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ENVIRONMENTAL MANAGEMENT PROGRAMME

In terms of the **National Environmental Management Act**

(NEMA, Act 107 of 1998, as amended 2006 & 2010)

For

RE Capital 2 – Grid Connection

Prepared for the Applicant: **RE Capital 2 (Pty) Ltd**

Prepared By: **Cape *EAP*rac** Report Reference: **RAM332/04**

DEA Reference: **14/12/16/3/3/1/1306**

DEA Case Officer: **Nonhlahal Mkhwanzi**

Report Date: **18 February 2016**

ENVIRONMENTAL MANAGEMENT PROGRAMME

RE Capital 2 – Grid Connection

Submitted for:

DEPARTMENTAL REVIEW

Report Issued by:

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TABLE OF CONTENTS

Glossary of Terms

CARA	**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.
CBA	**Critical Biodiversity Area** – An area designated over sensitive, vulnerable and endangered features or ecosystems, which remain relatively intact and are in need to protection.
DEA	**Department of Environmental Affairs** – the national authority for sustainable environmental management and integrated development planning.
ECA	**Environment Conservation Act, 1989** - To provide for the effective protection and controlled utilization of the environment and for matters incidental thereto.
ECO	**Ecological Control Officer** – independent site agent appointed by a proponent to observe and enforce environmental policies and principles on a development site.
EMPr	**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.
ESO	**Environmental Site Officer**- The ESO is employed by the Contractor and monitors daily compliance with the EMPr on-site during the construction phase and reports to the ECO on environmental matters relating to construction.
ESA	**Ecological Support Area –** an area designated to support the ecological integrity of Critical Biodiversity Areas and/or sensitive ecosystems.
NEMA	**National Environmental Management Act (Act 107 of 1998)** – national legislation that provides principles for decision-making on matters that affect the environment.
SAHRA	**South African Heritage Resource Agency** – national heritage authority to provide input on project / process.

1 INTRODUCTION

***C*ape *EAP*rac (Pty) Ltd** has been appointed as the independent Environmental Assessment Practitioner (EAP) responsible for facilitating the legally required Basic Assessment Environmental process for the proposed **RE Capital 2 - Grid Connection** This process is undertaken in terms of the National Environmental Management Act (NEMA, Act 107 of 1998, as amended)[1]. The Proponent is **RE Capital 2 (Pty) Ltd.**

This Environmental Management Programme (EMPr) 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 EMPr, the requirements (conditions) in the authorisation supersede this EMPr. This EMPr 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 **EMPr** has been compiled with due consideration of Section 33 of NEMA and relevant guidelines for Environmental Management Plans. These requirements and recommendations make reference to **pre-construction**, **construction**, **operation activities** and decommissioning phases.

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

This EMPr must be read in conjunction with the following supplementary plans:

- EMPR for the main facilities (RE Capital 2 solar development)
- Plant Rescue and Protection Plan.
- Re Vegetation and Restoration Plan.
- Alien Vegetation Management Plan.
- Open Space Management Plan.

2 ACTIVITY PROPOSED

The main components of the powerline infrastructure / activity are as follows:

1. The proposed **132kV overhead powerline** will be ‘held-up’ / supported across the landscape by a series of **pylon structures (**Guyed and free-standing monopole structures) This power line will connect the on-site sub stations to the existing zeerust substation, There will be a **foundation at the foot of each pylon structure**. These pylon foundations are usually re-enforced concrete blocks (onto which the pylon is attached). The pylon foundations are considered to be the footprint/s of the overhead powerline and their related location is flexible to a degree. It must be noticed that these pylon footprints will not be constructed within 32m of any of the main watercourses.

[1] The National Environmental Management Act (Act 107 of 1998) was amended in 2006 and August 2010.

2. **Access tracks** under the overhead powerline to allow for construction of pylons and maintenance of the power line during operation. These will be **"double strip" jeep tracks** (not gravel roads) similar to the existing ones used by the farmers.
3. **Facility Substation.** Construction of the facility substation.

2.1 POWERLINE ALIGNMENT ALTERNATIVES

Alternative 3 as described in the Final Basic Assessment Report, as per the sketch below is to be implemented.

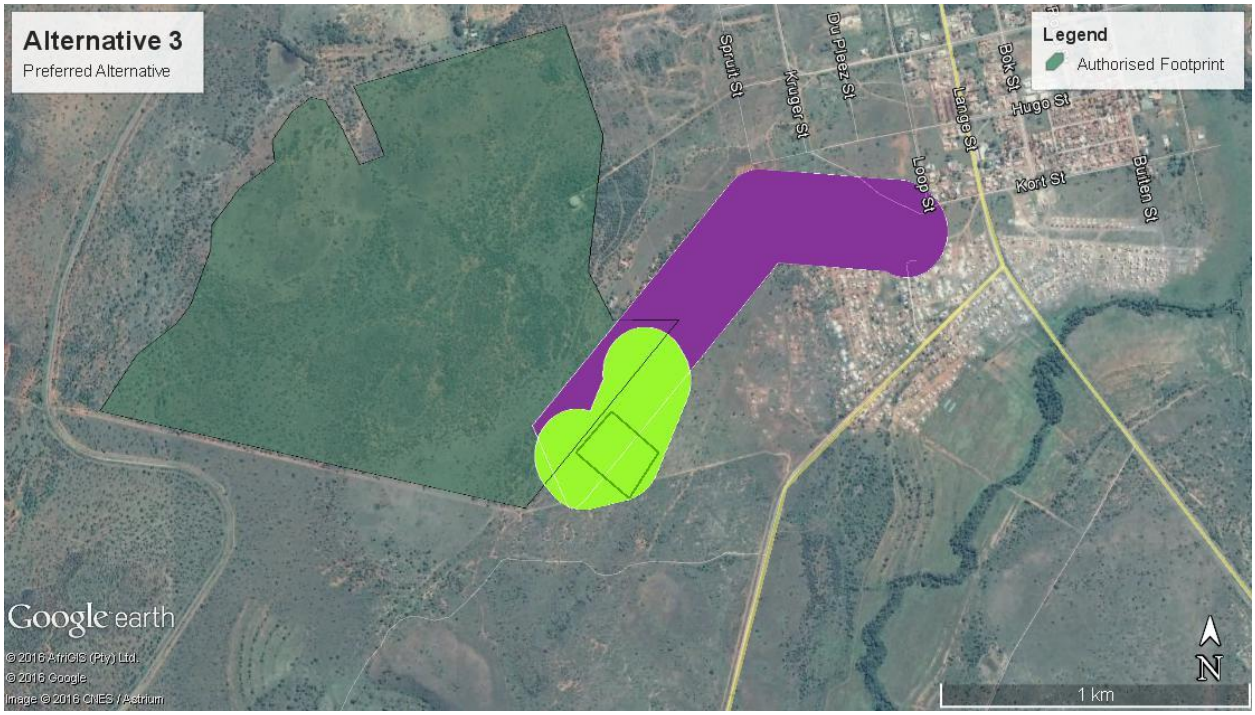

Figure 1: Preferred Alternative - Alternative 3 substation and powerline corridors

2.2 PROJECT PHASING

2.2.1 Pre-construction Phase

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

2.2.2 Construction Phase

The construction phase of the development refers to the earthworks associated with construction of the pylon foundations / footings, as well as the actual construction of the powerline. .

2.2.3 Operation Phase

The operational phase commences when the powerline are complete and electricity generated by the solar development is transmitted via this distribution infrastructure to the Zeerust substation.

2.2.4 Decommission Phase

Although the life-span of the associated PV may not extend beyond 30-years, it is unlikely that the powerline infrastructure will be completely decommissioned, as it may be included in the

electrical distribution network for the area. As such, specific management recommendations related to decommissioning are not included with this EMPr. Should the line have to be decommissioned then a Decommissioning plan will have to be developed and approved by the DEA before decommissioning can commence.

3 LEGISLATIVE REQUIREMENTS

The applicant, RE Capital 2 (Pty) Ltd., is required to **comply** with all necessary **legislation**, **policies** and **guidelines**. These include, but are not limited to:

3.1 ENVIRONMENT CONSERVATION ACT, 1989 (ECA)

The **EIA** regulations contained in the Environmental Conservation Act (ECA) have been replaced by the NEMA, however **Section 25** of the ECA, pertaining to the **management of noise**, vibration and shock, is still applicable and must be complied with by the Contractor. Section 20 and Section 24, dealing with waste management have been replaced by the National Environmental Management: Waste Act and the Waste Norms and Standards. 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.

3.2 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 (**EMPr**).

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.

3.3 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.

3.3.1 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.

3.4 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.

As specified by the ESKOM Environmental Procedure for Clearance and Maintenance within Overhead Powerline Servitudes (May 2013), alien vegetation in servitudes shall be managed in terms of the Regulation GNR.1048 of 25 May 1984 (as amended) issued in terms of the Conservation of Agricultural Resources Act (Act 43 of 1983). In Terms of these regulations, Eskom shall "control" i.e. to combat category 1, 2 and 3 plants to the extent necessary to prevent or to contain the occurrence, establishment, growth, multiplication, propagation, regeneration and spreading such plants within servitude areas or land owned by Eskom.

Recommendations in terms of alien plant removal / control have been included in this Environmental Management Programme (EMPr).

3.5 NATIONAL WATER ACT (NWA) (NO 36 OF 1998)

Section 21 of the National Water Act (NWA) requires that authorisation be applied for from the Department of Water Affairs (DWA) for any water use / activity in, or on the banks, of any

watercourse. Water use activities listed in Sec 21 which may be applicable to this project are as follows:
(c) impeding or diverting the flow of water in a watercourse;
(i) altering the bed, banks, course or characteristics of a watercourse.

In terms of the NWA a 'watercourse' is defined as:
(a) a river or spring;
(b) a natural channel in which water flows regularly or intermittently;
(c) a wetland, lake or dam into which, or from which, water flows; and
(d) any collection of water which the Minister may, by notice in the Gazette, declare to be a watercourse, and a reference to a watercourse includes, where relevant, its bed and banks.

The proposed RE Capital 2 – Grid Connection will not likely require authorization in terms of the National Water Act. The Department of Water and Sanitation must be approached to provide confirmation in this regard.

3.6 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.

The Botanical specialist has confirmed that no species protected in terms of the National Forest Act are present on site.

3.7 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.

3.8 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).
In terms of Section 38 of the National Heritage Resources Act, 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 ECPHRA, or

the responsible resources authority. **No buildings older than 60 years and heritage significance were identified along the powerline route.**

- 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 proposed powerline alignment corridor.**
- 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. **Please refer to Section 7 below for recommendations compiled to guide the construction activities.**

3.9 NATIONAL WASTE MANAGEMENT STRATEGY

The National Waste Management Strategy presents the South African government's strategy for **integrated waste management** for South Africa. It deals among others with: Integrated Waste Management Planning, Waste Information Systems, Waste Minimisation, Recycling, Waste Collection and Transportation, Waste Treatment, Waste Disposal and Implementing Instruments. In terms of this strategy, the measures must be implemented to ensure that waste generation is minimized and waste is re-used or recycled as far as possible. Please note however, containers of hazardous substances (such as paint thinners, fuel, oils etc.), as well as empty cement bags may not be used for any other purpose and must be disposed of in an appropriate manner (see Section 5.10 below).

3.10 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. These regulations are applicable specifically to the construction of the Substation / Switching Station Buildings (i.e. the two on site substations)

3.11 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.

These regulations are applicable specifically to the construction of the on-site substations.

4 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.

4.1 CONFIRMATION OF REQUIREMENTS IN TERMS OF THE NATIONAL WATER ACT

As the powerline alignments were assessed in the environmental process, no Master Layout Plan or Approval Civil Design Drawings, indicating position of the pylon structures were available during the process, as these would only to compiled during the micro-siting / final design phase post Environmental Authorisation (EA).

Master Layout Plans / Civil Design Drawings compiled during the micro-siting / final design phase ***post*** **Environmental Authorisation**, must be considered to ensure that they do not require additional authorization in terms of the National Water Act. As mentioned previously, the pylon footprints and maintenance tracks may not be constructed within 32m of a watercourse or plains wash.

4.2 ESTABLISHMENT & MAINTENANCE OF ACCESS TRACKS

The establishment of access tracks along the proposed powerline alignment (and the associated vegetation clearing activities), as well as demarcation and clearing of proposed pylon positions and laydown areas for pylon structures and other material, forms part of the pre-construction phase. However several construction and operational / maintenance requirements must be kept in mind when establishing these areas. The following measures must be adhered to / considered in the planning and establishment of the above:

- The access tracks for use during construction and operation must **make use of existing farm tracks, fence lines and fire breaks** as far as possible i.e. new or parallel access tracks should be avoid where possible and should not cross to adjoining areas, so as to prevent unnecessary damage to vegetation.
- Attention should be paid to access tracks on gradients. Where possible align tracks along contours and implement suitable **erosion measures** (for wind and water erosion) where necessary. These erosion control measures (diversion berms, brush-packing etc.) must be designed in such a way that they will serve into the long-term and can easily be maintain;
- **Remove any and all alien vegetation** along the chosen powerline alignment and maintenance track route for the **entire width of the servitude (minimum width of 32m)** of the transmission line (to avoid the risk of wild-fires damaging the powerline). It is critical that this alien plant biomass should not be burned or stored on-site. Instead, this biomass should be cut and chipped, and the chipped material lain down within the powerline servitude and access tracks. Under no circumstances may this chipped material be dumped or moved outside of the powerline servitude. As this material will contain seeds and there is already a seed bank present, a strict monitoring and follow-up programme must be implemented to ensure that any regrowth is controlled.

- A **buffer of 32m from the bank of any stream, dam or wetland** must be maintained. I.e. no built access tracks, or pylons (no physical construction activities – no-go), may be positioned or enter this 32m buffer area from the main watercourses.
- Should **trimming or felling of tall trees / bushes** be required (although this is unlikely due to the vegetation type) for spanning of the powerline during construction and/or maintenance of the powerline during operation, these activities may **only be done by hand** (i.e. with chainsaws, axes etc. – no vehicles or large machinery (bull-dozers or front-end loads).
- In the event of exposing human remains older than 60 years during construction, the matter will fall into the domain of South African Heritage Resources Agency (Mrs. Collette Scheermeyer) and will require a professional archaeologist to undertake mitigation if needed. Such work will also be at the cost of the developer.
- If archaeological or palaeontological materials are exposed during vegetation clearing and/or earth moving activities, then they must be dealt with in accordance with the National Heritage Resources Act (No. 25 of 1999) and at the expense of the developer.
- **No permanent marking** of rocks or trees to gain line of site.
- The **ECO** should inspect the switching station sites, and proposed access tracks and pylon positions during the **pre-construction** phase, prior to any land clearing or excavation activities, to confirm that there are no plants of conservation value that may have been dormant during the initial site assessment. Should it become necessary, the **ECO** may recommend a **plant rescue programme** be implemented and that the necessary Threatened or Protected Species (in terms of Chapter 4 of NEM:BA) (TOPs) permits be obtained for the translocation of protected species.

4.3 ENERGY CONSERVATION

The implementation of certain **energy saving mechanisms** is strongly recommended. The only likely need for lighting as part of this powerline development may be security lighting at the on-site substations, for which the following considerations apply:

4.3.1 Energy efficient lighting

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 security lighting. **NO** external **High Pressure Sodium** (HPS) or **Metal Halide** (MH) spot or floodlights should be installed.

4.4 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, ESO 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 **EMPr** and the conditions of the **Environmental Authorisation** will be discussed in detail at this workshop.

5 CONSTRUCTION ENVIRONMENTAL MANAGEMENT REQUIREMENTS

5.1 ENVIRONMENTAL CONTROL OFFICER

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 **EMPr**;
- **Liaison** between the Project Proponent, Contractors, authorities and other lead **stakeholders** on all environmental concerns, including the implementation of the EMPr;
- Compilation of **Environmental Control Report** (ECR) to document progress of construction in relation to compliance with the EMPr and authorisations. Reports should be submitted to the Holder of the Environmental Authorisation on a 3 monthly basis, and discussed during site meetings with Contractors;
- Compilation of the **Environmental Audit Report** or Environmental Completion Statement, six months after completion of construction;
- Monitor **compliance** with this **EMPr**;
- 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 **EMPr**;
- Recommend the issuing of **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 every two weeks** to ensure compliance with the **EMPr and EA**. The duration of these visits may be increased or decreased at the discretion of the ECO in consultation with the Engineers Representative;
- Interact with the ESO and ensure that the ESO is monitoring all environmental compliance on site and keeping a diary of any incidents and reporting these to the ECO as soon as is possible;
- Attendance of **contractors site meetings**;
- Maintain a record of **environmental incidents** (as identified by the ECO and recorded by the ESO) (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 EMPr, authorisations or General Duty of Care are taking place.

5.2 BOTANICAL REQUIREMENTS DURING CONSTRUCTION

The linear character of overhead power-lines is such that they would normally affect only a limited amount of vegetation on the ground. The access track/s required for construction and

maintenance of the powerline will have the greatest negative effect on vegetation. For this reason existing tracks, fence line, firebreaks and fields must be used as far as possible.

Recommended mitigation measures for the RE Capital 2 – Grid Connection are as follows (implement in conjunction with measures specified in Section 4.1 above):

- **Remove any and all alien vegetation** along the chosen powerline alignment and maintenance track route for the **entire width of the servitude** of the transmission line (to avoid the risk of wild-fires damaging the powerline). It is critical that this alien plant biomass should not be burned or stored on-site. Instead, this biomass should be cut and chipped, and the chipped material lain down within the powerline servitude and access tracks. Under no circumstances may this chipped material be dumped or moved outside of the powerline servitude. As this material will contain seeds and there is already a seed bank present, a strict monitoring and follow-up programme must be implemented to ensure that any regrowth is controlled.
- **Encourage re-growth of vegetation** in areas where alien invasive vegetation has been removed from the dune landscape. This could be achieved by brush-cutting small areas of undisturbed areas of natural vegetation nearby of the same type,
- **Maintain 32m buffer on watercourses**. No construction of pylons or access tracks should occur within a zone closer than 32 m from the watercourse and plains washes.
- Should **trimming or felling of tall trees / bushes** be required for maintenance of the powerline, these activities may **only be done by hand** (i.e. with chainsaws, axes etc. – no vehicles or large machinery (bull-dozers or front-end loaders)).
- **No fires or open flames** should be permitted in construction areas since the vegetation is highly flammable and wildfires could occur.
- Mix **all concrete and cement at approved batching sites** along the powerline alignment and remove excess from the construction sites since this material alters the pH of the soil and can influence the surrounding vegetation. A Method Statement should be compiled prescribing all standard measures for mixing, using, cleaning implements & disposing of excess / waste concrete & waste water. Measures stipulated in the EMPr, whether concrete is mixing on batching plates or imported as redi-mix, must be strictly adhered to.
- Pay attention to the gradient of access tracks and implement **suitable erosion measures** (for wind water erosion) where necessary.

As mentioned above, it is recommended that the **ECO** inspect the switching station sites, and proposed access tracks and pylon positions during the **pre-construction** phase, prior to any land clearing or excavation activities, to confirm that there are no plants of conservation value that may have been dormant during the initial site assessment. Should it become necessary, the **ECO** may recommend a **plant rescue programme** be implemented and that the necessary Threatened or Protected Species (in terms of Chapter 4 of NEM:BA) (TOPs) permits be obtained for the translocation of protected species.

5.3 PLANT RESCUE & PROTECTION PLAN

Should any Threatened or Protected Species (in terms of Chapter 4 of NEM:BA) (TOPs) be found during the pre-construction site inspection, the necessary TOPS permits must be obtained. Plants of conservation value, found during the pre-construction site assessment in areas to be disturbed during the establishment of access tracks, switching station sites or pylon positions, should be carefully removed (with as much of the roots as possible) and either

transplanted in a suitable area out of the construction footprint, but close to where they were removed or **bagged and stored** in a suitably **protected area** (area to be excluded from construction activities) for use in rehabilitation and landscaping activities. If stored, these plants should be used for the **rehabilitation** of disturbed areas / areas cleared of alien vegetation, as to be directed by the **ECO**.

The botanical specialist has confirmed that no TOPS species are present on site.

5.4 ALIEN INVASIVE MANAGEMENT PLAN

Due to the aridity and current use of the site, there is currently very little impact from Alien Vegetation. The following management interventions should be incorporated:

- **Remove any and all alien vegetation** along the chosen powerline alignment and maintenance track route for the **entire width of the** of the transmission line (to avoid the risk of wild-fires damaging the powerline). It is critical that this alien plant biomass should not be burned or stored on-site. Instead, this biomass should be cut and chipped, and the chipped material lain down within the powerline servitude and access tracks. Under no circumstances may this chipped material be dumped or moved outside of the powerline servitude. As this material will contain seeds and there is already a seed bank present, a **strict monitoring and follow-up programme** must be implemented to ensure that any regrowth is controlled.
- Watercourses and plains washes shall be kept clear of felled trees, vegetation cuttings and debris.
- **Areas disturbed** by construction should be **monitored** (for at least three years post-construction) for invasion by woody alien invasive seedlings. These would be stimulated to grow by the disturbance and should be removed when found.

The biomass of woody alien vegetation removed during the abovementioned alien plant removal may not be left as is on-site under the powerline, or on adjacent land, as this will poses a great fire risk. Rather woody alien vegetation should be cut up and removed from site (to a municipal dump / composting facility or alternative site where the wood can be used without posing a fire risk to property or infrastructure) and/or chipped (for possible use to maintain access tracks). Under no circumstances may this chipped material be dumped or moved outside of the powerline servitude. As this material will contain seeds and there is already a seed bank present, a **strict monitoring and follow-up programme** must be implemented to ensure that any regrowth is controlled. **Under no circumstances should bulk biomass be burned on-site**.

5.5 FIRE MANAGEMENT AND PROTECTION

The **type** and **state** of the vegetation found along the powerline route poses a **moderate fire risk** associated with uncontrolled **wildfires**.

The following points should be considered with regards to fire protection RE Capital – Grid Connection and adjacent natural and agricultural areas:

- A key component of the abovementioned alien invasive plant removal programme should be the total **removal** of all **invasive alien vegetation material** within the servitude of the electrical line infrastructure, to decrease the fire risk associated with the accumulation of biomass.;

- Smoking should preferably not be allowed while on site. Construction staff and future maintenance technical staff 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 (extinguished completely and placed in a sealed container). 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 and **fire extinguisher**.
- 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 at each of the Switching Station sites);
- Contractors must ensure that basic **firefighting equipment** is available on site at all times as per the specifications defined by the health and safety regulations;
- **No fires should be allowed** inside or outside the site-camp; 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 management and maintenance meetings.

5.6 RE-VEGETATION / REHABILITATION PLAN

The potential rehabilitation of disturbed areas where alien vegetation has been removed can stimulated and fast-tracked by the brush-packing and/ mulching with locally occurring indigenous vegetation and the physical planting of locally occurring indigenous plants.

Should plants of conservation value be rescued during the pre-construction site assessment, these can also be planted within these disturbed areas. All the prerequisite permits must be in place before any legal protected plants or animals are disturbed / moved.

5.7 EROSION CONTROL & STORMWATER MANAGEMENT

The contractor is responsible for implementation of the stormwater management plan, required to prevent water erosion and wind-blow-outs from occurring as a direct result of any pre-construction and construction activities. It will be the responsibility of the Holder of the Authorisation to ensure permanent erosion control measures are in place and maintained in areas prone to erosion along the powerline alignment (for e.g. along access tracks on gradients etc.).

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 vegetation-clearing and earthworks / construction periods. During construction, the Contractor shall protect all areas susceptible to erosion by installing necessary temporary and permanent erosion control measures (for water and wind) as soon as possible and by taking any other measures necessary to prevent stormwater from concentrating and scouring slopes, embankments etc. All the prerequisite permits must be in place before any legal protected plants or animals are disturbed / moved.

Any **erosion channels** found to exist long the powerline alignment 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 where necessary) 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.

5.8 TOPSOIL HANDLING

In terms of best practice and for rehabilitation purposes, it is essential that any topsoil stripped or removed for the leveling and stabilization of the sub-station site and pylon foundations, must be stockpiled for further use during rehabilitation activities post construction. A site for the temporary stockpile of topsoil must be allocated in close proximity to each of switching stations by the ECO. 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 of the switching stations (max. 100m x 150m) and pylons (3m x 3m) should be stripped and **stockpiled**;
- The topsoil stockpile sites must be approved by the **ECO** and may not be within the 32m of any slope of drainage line;
- The topsoil stockpile site should preferably be located within already disturbed areas (old tracks, fire breaks, quarry sites etc.) and may not be stockpiled within any of the remaining natural / sensitive 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 on completion of construction and suitably shaped to minimise erosion and visual intrusion.

5.9 AVIFAUNAL REQUIREMENTS

All constructed powerlines should be **marked with Bird Flight Diverters on the earth wire of the line, five metres apart, alternating black and white**.

5.10 NOISE CONTROL

It is recommended that noise generation be kept to a minimum and that construction activities be confined to **daylight hours** on week days (06:00 to 18:00) and until 13:00 on Saturdays (as negotiated with affected landowner). Should construction activities need to extend beyond these daylight hours or over weekends, consent should first be received from the affected landowner or local community representatives living on the affected land, prior to such works commencing.

Apart from confining noise to the daylight 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 (30km per hour);
- **Avoid unnecessary running of heavy machinery -** Switch off machinery immediately when not in use;
- 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); 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.

5.11 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. There are unlikely to be any **operational** waste management requirements necessary.

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 (NEM:WA). 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. **Disposal Certificates** confirming disposal of waste must be obtained and filed by the Contractor for inclusion in the Audit Reports.

5.11.1 Solid Waste

The **Contractor** shall ensure that the site (along the entire powerline alignment) and 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 behavior 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**.

5.11.2 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 infill on site.

5.11.3 Scrap Metal

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

5.11.4 Hazardous Waste

Any potentially **hazardous** waste (including, 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. Used **oil** and **grease** must be removed from site to an approved used oil **recycling company**.

Under **NO** circumstances may **any oil or paint** products be spoiled on the site.

The maintenance of vehicles should take place off site. Should emergency repairs be necessary, these may only be undertaken with the use of a drip tray.

5.12 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 with 50m of the watercourses or plains washes;
- 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 emptied before weekends, public holidays and any extended period when the construction site to closed. All toilets must be removed from site on completion of the contract period;
- "Sani bins" should be provided for women and water for washing hands; and,
- Should the construction period be interrupted by a builders break, the toilets should be emptied prior to the break.

5.13 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 access tracks, pylon positions and sub-station;
- 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);
- All areas **outside** this demarcated area are considered as "**no-go**" areas for any construction;
- A **32m buffer on all watercourses,** must be maintained as no-go areas, and
- Construction staff must be briefed as part of the **environmental induction** on the requirements regarding the no-go areas.

5.14 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 EMPr. 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 **EMPr**;

- 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 **EMPr** 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 EMPr.

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 DEA.

5.15 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.

Wherever possible the use of **redi-mix concrete should be preferred** over concrete batching. Should redi-mix be used measures must be put in place to avoid any spillage during transport and dispensing. Should spillage take place, all spillage concrete must be immediately picked up for re-use or disposal along with the general waste disposal system. Under no circumstances may waste / spilled concrete for spoiled anywhere on site.

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 areas that are 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 **50m** of the on-site stream / dam / wetland area 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 where stormwater run-off is concentrated.

A **Method Statement** should be compiled prescribing all standard measures for mixing, using, cleaning implements and disposing of excess / waste concrete & waste water. Measures stipulated in the EMPr, whether concrete is mixing on batching plates or imported as redi-mix, must be strictly adhered to.

5.16 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 and strictly adhered to:

- 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. **Disposal Certificates** confirming disposal of waste must be obtained and filed by the Contractor for inclusion in the Audit Reports.

5.17 DUST MANAGEMENT

Every effort to **minimize dust pollution** on the site must be undertaken, especially considering the cumulative impact of dust along with the three PV facilities. Construction vehicles must adhere to **speed limits** (30km per hour) on all haul roads (public roads and/ private farm roads used to transport materials to and from construction sites). 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 powerline construction sites.

5.18 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** (area close watercourses or plains washes) 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 in close proximity to the construction areas, on disturbed land, further than 50m from any watercourse or plains washes, as approved by the ECO and the affected landowner. Should any natural vegetation need to be cleared for the site camp, this must be approved by the ECO before-hand. 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.
- 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). All toilet facilities must be emptied before weekends, public holidays and any extended period when the construction site is to be closed. All toilets must be removed from site on completion of the contract period.
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5.19 ACCESS / TRAFFIC MANAGEMENT DURING CONSTRUCTION

In order to facilitate vehicular access to the RE Capital 2– Grid Connection construction site/s, it is recommended that the existing access tracks be used to access the powerline, fence lines and firebreaks (in consultation with the relevant landowners and in compliance with the Environmental Authorisation).

The **management** of **construction traffic** is vital to ensuring the **safety** of the existing 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 minimized and avoided as far as possible.
- **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** of the area and the Contractor 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** as far as reasonably possible.

Adequate and clearly visible road **signage** should be implemented on the site, at the new access point, throughout the duration of the construction period according to the specifications of the South African Road Traffic Signs Manual (**SARTSM**).

5.20 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, with prior approval from the affected landowner and adjacent community, 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.

5.21 THEFT AND OTHER CRIME

An **increase** in **crime** during the **construction phase** is always an area of concern, particularly in instances where construction takes place in proximity to farm homesteads and communities. **Theft** and other **crime** associated with construction sites is not only a **concern** for surrounding residents, but also for 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 i**nternal** 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 DEA. 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.

6 SOCIAL REQUIREMENTS

6.1 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.

Staff Type	Local to the Zeerust Area		NW Province (excluding the Zeerust Area)		Outside The North West Programme	
	Number	Percentage	Number	Percentage	Number	Percentage
Semi-skilled						
Operators						
Artisans						
Junior Management						
Senior Management						
Professionals						

7 HERITAGE REQUIREMENTS

The following measures, in terms of the existing heritage, archaeological and palaeontological resources in the area, must be implemented:

- If archaeological or palaeontological materials are exposed during vegetation clearing and/or earth moving activities, these include (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 then ECPHRA should be immediately informed and the materials must be dealt with in accordance with the National Heritage Resources Act (No. 25 of 1999) and at the expense of the developer.
- In the event of exposing human remains older than 60 years during construction, the matter will fall into the domain of South African Heritage Resources Agency (SAHRA) (Mrs. Collette Scheermeyer) and will require a professional archaeologist to undertake mitigation if needed. Such work will also be at the cost of the developer.

8 METHOD STATEMENTS

Method statements are **written submissions** by the **Contractor to** the **Engineer** and **ECO** in response to the **requirements** of this **EMPr** 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 **EMPr** specification and motivation if non-compliant.

8.1 METHOD STATEMENTS REQUIRED:

Based on the specifications in this EMPr, 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 and access track clearing**;
- **Hazardous substances** declaration of use;
- **Cement** and **concrete batching** - all standard measures for mixing, using, cleaning implements and disposing of excess concrete and waste water, must be including in this statement;
- 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.

9 OPERATIONAL REQUIREMENTS

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

9.1 ENVIRONMENTAL MAINTENANCE MANAGEMENT PROGRAMME (EMMP)

The Holder of the Environmental Authorisation will be responsible for the operational management and maintenance of access tracks and servitudes, the powerline, and the switching stations – the following must be considered:

- The **Holder of the Environmental Authorisation** must ensure that the **conditions** of the **Environmental Authorisation** are adhered to;
- **Energy efficiency** measures to reduce energy consumption as described in this EMPr are implemented on switching stations (if applicable).
- **Alien plant removal**, which includes the follow-up and systemic eradication and prevention of further encroachment of alien invasive plant species within the powerline and access track servitudes, as specified in of this **EMPr,** must be continued and monitored into the future. A **strict monitoring and follow-up programme** must be implemented to ensure that any regrowth is controlled. **Under no circumstances should bulk biomass be burned on-site.**
- As mentioned above, the **re-growth of vegetation** in areas where alien invasive vegetation has been removed must be encouraged.
- Regular monitoring of the powerline access tracks and there immediate surrounds 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.

9.2 WASTE MANAGEMENT DURING OPERATION

9.2.1 Use / Disposal of Alien Invasive Plant Biomass

In accordance with the recommended long-term alien invasive plant removal programme for the electrical line servitude, alien plant biomass may **not** be **disposed** of on adjacent farm land or natural veld (as this poses a fire risk and further contamination of alien plant seed). Unwanted germination of seed in natural areas and farmland and accumulation of fire-prone biomass is to be prevented at all costs. It is thus recommended that all plant biomass removed during maintenance activities (whether trimmed / felled tall trees or alien plant seedlings / saplings) must either be cut up and removed from site (to a registered municipal garden refuse / composting site or similar) and/or chipped to maintain access tracks etc. Under no circumstances may this chipped material be dumped or moved outside of the powerline servitude. As this material will contain seeds and there is already a seed bank present, a **strict monitoring and follow-up programme** must be implemented to ensure that any regrowth is controlled. **Under no circumstances should bulk biomass (natural or alien vegetation) be burned on-site.**

10 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.

11 RESPONSIBILITIES

Details of the **organizational structure** are presented in **Figure 2.** The structure illustrates the reporting procedures for stakeholders in the implementation of this EMPr.

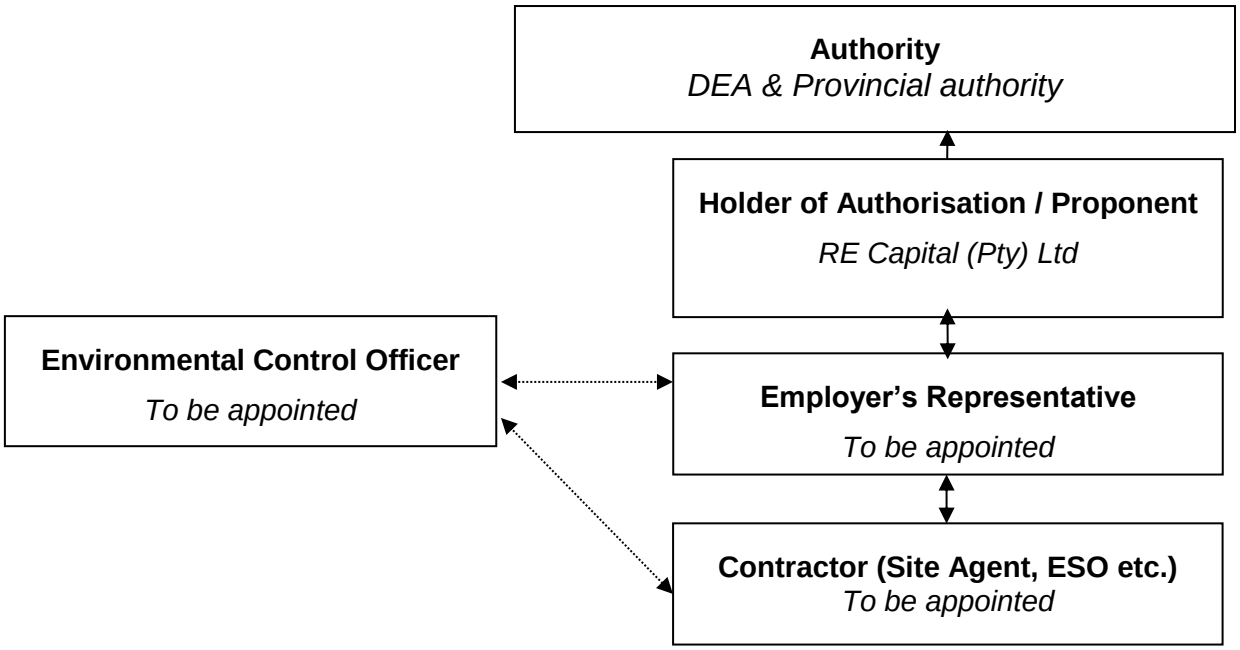

Figure 2: EMPr implementation organizational structure during construction.

The ECO must report to the Employer's Representative (generally the Project Engineer), whose has the responsibility to either instruct the Contractor and/or inform the Holder of the Authorisation on matters related to the implementation of this EMPr. It is the responsibility of the Holder of the Authorisation to inform or gain input from the relevant Authority regarding such matters.

12 IMPLEMENTATION SCHEDULE

This EMPr is applicable to all construction activities associated with the construction of the RE Capital 2 – Grid Connection. The following summary of the implementation of the key environmental management requirements must be adhered to.

TASK	RESPONSIBILITY	TIMEFRAME
Appointment of Contractors	Contracting Engineer / Client	Prior to Construction
Demarcation of No Go Areas	ECO & Main Contractor	Prior to Construction commencing and duration
Establishment of Site Camp	Contractors	Prior to Construction
Environmental Awareness and Induction	ECO	Prior to Construction commencing and duration
Health and Safety Protocol	Contractor / Health and Safety Officer	Duration of contract
Attendance of Site Meetings	Project Proponent / Contracting Engineer / Contractor / ECO / Health and Safety Officer / ESO	Duration of contract
Ablution Facilities	Contractor	Duration of contract
Waste Management	Contractor	Duration of contract

Plant Rescue	ECO	Duration of contract
Topsoil Stripping	Contractor	Duration of contract
Cement Batching	Contractor	Duration of contract
Fuel Storage	Contractor	Duration of contract
Noise Control	Contractor	Duration of contract
Dust Management	Contractor	Duration of contract
Compliance with Noise Regulations	Contractor	Duration of contract
Erosion Control	Contractor	Duration of contract
Environmental Control / Audit Reports	ECO	Monthly for duration of contract
Non-compliance	ECO / Relevant Authority	Duration of contract
Compliance with all environmental management requirements	All role players	Duration of contract

13 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 to report matters of non-compliance to the Employer's Representative (e.g. Project Engineer), who in turn is tasked with reporting such matters to the Holder of the Authorisation. It is the responsibility of the Holder of the Authorisation (the Applicant), and not the ECO, to report such matters of non-compliance to the relevant Authority.

14 MONITORING

Monitoring of the construction progress must be done by means of **photographic documentation** by the ECO and ESO. 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.

15 IMPLEMENTATION SCHEDULE

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

16 REFERENCES

Brownlie S (2005). *Guideline for involving biodiversity specialists in EIA processes*. Department Environmental Affairs & Development Planning.

DWA (2001). *Generic public participation guideline*. Department of Water Affairs and Forestry.

DEA (2010). *Public Participation*, Integrated Environmental Management Guideline Series 7, Department of Environmental Affairs, Pretoria.

DEAT (2002). Integrated Environmental Management Information Series 3: *Stakeholder Engagement*. Department of Environmental Affairs and Tourism, Pretoria.

DEAT (2004). *Criteria for determining alternatives in EIAs*, Integrated Environmental Management, Information Series 11, Department of Environmental Affairs & Tourism, Pretoria.

DEAT (2004). *Environmental management Plans*, Integrated Environmental management, Information Series 12, Department Environmental Affairs & Tourism

DEAT (2005). *Assessment of Impacts and Alternatives*, Integrated Environmental Management Guideline Series, Department of Environmental Affairs & Tourism, Pretoria.

DEAT (2005). Guideline 4: *Public Participation*, in terms of the EIA Regulations 2005, Integrated Environmental Management Guideline Series, Department of Environmental Affairs and Tourism, Pretoria.

DEADP (2003). Waste Minimisation *Guideline for Environmental Impact Assessment reviews.* NEMA EIA Regulations Guideline & Information Series, Department Environmental Affairs & Development Planning.

DEADP (2005). *Guideline for the review of specialist input in the EIA process*. NEMA EIA Regulations Guideline & Information Document Series, Department of Environmental Affairs & Development Planning.

DEADP (2005). *Guideline for involving biodiversity specialists in the EIA process*. NEMA EIA Regulations Guideline & Information Document Series, Department of Environmental Affairs & Development Planning.

DEADP (2005). *Guideline for environmental management plans*. NEMA EIA Regulations Guideline & Information Document Series, Department of Environmental Affairs & Development Planning.

DEADP (2005). *Provincial urban edge guideline*. Department Environmental Affairs & Development Planning.

DEAT (2006). *EIA Regulations* in terms of the National Environmental Management Act (Act No 107 of 1998) (Government Notice No R 385, R 386 and R 387 in Government Gazette No 28753 of 21 April 2006).

DEADP (2006). *Guideline on the Interpretation of the Listed Activities.* NEMA EIA Regulations Guidelines & Information Document Series, Department of Environmental Affairs & Development Planning.

DEADP (2007 & 2009). *Guide on Alternatives,* NEMA EIA Regulations Guidelines & Information Document Series, Department of Environmental Affairs & Development Planning.

DEADP (2007 & 2009). *Guideline on Appeals,* NEMA EIA Regulations Guidelines & Information Document Series, Department of Environmental Affairs & Development Planning.

DEADP (2007 & 2009). *Guideline on Exemption Applications.* NEMA EIA Regulations Guidelines & Information Document Series, Department of Environmental Affairs & Development Planning.

DEADP (2010 & Oct 2011). *Guideline on Generic Terms of Reference for EAPs and Project Schedules,* NEMA EIA Regulations Guideline and Information Document Series, Department Environmental Affairs & Development Planning.

DEADP (2010 & Oct.2011). *Guideline on Need & Desirability,* NEMA EIA Regulations Guideline and Information Document Series, Department Environmental Affairs & Development Planning.

DEADP (2010 & Oct 2011). *Guideline on Alternatives*, NEMA EIA Regulations Guideline and Information Document Series, Department Environmental Affairs & Development Planning.

DEADP (2010 & Oct 2011). *Guideline on Transitional Arrangements,* NEMA EIA Regulations Guideline and Information Document Series, Department Environmental Affairs & Development Planning.

DEADP (2010 & Oct 2011). *Guideline on Exemption Applications*. NEMA EIA Regulations Guideline and Information Document Series, Department Environmental Affairs & Development Planning.

DEADP (2010 & Oct 2011). *Guideline on Appeals*. NEMA EIA Regulations Guideline and Information Document Series, Department Environmental Affairs & Development Planning.

DEADP (2010 & Oct 2011). *Guideline on Public Participation*. NEMA EIA Regulations Guideline and Information Document Series, Department Environmental Affairs & Development Planning.

ESKOM Environmental Procedure for Clearance and Maintenance within Overhead Powerline Servitudes (May 2010). Document type: EPC. Unique Identifier: 32-247.

Keatimilwe K & Ashton PJ (2005). *Guideline for the review of specialist input in EIA processes.* Department Environmental Affairs & Development Planning.

Lochner P (2005). *Guideline for Environmental Management Plans*. Department Environmental Affairs & Development Planning.

Mucina, L. & Rutherford, M.C. (eds) 2006. *The Vegetation of South Africa, Lesotho and Swaziland. Strelitzia 19.* South African National Biodiversity Institute, Pretoria.

Munster F (2005). *Guideline for determining the scope of specialist involvement in EIA processes.* Department Environmental Affairs & Development Planning.

Oberholzer B (2005). *Guideline for involving visual & aesthetic specialists*. Department Environmental Affairs & Development Planning.

SANBI Biodiversity GIS (2007). South African National Biodiversity Institute, Cape Town, South Africa.

Winter S & Beaumann N (2005). *Guideline for involving heritage specialists in EIA processes.* Department Environmental Affairs & Development Planning.