nuxia floribunda* (Forest Elder)
- *Afrocarpus falcatus* (Outeniqua Yellowwood)
- *Afrocarpus latifolius* (Real Yellowwood)
- *Celtis africana* (White Stinkwood)

The tree planting within the settlement, in public open spaces and along the banks of the drainage lines, is to take place immediately after the initial invasive vegetation removal and should be completed before the finalisation of the Civil Contract. Input from CapeNature, SANParks and the Department of Forestry must be sought for confirmation of the plant species.

### 4.7 EROSION CONTROL & STORMWATER MANAGEMENT

The design of the formal stormwater infrastructure must ensure that discharge / outlet points must be contained within the site boundaries of the settlement and be designed in such a way as to negate erosion. The stormwater outlets should contain suitable energy dissipating structures designed to reduce water energy, dispersing the water rather than concentrating it. In addition, the stormwater infrastructure should serve to promote run-off infiltration and soak-away, to allow sub-surface seepage, rather than surface flow. All stormwater outlets must be fitted with litter traps, which must be cleaned on a regular basis by the Municipality to avoid obstruction and contamination of stormwater leaving the site. The final positioning of these structures should be determined by the engineer in consultation with the Municipality and the ECO.

The stormwater design has been developed by the consulting engineer with specific focus on avoidance and remedying the effects of erosion. This stormwater system consist of three legs, namely:

- A minor system (piped system)
- A major system (overland via roads and open space using various attenuation techniques)
- An Emergency system (provision of continuous overland flow routes)

The contractor is responsible for implementation of the stormwater management plan, as well as the temporary measures that are required during construction, until the final system is in place.

Any areas that are identified by the ECO as being prone to erosion must be suitably protected with for e.g. silt fencing and/or sand bags during the earthworks / construction period. During construction, the Contractor shall protect all areas susceptible to erosion by installing necessary temporary and permanent drainage works as soon as possible and by taking any other measures necessary to prevent stormwater from concentrating in streams and scouring slopes, banks, etc.

Any erosion channels found to exist within the settlement or that develop during construction on steep slopes must be backfilled, compacted and restored to an acceptable condition.

Stabilisation of cleared areas to prevent and control erosion and/or sedimentation shall be actively managed. The most suitable method of stabilisation shall be determined in consultation with the ECO. Consideration and provision shall be made for the following methods (or combination thereof):

- retaining cut slopes with the installation of permanent retaining wall structures,
- brush-cut packing,
- mulch or chip cover,
- straw stabilising,
- planting of vegetation,
- soil binders and anti-erosion compounds,
- mechanical cover or packing structures (including the use of geofabric, log/pole fencing) &
- installation of biddum or shadecloth silt screens.

Prospective contractors must make provision for these in their tenders.
Traffic and movement over stabilised areas shall be restricted and controlled, and damage to stabilised areas shall be repaired and maintained to the satisfaction of the ECO.

In areas where construction activities have been completed and where no further disturbance would take place, rehabilitation and re-vegetation should commence as soon as possible.

The Contractor shall, as an ongoing exercise, implement erosion and sedimentation control measures to the satisfaction of the ECO.

See Appendix A, Figure 1 & 2 showing diagrammatic representations of proposed erosion control on the site.

4.8 TOPSOIL HANDLING

In terms of best practice and for rehabilitation purposes, it is essential that any topsoil stripped or removed for the levelling and stabilization of the erven sites, must be stockpiled for further use during rehabilitation activities post construction. Topsoil can be temporarily stored at the abandoned quarry site directly to the north of the development site. Cut-to-spoil subsoil must be removed from site and disposed of at the nearby quarry site allocated by the Municipality for this purpose. Topsoil is of utmost importance for use in rehabilitation of disturbed areas and should therefore under no circumstances be mixed with sub-soils or any building material (clay, gravel or building sand/stone).

The following requirements regarding topsoil handling must be considered:

- A minimum 150mm layer of topsoil from the entire development footprint should be stripped and stockpiled;
- The topsoil stockpile site must be approved by the ECO and may not be within the 30m of any watercourse (and off-site drainage line);
- The topsoil may not be stockpiled within any of the remaining natural areas;
- The topsoil stockpile must be protected from erosion as indicated by the ECO (silt fences etc.); and
- The topsoil must be replaced into disturbed areas (road verges etc.) on completion of construction.

4.9 NOISE CONTROL

It is recommended that noise generation be kept to a minimum and that construction activities be confined to normal working hours (08:00 - 17:00 on workdays). And 8:00 – 14:00 on Saturdays. No construction should be allowed on Sundays and public holidays.

Apart from confining noise to the normal hours as detailed above, the following noise abatement (reduction of intensity and amount) measures should be implemented:

- Construction vehicles adhering to approved access routes and minimum speed limits;
- Strict operation times and periods for construction works;
- Adherence to the National Building Regulations and Section 25 of ECA to minimise noise impacts;
- Provide baffle and noise screens to noisy machines as necessary;
- Provide absorptive linings to the interior of engine compartments;
- Ensure machinery is properly maintained (fasten loose panels, replace defective silencers);
- Switch off machinery immediately when not in use; and
- Reduce impact noise by careful handling of equipment and machinery.
The Contractor shall be responsible for compliance with the relevant legislation with respect to noise *inter alia* Section 25 of ECA.

### 4.10 WASTE MANAGEMENT

It is recommended that an **integrated waste management** approach must be adopted and implemented, based on waste **minimization**. The section below deals specifically with the **construction waste management** requirements. The **operational** waste management requirements are detailed further on in this report.

Only **approved** waste disposal methods will be allowed. The Contractor shall ensure that fenced / enclosed waste storage site be established within or adjacent to the Site Camp (scavenger proof) and that all site **personnel** are instructed in the proper **disposal** of all waste. The Contractor shall ensure that sufficient disposal facilities (refuse bins and cigarette butt receptacles) are available.

The contractor is to familiarize themselves with the requirements of the **National Environmental Management Waste Act**. **NO** activities listed in terms of this Act may commence without a **Waste License**.

**Recycling** must be encouraged on site and recycling bins must be provided at the **contractor’s camp** and clearly marked. It is recommended that **local community** leaders be contacted to identify groups or individuals who may benefit from the disposal of recyclable material and scrap metal if any.

**Disposal** of all waste materials must be done at **suitable facilities**. **No illegal dumping** of any waste material on or off site is permitted. The **disposal** of all **general waste** must take place at a **licensed landfill**.

#### 4.10.1 Solid Waste

The **Contractor** shall ensure that all facilities are maintained in a **neat** and **tidy** condition and the site shall be kept free of **litter**. Measures shall be taken to **reduce the potential for litter** and negligent behaviour with regard to the disposal of all refuse. At all places of work the Contractor shall provide litterbins, containers and refuse collection facilities for later disposal. There should be litterbins within each construction area.

Solid waste that **cannot** be recycled or re-used may be temporarily stored on site in a designated area approved by the ECO prior to collection and disposal. Ideally, this designated refuge area should be within the contractor’s site camp. Solid waste must be removed on a **weekly** basis to a licensed waste disposal site. Recyclable waste should be recycled whenever possible.

**Waste storage containers** shall be covered, **tip-proof, weatherproof** and **scavenger proof**. The waste storage area shall be **fenced off** to prevent wind-blown litter.

**No burning, on-site burying** or **dumping** of waste shall occur. **Used** (empty) **cement bags** shall be collected and stored in **weatherproof containers** to prevent windblown cement dust and water contamination. **Used** cement bags may **not** be used for any other purpose and shall be disposed of on a **weekly basis** via the solid waste management system.

All solid waste shall be disposed of offsite at a **licensed** landfill site. The Contractor shall supply the ER and ECO with **certificates of disposal**.

#### 4.10.2 Construction Rubble and Waste

All construction **rubble** must be disposed of at an approved site (no construction rubble may be spoiled anywhere on site or adjacent to site). **NO** construction rubble may be used as fill in **landscaping** or any other areas on site.
4.10.3 Scrap Metal

Recycling of scrap metal is recommended. Scrap metal must be disposed of offsite at suitable facilities.

4.10.4 Hazardous Waste

Any potentially hazardous waste (including bitumen, fuel, oils, paints etc.) shall be disposed of at approved hazardous landfill site. The Contractor shall provide disposal certificates to the ECO.

Waste containing oils / paint thinners etc. must be kept separate from the general waste stream, sealed in a drum and collected and disposed of by a recognised service provider at a licensed hazardous waste site (e.g. Vissershok, Cape Town). Used oil and grease must be removed from site to an approved used oil recycling company.

Unused or rejected tar or bituminous products must be returned to the supplier’s production plant. Under NO circumstances may tar, bituminous or paint products be spoiled on the site.

Where possible, the maintenance of vehicles should take place off site.

4.11 SANITATION

Chemical ablution facilities must be available for the use by construction staff for the duration of the construction period. The following must therefore be implemented:

- Toilet and hand washing facilities must be available to the site personnel at all times. These must be situated in the site camp;
- One toilet for every 15 personnel is required;
- Portable ablution facilities may not be positioned within 50m of the off-site drainage line to the east of the site;
- The facilities must be serviced on a regular basis to prevent any spillage;
- The servicing contractor must dispose of the waste in an approved manner;
- The ECO must be provided with the service providers’ details and the service schedule for the site;
- The toilets should be secured to ensure that they do not blow over in windy conditions;
- All toilet facilities must be removed from site on completion of the contract period; and,
- Should the construction period be interrupted by a builders break, the toilets should be emptied prior to the break.

4.12 DEMARCATION OF WORK AREAS

The demarcation of no-go areas is of extreme importance to ensure that damage is restricted to the future developed area and that areas outside this demarcated area are protected and not damaged unnecessarily.

The process for this is as follows:

- The exact footprint of the construction area to be surveyed and pegged. This must be done during the pre-construction phase for all roads and services and dwelling structure footprints;
- The contractor in conjunction with the ECO must walk the areas determined and mark the full extent of the area to be disturbed (allowing sufficient space for the construction activity);
- This disturbance is to be clearly marked with a double strand of wire with danger tape placed between strands as detailed in Appendix A, Figure 4;
- All areas outside this demarcated area are considered as “no-go” areas for any construction; and,
- Any drainage line in proximity to the site must be demarcated as a “no-go” area.
- Construction staff must be briefed as part of the environmental induction on the requirements regarding the no-go areas.

4.13 ENVIRONMENTAL AWARENESS AND TRAINING

The ECO in consultation with the contractor shall ensure that adequate and on-going environmental awareness training of senior site personnel takes place and that all construction workers receive an induction presentation on the importance and implications of the EMP. The presentation shall be conducted, as far as is possible, in the employees’ language of choice.

As a minimum, training should include:

- Explanation of the importance of complying with the EMP;
- Discussion of the potential environmental impacts of construction activities;
- The benefits of improved personal performance;
- Employees’ roles and responsibilities, including emergency preparedness;
- Explanation of the mitigation measures that must be implemented when carrying out their activities;
- Explanation of the specifics of this EMP and its specification (no-go areas, fire policy, waste management and others); and
- Explanation of the management structure of individuals responsible for matters pertaining to the EMP.

The contractor must keep records of all environmental training sessions, including names, dates and the information presented. Details of the Environmental Induction must be included in the Environmental Control Report as submitted to the DEADP.

4.14 CONCRETE BATCHING

Cement powder has a high alkaline pH that may contaminate and adversely affect both soil pH and water pH negatively. A rapid change in pH can have consequences on the functioning of soil and water organisms as well as on the botanical component.

Concrete batching may only take place in areas approved by the ECO. Concrete mixing areas must have bund walls or a settling pond in order to prevent cement run off. Once the settling ponds dry out, the concrete must be removed and dispatched to a suitable disposal site. Ideally, all concrete batching should take place on an area that is to be hard surfaced as part of the development (possibly within the future road surface or within the footprint of a future building).

In order to avoid resource contamination, concrete batching should not be located within 60m of watercourses or where there is a potential for any spilled concrete to enter a watercourse or groundwater. In the event that no alternative location is available, the location and condition thereof must be confirmed in consultation with the ECO and strict measures taken to prevent contamination of the area.

If an area outside of the site camp is identified for batching it must first be approved by the ECO and all topsoil must be stripped and stockpiled for reuse.

Batching at satellite sites must be done on a batching plate i.e. wood or metal sheet, to prevent soil and water contamination. This is particularly important at the sites of the stormwater outlets.
4.15 FUEL STORAGE

The above-ground storage of fuel is subject to authorization in terms of the National Environmental Management Act (NEMA as amended 2006) if more than 30m³ is stored on site at any one time.

Should a temporary fuel storage facility be required, the Contractor must ensure that he/she complies with legislation and that the following measures are in place:

- Temporary fuel storage must take place within the contractors site camp in an area approved by the ECO;
- No storage of fuel may take place on any other portion of the site;
- Mobile fuel units used to refuel plant on site must make use of drip trays when refueling;
- Double lined storage tanks should be used;
- All storage tanks must be ISO 9001 certified;
- Storage facilities may not be located within 60m of a watercourse or where there is a potential for any spilled fuel to enter a watercourse or groundwater;
- Fuel storage facilities should be located on flat ground. No cut and fill should take place immediately on or adjacent to fuel storage areas;
- Bund walls must be constructed to contain at least 110% of the total capacity of the storage tanks;
- Bund walls must be constructed of impermeable material or lined to ensure that petroleum products cannot escape;
- A suitable material should be placed in the base of the bund walls to soak up any accidental spillages;
- The tanks should be locked and secured when not in use;
- Automatic shut-off nozzles are required on all dispensing units;
- Storage tanks should be drained within one week of completion of activities (unused fuel can be used by the contractor on other work sites or returned to the supplier). If the construction program extends over the Christmas shutdown, the contractor must ensure that storage tanks are emptied prior to this period;
- All storage tanks, containers and related equipment should be regularly maintained to ensure the safe storage and dispensing of fuel. The Engineer is to sign off on the condition suitability of the storage tanks;
- Defective hoses, valves and containment structures should be promptly repaired;
- Vehicle and equipment fuelling should be undertaken on a hard impermeable surface or over drip pans to ensure spilled fuel is captured and cleaned up; and
- The area must be totally rehabilitated on completion of the contract and all contaminated material must be taken to a licensed dumping site for that purpose.

4.16 DUST MANAGEMENT

Every effort to minimize dust pollution on the site must be undertaken especially considering the properties in close location. Construction vehicles must adhere to speed limits and minimization of haul roads must be implemented. During dry, dusty periods haul roads should be kept dampened to prevent excess dust. No potable water may be used for damping haul roads.

As an alternative, products such as road environment dust suppressants (Reds) would be recommended in order to minimize the use of water for controlling dust pollution. This is to be determined by the ECO during construction as required.

Exposed stockpile materials (e.g. topsoil or building sand) must be adequately protected against wind (covered), and should be sited taking into consideration the prevailing wind conditions.
Please see attached Appendix A, Figure 3 showing a diagrammatic representation of the management of haul roads to the site.

4.17 ESTABLISHMENT OF CONTRACTORS SITE CAMP

The Contractors Site Camp must be established in consultation with the ECO. The site camp may not be erected on any areas considered sensitive and no indigenous vegetation may be removed, damaged or disturbed without consent from the ECO. The following points are applicable:

- The Contractors Site Camp must be situated within the development area, but further than 60m from the off-site drainage line. Off-site Site Camps may only be erected once written permission from the landowner is obtained and any other necessary authorisations are in place.
- Topsoil from the site camp area must be stripped and stockpiled for re-use during rehabilitation. This must be done to ensure no contamination of the topsoil while the site camp is in use.
- The temporary fuel storage in the construction site camp must be bunded to allow for the capturing of spilt fuel before it infiltrates into the subsurface, preventing spilt fuel from entering the stormwater systems, thus avoiding the risk of contamination of both surface and groundwater systems.
- The site camp must be fenced off with shade netting.
- All construction material must be stored in the site camp, unless otherwise approved by the ECO.
- No personnel may overnight in the site camp, except in the case of a night watchman / security.
- Fires for cooking and/or heating are only allowed within the site camp after consultation with the Health and Safety Representative.
- Fuel may only be stored in the camp site.
- Storage of waste must take place within the site camp and must be removed on a regular basis.
- The site camp must be provided with sufficient ablution facilities (toilets and potable water) of which the content must be disposed of regularly and at the suitable facilities.

4.18 ACCESS / TRAFFIC MANAGEMENT DURING CONSTRUCTION

The management of construction traffic is vital to ensuring the safety of the existing and future road network within and in the vicinity of the development, as well as fostering a good relationship between the developer and the residents of the surrounding area.

- Conflicts between construction vehicles and public vehicles should be minimised and priority given public vehicles.
- Access to areas on the site where construction is taking place should be restricted by means of signage.
- Liaison should take place with the local residents and the Mossel Bay Municipality regarding construction traffic concerns.
- Information such as notices and letters could be extended to those residents that will be directly affected directly.
- Construction traffic should be restricted to daylight hours, and outside peak traffic times in the morning and afternoon.
4.19 TEMPORARY LIGHTING DURING CONSTRUCTION

Regarding the temporary lighting during construction, the following refers:

- Lighting on site is to be sufficient for safety and security purposes only, but shall not be intrusive to on-site or neighbouring residents, disturb wildlife, or interfere with road traffic;
- Should overtime/night work be authorised, the contractor shall be responsible to ensure that lighting does not cause undue disturbance to on-site or neighbouring residents; and
- Only low flux and low frequency lighting shall be utilised.

4.20 THEFT AND OTHER CRIME

An increase in crime during the construction phase is an always an area of concern, particularly in instances where construction takes place with an established residential area. Theft and other crime associated with construction sites is not only a concern for surrounding residents, but also the developer and the contractor.

Considering this, contractors need to be pro-active in order to curtail theft and crime on and resulting from the construction site. It is recommended that the contractor develop a jobsite security plan prior to commencement of construction. This jobsite security plan should take into account protection of the construction site from both internal and external crime elements as well as the protection of the surrounding communities from internal crime elements. All incidents of theft or other crime should be reported the South African Police Service, no matter how seemingly insignificant. A copy of the jobsite security plan should be included in the first environmental control report to be submitted to the DEADP. The site demarcation/fencing during construction, should be of a nature to curtail access into the Contractor Site Camp after hours and it is recommended that a security guard be placed on duty during after-hours and weekends.

5 SOCIAL REQUIREMENTS

5.1 USE OF LOCAL LABOUR

It is strongly recommended that the contractor make use of local labour as far as possible for the construction phase of the project.

Records should be kept of all personnel under the main contract, as well as those under any subcontractors employed by the contractor.

The main contractor must provide the breakdowns of their contract, as well as all sub-contractors. The following criteria for classification must be recorded and submitted to the ECO and the Engineer.

<table>
<thead>
<tr>
<th>Staff Type</th>
<th>Local to the Mossel Bay Area</th>
<th>SCape (excluding the Mossel Bay Area)</th>
<th>Outside the Southern Cape</th>
<th>The Southern Cape</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Percentage</td>
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<tr>
<td>Semi-skilled</td>
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<tr>
<td>Operators</td>
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<tr>
<td>Senior Management</td>
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</tbody>
</table>
Apart from the labour records detailed above, financial records should be kept indicating the financial contribution to the local economy through the input into wages and the use of local suppliers.

6 HERITAGE REQUIREMENTS

Should any heritage remains be exposed during excavations, these must be immediately reported to the Provincial Heritage Resource Authority of the Western Cape, namely Heritage Western Cape in terms of the national Heritage Resources Act (Act No. 25 of 1999). Heritage remains uncovered or disturbed during earthworks may not be disturbed further until the necessary approval has been obtained from Heritage Western Cape.

Should any archaeological remains including (but not limited to) fossil bones, fossil shells, coins, indigenous ceramics, colonial ceramics, marine shell heaps, stone artifacts, bone remains, rock art, rock engravings and any antiquity be discovered during construction, they must be immediately reported to Heritage Western Cape and not disturbed further until the necessary approval has been obtained.

7 METHOD STATEMENTS

Method statements are written submissions by the Contractor to the Engineer and ECO in response to the requirements of this EMP or to a request by the Engineer or ECO. The Contractor shall be required to prepare method statements for several specific construction activities and/or environmental management aspects.

The Contractor shall not commence the activity for which a method statement is required until the Engineer and ECO have approved the relevant method statement.

Method statements must be submitted at least five (5) days prior to the date on which approval is required (start of the activity). Failure to submit a method statement may result in suspension of the activity concerned until such time as a method statement has been submitted and approved.

An approved method statement shall not absolve the Contractor from any of his obligations or responsibilities in terms of the contract. However, any damage caused to the environment through activities undertaken without an approved method statement shall be rehabilitated at the contractor’s cost.

Additional method statements can be requested at the ECO’s discretion at any time during the construction phase.

The method statements shall cover relevant details with regard to:

- Construction procedures and location of the construction site.
- Start date and duration of the procedure.
- Materials, equipment and labour to be used.
- How materials, equipment and labour would be moved to and from the site as well as on site during construction.
- Storage, removal and subsequent handling of all materials, excess materials and waste materials of the procedure.
- Emergency procedures in case of any reasonably potential accident / incident which could occur during the procedure.
- Compliance / non-compliance with the EMP Specification and motivation if non-compliant.

7.1 METHOD STATEMENTS REQUIRED:

Based on the specifications in this EMP, the following method statements are likely to be required as a minimum: (more method statements may be requested as required at any time under the direction of the ECO)

- Site clearing;
- Hazardous substances declaration of use;
- Cement and concrete batching;
- Traffic accommodation (if necessary);
- Solid waste control system;
- Wastewater / stormwater control system;
- Erosion remediation and stabilisation;
- Fire control and emergency procedures;
- Petroleum, chemical, harmful and hazardous materials; and
- Alien vegetation-clearing programme.

8 OPERATIONAL REQUIREMENTS

The operational requirements of this EMP are to be updated to include the recommendations and comments received in response to the Final Basic Assessment Report.

8.1 ENVIRONMENTAL MAINTENANCE MANAGEMENT PROGRAMME (EMMP)

The Mossel Bay Municipality and residents of the settlement will be responsible for the operational management of the township – the following must be considered:

- The Mossel Bay Municipality must ensure that the conditions of the Environmental Authorisation are adhered to;
- Energy efficiency measures to reduce energy and water consumption as described in this EMP are implemented on all future dwellings;
- The management of the Public Open Spaces within the residential development, which includes the follow-up eradication and prevention of further encroachment of alien invasive plant species as specified in of this EMP, must be continued and monitored into the future. For this reason the Mossel Bay Municipality must insist that only local indigenous plant species be planted in all gardens, landscaped and rehabilitated areas.
- The systematic removal of alien vegetation from, and rehabilitation of the adjacent watercourse, should form part of the on-going management programme which identifies and removes existing alien vegetation, as well as prohibiting the introduction of new or potential alien plant species from within the settlement.
- Consultation with the local fire fighting authorities is needs to take place in order to ensure the site is adequately equipped to fight a fire should such an event occur. This refers to the establishment and maintenance of firebreaks. Working on Fire and the local Fire Protection Association (FPA) needs to be contacted.
- Regular monitoring of the settlement and its immediate surround are (especially the off-site watercourse) for evidence of erosion must be a key component of the proposed EMMP. Should any signs of erosion be identified, the source of such erosion must be immediately rectified and disturbed area rehabilitated as soon as possible.
• **Community meetings**, with Ward Councillors and Municipal officials, are recommended, in which existing and new residents of the area are encouraged to separate their household waste so that it may be disposed of via recycling and general waste streams, as well as notified of need to protect and rehabilitate the adjacent drainage line, plant indigenous vegetation and implement water/energy conservation strategies.

### 8.2 WASTE MANAGEMENT DURING OPERATION

Effective **management** of household **waste** contributes to a more **sustainable** implementation of **landfill** sites and their management. **Sorting** of recyclable materials at the **source**, i.e. in each household, causes less backlog at the landfill site and decreases the availability of material so required by scavengers to the dump site. Using biodegradable waste in a garden compost heap or an earthworm farm is far more supportive of the environment than disposing of it in the general waste.

#### 8.2.1 Recycling

It is recommended that **recycling bins** be placed at a **central point** in the settlement, with access for all residents to encourage recycling of most of the general household waste that is produced. Bins need to be **adequately marked** for ease of reference (e.g. Glass, Plastic, Paper, Metal etc.). The **Mossel Bay Municipality** should enter into an **agreement** with a **local recycling** organisation for collection of these materials.

#### 8.2.2 Use / Disposal of Alien Invasive Plant Biomass

In accordance with the recommended long-term alien invasive plant removal programme, alien plant biomass may **not be disposed** of in any **open space** area, nor the adjacent drainage line. Unwanted germination of seed in natural areas and accumulation of fire-prone biomass is to be prevented at all costs. The Mossel Bay Municipality must take the responsibility of **removing** such biomass to a suitable disposal site and/or chipping the woody material for use of pedestrian pathways etc. Where there is sufficient space and/or mechanisms in place, such biomass should be **composted**. **No burning** of removed alien plant material on-site is permitted.

#### 8.2.3 Biodegradable Refuse

Households produce large amounts of **biodegradable** refuse that can easily be recycled to produce **compost**. Compost provides a rich source of nutrients for plants, both indoors and out. The residents of the area should be encouraged by the Municipality to implement methods for recycling household biodegrade waste for use in their subsistence vegetable gardens and fruit orchards.

More information can be obtained from the Urban Sprout Green Directory on [www.urbansprout.co.za](http://www.urbansprout.co.za).

### 9 HEALTH AND SAFETY

The contractor must ensure **compliance** with the Occupational Health and Safety Act (No. 85 of 1993). Of key importance is the following (Section 8 of the aforesaid Act):

**General duties of employers to their employees**

1. **Every employer shall provide and maintain, as far as is reasonably practicable, a working environment that is safe and without risk to the health of his employees.**

2. **Without derogating from the generality of an employer’s duties under subsection (1), the matters to which those duties refer include in particular-**
(a) the provision and maintenance of systems of work, plant and machinery that, as far as is reasonably practicable, are safe and without risks to health;
(b) taking such steps as may be reasonably practicable to eliminate or mitigate any hazard or potential hazard to the safety or health of employees, before resorting to personal protective equipment;
(c) making arrangements for ensuring, as far as is reasonably practicable, the safety and absence of risks to health in connection with the production, processing, use, handling, storage or transport of articles or substances;
(d) establishing, as far as is reasonably practicable, what hazards to the health or safety of persons are attached to any work which is performed, any article or substance which is produced, processed, used, handled, stored or transported and any plant or machinery which is used in his business, and he shall, as far as is reasonably practicable, further establish what precautionary measures should be taken with respect to such work, article, substance, plant or machinery in order to protect the health and safety of persons, and he shall provide the necessary means to apply such precautionary measures;
(e) providing such information, instructions, training and supervision as may be necessary to ensure, as far as is reasonably practicable, the health and safety at work of his employees;
(f) as far as is reasonably practicable, not permitting any employee to do any work or to produce, process, use, handle, store or transport any article or substance or to operate any plant or machinery, unless the precautionary measures contemplated in paragraphs (b) and (d), or any other precautionary measures which may be prescribed, have been taken;
(g) taking all necessary measures to ensure that tire requirements of this Act are complied with by every person in his employment or on premises under his control where plant or machinery is used;
(h) enforcing such measures as may be necessary in the interest of health and safety;
(i) ensuring that work is performed and that plant or machinery is used under the general supervision of a person trained to understand the hazards associated with it and who have the authority to ensure that precautionary measures taken by the employer are implemented; and
(j) causing all employees to be informed regarding the scope of their authority as contemplated in section 37 (1) (b).

The Occupational Health and Safety Act aims to provide for the health and safety of persons at work and for the health and safety of persons in connection with the activities of persons at work and to establish an advisory council for occupational health and safety.

The main contractor must ensure compliance with the Occupational Health and Safety Act. The main contractor must ensure that all sub-contractors comply with the Occupational Health and Safety Act.

9.1 EMERGENCY RESPONSE PLAN

An emergency response plan must be developed for the incidents of fire and leakage of the sewerage reticulation system. This plan should be developed by the Municipality and should, as a minimum, include the following:

- Placing of firefighting equipment;
- Training of staff;
- Awareness raising of emergency procedures amongst residents; and
- Monitoring and maintenance program.

The development of the settlement must comply with all relevant norms relating to the design, construction, monitoring and maintenance of road, water, sewerage, stormwater and electrical
systems, as well as emergency facilities / services, to avoid circumstances which could expose the environment as well as the public to contamination, health or safety risks.
10 RESPONSIBILITIES
Details of the organizational structure are presented in Figure 2. The structure illustrates the reporting procedures for stakeholders in the implementation of this EMP.

**Figure 2:** EMP implementation organizational structure during construction.

11 IMPLEMENTATION SCHEDULE
This EMP is applicable to all construction activities at the settlement, Sonskynvallei, Mossel Bay. The following summary of the implementation of the key environmental management requirements must be adhered to.

<table>
<thead>
<tr>
<th>TASK</th>
<th>RESPONSIBILITY</th>
<th>TIMEFRAME</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appointment of Contractors</td>
<td>Contracting Engineer / Client</td>
<td>Prior to Construction</td>
</tr>
<tr>
<td>Demarcation of No Go Areas</td>
<td>ECO &amp; Main Contractor</td>
<td>Prior to Construction commencing and duration</td>
</tr>
<tr>
<td>Establishment of Site Camp</td>
<td>Contractors</td>
<td>Prior to Construction</td>
</tr>
<tr>
<td>Environmental Awareness and Induction</td>
<td>ECO</td>
<td>Prior to Construction commencing and duration</td>
</tr>
<tr>
<td>Health and Safety Protocol</td>
<td>Contractor / Health and Safety Officer</td>
<td>Duration of contract</td>
</tr>
<tr>
<td>Attendance of Site Meetings</td>
<td>Project Proponent / Contracting Engineer / Contractor / ECO / Health and Safety Officer</td>
<td>Duration of contract</td>
</tr>
<tr>
<td>Ablution Facilities</td>
<td>Contractor</td>
<td>Duration of contract</td>
</tr>
<tr>
<td>Waste Management</td>
<td>Contractor</td>
<td>Duration of contract</td>
</tr>
<tr>
<td>Plant Rescue</td>
<td>ECO</td>
<td>Duration of contract</td>
</tr>
<tr>
<td>Topsoil Stripping</td>
<td>Contractor</td>
<td>Duration of contract</td>
</tr>
<tr>
<td>Activity</td>
<td>Responsible Party</td>
<td>Duration of Contract</td>
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<tr>
<td>----------------------------------------------</td>
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<tr>
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<td>Duration of contract</td>
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<td>Fuel Storage</td>
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<td>Noise Control</td>
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<td>Dust Management</td>
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<td>Erosion Control</td>
<td>Contractor</td>
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<td>Non-compliance</td>
<td>ECO / Relevant Authority</td>
<td>Duration of contract</td>
</tr>
<tr>
<td>Compliance with all environmental management requirements</td>
<td>All role players</td>
<td>Duration of contract</td>
</tr>
</tbody>
</table>

### 12 NON-COMPLIANCE

Any person is liable on conviction of an offence in terms of sub regulation (1) of the National Environmental Management Act (NEMA) to imprisonment for a period not exceeding two years or to a fine not exceeding an amount prescribed in terms of the Adjustment of Fines Act, 1991 (Act No. 101 of 1991).

It is the responsibility of the ECO and the Engineers representative to report any non-compliance to the relevant authority.

### 13 MONITORING

**Monitoring** of the construction progress must be done by means of photographic documentation by the ECO. This information must be included in the Environmental Control Report/s as detailed above.

Furthermore, it is a recommendation that an **audit** be undertaken **6 months** after completion of construction to monitor the rehabilitation of the site, and off-site drainage system, and to assess any possible impacts that may have occurred. This audit should be considered as the **Environmental Completion Statement** for the construction phase.

### 14 IMPLEMENTATION SCHEDULE

A project programme for the construction phase will be developed by the Engineer at a later stage. Provisions of this EMP must be included in the detailed project programme.
15 REFERENCES


