PROPOSED PAARDEVLEI SOLAR PV & BATTERY ENERGY STORAGE SYSTEM PROJECT

ENVIRONMENTAL MANAGEMENT PROGRAMME

DEA&DP REF: 16/3/3/2/A3/54/2018/24

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Prepared for:

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SYNOPSIS

Construction and Operational EMPr for the proposed Paardevlei Solar PV & Battery Energy Storage System (BESS) Project, Somerset West, Cape Town

KEY WORDS:

NEMA, EMPr, CEMPr, OEMPr, DBAR, DEA&DP

QUALITY VERIFICATION

This report has been prepared under the controls established by a quality management system that meets the requirements of ISO 9001: 2015 which has been independently certified by DEKRA Certification.

Verification	Capacity	Name	Signature	Date
By Author	Senior Environmental Scientist	Ryan Emslie Jonas		29/11/2024
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DEFINITIONS

For the purposes of this EMPr the following definitions shall apply:

Alien Vegetation	Alien vegetation is defined as undesirable plant growth which includes, but is not limited to, all declared category 1 and 2 listed invader species as set out in the Conservation of Agricultural Resources Act (CARA) Regulations. Other vegetation deemed to be alien shall be those plant species that show the potential to occupy in number, any area within the defined construction area.
Applicant	The City of Cape Town or its duly authorised and appointed representative, with rights to undertake the development on the Site.
Construction Activity	A construction activity is any action taken by the Contractor, his subcontractors, suppliers or personnel during the construction process.
Contractor	The principal person or company, including all subcontractors, undertaking the construction of the development.
Contractor's Camp	Means the area designated for all temporary site offices, storage areas, plant parking areas, staff welfare facilities, etc.
Environment	Means the surroundings within which humans exist and that are made up of: i. The land, water and atmosphere of the earth; ii. Micro-organisms, plant and animal life; iii. Any part or combination of (i) and (ii) and the interrelationships among and between them; and iv. iv. The physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well being.
Environmental Control Officer	An independent appointment to objectively monitor the implementation of relevant environmental legislation and conditions of the CEMPr for the project. The ECO should be on site prior to any site establishment and must endeavour to form an integral part of the project team.
Environmental Management Programme	A detailed programme of action prepared to ensure that recommendations for enhancing potential positive impacts and avoiding or limiting potential negative environmental impacts/risks are implemented during the life-cycle of a project.
Hazardous	Contains an element of risk. Dangerous or toxic to life.
Hazardous Substance	Means any toxic, harmful, corrosive, irritant or asphyxiant substance, or a mixture of such substances which can cause an impact to the environment.
Maintenance	The complete upkeep, support and protection of areas/regions/sites.
Method Statement	Is a written submission by the Contractor to the ECO an RE, setting out the plant, materials, labour and method the Contractor proposes to use to carry

	out an activity in such detail that the ECO can assess whether the Contractor's proposal is in accordance with the CEMPr.
Mitigation	The implementation of practical measures to reduce adverse impacts or enhance beneficial impacts of an action.
Pollution	The residue of human activity that adversely affects the next user of some environmental resource.
Rehabilitation	To re-establish or restore to a healthy sustainable capacity or state.
Resident Engineer	The person(s) who represents the Engineers and is/are responsible for the technical and contractual implementation of the works to be undertaken.
Waste	Means any substance, whether or not that substance can be reduced, re-used, recycled and recovered— a) that is surplus, unwanted, rejected, discarded, abandoned or disposed of b) which the generator has no further use of for the purposes of production; c) that must be treated or disposed of; or d) that is identified as a waste by the Minister by notice in the Gazette.
Watercourse	Means (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.
Wetland	Land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil.
Working Areas	Means any area within boundaries of the Site where construction is taking place.

LIST OF ABBREVIATIONS

Abbreviation	Definition
CCT	City of Cape Town
DEA&DP	Department of Environmental Affairs and Development Planning
DEO	Designated Environmental Officer
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EMPr	Environmental Management Programme
IAIAsa	International Association of Impact Assessment South Africa
I&APs	Interested and Affected Parties
MSDS	Material Safety Data Sheets
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended
NHRA	National Heritage Resources Act, 1999 (Act 25 of 1999)
OHSA	Occupational Health and Safety Act
OEMPr	Operational Environmental Management Programme.
Pr.Sci.Nat.	Professional Natural Scientist
PV	Photovoltaic
RE	Resident Engineer

TABLE OF CONTENTS

TABLES

FIGURES

1 INTRODUCTION

1.1 Project Background

The City of Cape Town is currently proposing the development of a Solar Photovoltaic (PV) Facility & Battery Energy Storage System (BESS) on City-owned vacant land within Somerset West, known as Paardevlei.

The preparation of the Paardevlei Solar PV Facility & BESS project falls under the framework of support where, C40 Cities Finance Facility (CFF), engages primary and secondary cities worldwide to mobilise financial resources for transformative actions, which significantly reduce their Green House Gas emissions and build climate resilience.

The project will assist with the ongoing electricity crisis present in South Africa, and in Cape Town in particular. Load-shedding, due to lack of generation capacity, is a daily occurrence in South Africa and has a negative impact on households and businesses. This is the main factor contributing to the electricity crisis is supply not being able to meet demand which impacts the everyday life of South Africans. The occurrence has forced many businesses to function at reduced capacity, leading to a decline in productivity and impacting South Africa's economy.

1.2 Site Location

The proposed Paardevlei Solar PV Facility & BESS project will be a 54-69 MW facility on City owned land portions (with a total extent of **72 ha**) connected directly to an existing 132 kV switching station located near to the site (refer to **Figure 1**) and owned to the City of Cape Town. Construction is planned to start in the 1st quarter of 2026.

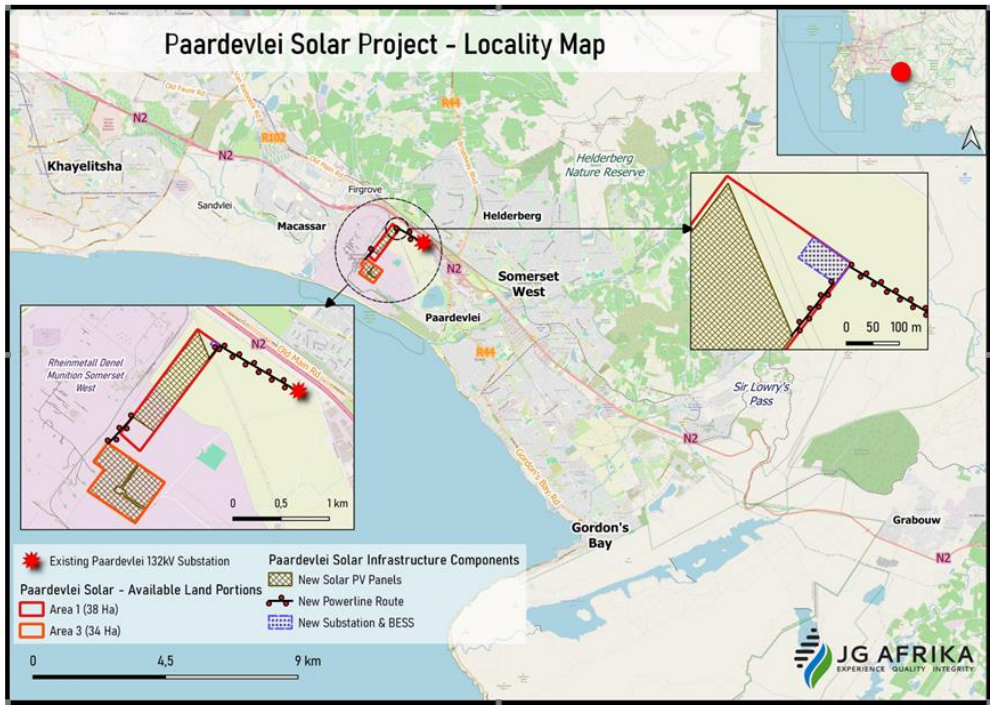

Figure 1: Locality map for the Paardevlei Solar PV & BESS project

The above Figure 1 refers:

- **The preferred land portions to be developed by the Project Applicant is Area 1 and Area 3.**

The properties affected by the proposed solar PV site development plan are presented in **Table 1**

Table 1: Affected properties description

Surveyor General 21G code	Property Description	Registered Owner
C[redacted]	Portion 11 HELDERBERG SLEEPER PLANTATION 787	CITY OF CAPE TOWN
C[redacted]	Portion 10 HELDERBERG SLEEPER PLANTATION 787	CITY OF CAPE TOWN
C[redacted]	Portion 0 (REMAINING EXTENT) of FARM 792	CITY OF CAPE TOWN

1.3 Proposed PV layout alternatives

The following examples of PV layout alternatives are proposed (based on the studied PV configurations):

1) **PV layout 1**: Fixed tilt panels (refer to **Figure 2**).

*Figure 2: Paardevlei Solar PV Facility & BESS project - PV Layout 1 (**Fixed tilt panels**)*

2) **PV layout 2:** Single Axis tracker panels (refer to **Figure 3**).

*Figure 3: Paardevlei Solar PV Facility & BESS project - PV Layout 2 (**Single Axis tracker panels**)*

PV layout 3: East West Sheds (refer to **Figure 4**).

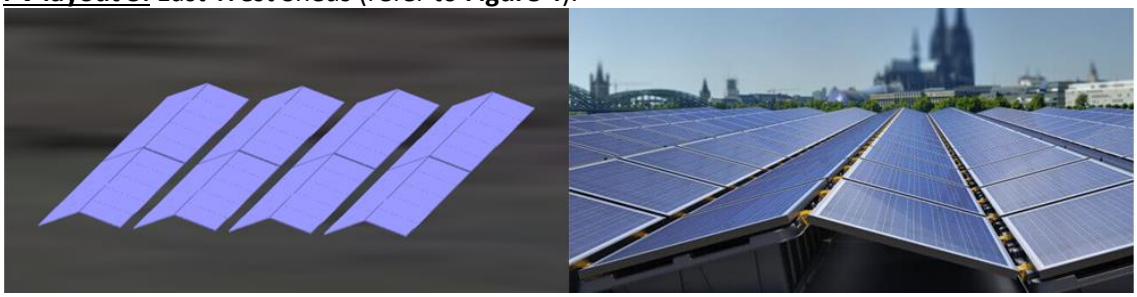

*Figure 4: Paardevlei Solar PV Facility & BESS project - PV Layout 3 (**East West Sheds panels**)*

The Project Applicant, namely City of Cape Town (Sustainable Energy Markets) has indicated that the type of PV Layouts (as mentioned in the section above) can only be determined and confirmed during the detailed design phase and not during the current (EIA) feasibility phase of the project.

Associated Infrastructure

The following additional infrastructure is proposed in support of the proposed Paardevlei Solar PV Facility & BESS project.

- **Access roads**: It is proposed to use existing roads to access the PV facility and to add internal roads to access the PV Arrays. However, the construction new or upgrade of existing roads may be required.
- **Underground cabling (between and from the PV modules)** to tie into inverters and then to switchgears and transformers as well as a connection with the proposed new PV plant substation & BESS.
- **Overhead powerline or underground cables** to connect from the new PV substation & BESS to the existing Paardevlei 132 kV substation.
- **Operational & Maintenance building** (to be located at the new PV substation & BESS location).
- **MV / HV transformers / Inverter stations**.

2 PURPOSE OF THE ENVIRONMENTAL MANAGEMENT PROGRAMME

The compilation of this Construction and Operational Environmental Management Programme (EMPr) forms part of the EIA Process and will be submitted to the competent authority, namely the Department of Environmental Affairs and Development Planning (DEA&DP) with the EIA report for environmental authorisation. The EMPr must therefore be updated in accordance with any additional conditions prescribed in the Environmental Authorisation (EA). **The EMPr and EA must be kept on site at all times.**

This Environmental Management Programme (EMPr) describes, amongst others, mitigation measures and identifies the specific people/entities that will be responsible for implementation of the identified mitigation measures in order to ensure that impacts on the environment are minimised during the planning, construction and operational phases for the proposed Paardevlei Solar PV Facility.

This EMPr has been prepared in compliance with **Appendix 4 of the EIA Regulations, 2014** (as amended).

The details and role of the Environmental Assessment Practitioners (EAP) involved in the preparation of this EMPr is provided in **Table 2** below. A Curriculum Vitae (CV) is attached as **Annexure A.**

Table 2: Details of the EAP

EAP	Ryan Emslie Jonas
EMAIL ADDRESS	[redacted]
QUALIFICATIONS	M.Sc (Environmental Science), BSc (Natural Sciences)
PROFESSSIONAL REGISTRATIONS AND AFFILIATIONS	**SACNASP** - Professional Natural Scientist (Environmental Science) (Registration no: 400159/15). **EAPASA** - Environmental Assessment Practitioner Association (Membership number: 2019/1674). **IAIA** - International Association of Impact Assessment (Membership number: 5065).
EXPERTISE	Ryan Emslie Jonas is a Senior Environmental Scientist and has acquired 17 years consulting experience in managing and executing various application processes for a diverse range of large infrastructure developments, mining and renewable energy (solar and wind energy facilities) projects in order to obtain environmental authorisations, licenses for waste management, water uses, air emissions release and compiling and implementing environmental management programmes.

	Ryan has also fulfilled numerous environmental compliance monitoring functions for infrastructure-related developments (e.g. roads, pipelines, airport developments, housing and mixed-used projects), renewable energy and various mining and industrial sites throughout Southern Africa.

3 SUMMARY OF SPECIALIST FINDINGS AND MITIGATIONS

3.1 Visual Assessment

Nuleaf Planning and Environmental (Pty) Ltd (Nuleaf) was appointed to conduct the Visual Impact Assessment for the proposed Paardevlei Solar PV and BESS project.

3.1.1 Study Findings

The result of the viewshed analyses for the proposed Paardevlei Solar PV & BESS is shown on **Figure 5**. The visibility analyses (or viewsheds) for the proposed development was calculated from each structure area as outlined in the layout.

Figure 5: Potential visual exposure (viewshed analysis) of the proposed Paardevlei Solar PV & BESS

The following is an overview of the findings of the potential visual impact of Paardevlei Solar PV & BESS, based on the layout illustrated on the Map provided:

0 - 1km - Short distance

It is expected that the facility would be highly visible within this zone with small pockets of visually screened areas lying to the southern portion of this zone. No residential suburbs and very limited farm dwellings are expected to be located within this zone, as such the sensitive receptors likely to be visually exposed to the PV facility infrastructure are limited to a small portion of observers travelling along the N2 and R102, visitors to the outskirts of the western portions of Paardevlei, as well as a portion of the Helderberg MPA.

1 - 3km - Medium distance

Visual exposure within this zone becomes slightly more scattered with visually screened areas lying to the far portions of the north, east and west of this zone. Visual exposure is concentrated to the inner portions of this zone, on the Somerset West suburbs of Lynn's View, Heldervue, Die Wingerd and The Links of Blue Downs to the north, scattered along the suburb of Macassar to the west, as well as the commercial and housing estates located to the east of the Paardevlei. Numerous residences/ farm dwellings are scattered throughout this zone including Eendrag, Waterkloof, Skoongesig and Rusthof to name a few. Portions of the N2, R102, R44 and other secondary roads fall within the visual exposure. Observers travelling along these roads are expected to be exposed to the PV facility infrastructure. Additionally, scattered areas of exposure are expected in and around Paardevlei and within the Lourens River Protected Natural Environment.

3 - 6km- Medium to long distance

Within a 3 – 6km radius, the visual exposure is greatly reduced and interrupted due to the undulating nature of the topography. Large visually screened areas are found to the north, east, and west. Visual exposure is predominately concentrated to the north-west and the higher lying areas towards the Helderberg in the north-east, with scattered areas of exposure to the south-east. Numerous residential suburbs and farm dwellings are scattered throughout this zone inclusive of Stand, portions of Somerset West, and Ridgemoore. Portions of the N2, the R102 and R44 may be exposed to the PV Facility. It should also be noted that the southernmost portion of the Hottentots Holland Nature Reserve falls inside the visually exposed areas to the north-east.

> 6km – Long distance

At distances exceeding 6km the intensity of visual exposure is expected to be very low and highly unlikely due to the distance between the object (development) and the observer.

In general terms it is envisaged that the structures, where visible from shorter distances (e.g. less than 1km and potentially up to 3km), and where sensitive visual receptors may find themselves within this zone, may constitute a high visual prominence, potentially resulting in a visual impact. This may include residents of residential suburbs and farm dwellings mentioned above, as well as observers travelling along roads.

3.1.2 Mitigation measures

Construction Phase

- Retain and maintain natural vegetation and trees in all areas outside of the development footprint.
- Consult adjacent communities in order to inform them of the development and to identify any (valid) visual impact concerns.

Operational Phase

- Maintain the general appearance of the solar facility as a whole.
- Retain / re-establish and maintain natural vegetation and trees immediately adjacent to the solar development footprint.
- Investigate the potential to screen affected receptor sites with planted vegetation cover.

3.2 Ecological Assessment

MORA Ecological Services (Pty) Ltd. (MORA) were appointed to conduct an Ecological Impact Assessment for the proposed Paardevlei Solar PV and BESS project.

3.2.1 Study Findings

Two broad vegetation units were identified during the field survey. Both are based on floristic differences of different topographical positions and natural habitat types, namely:

- Vegetation Unit 1: Wetland vegetation (plant community) – Refer to **Figure 6.**

Figure 6: Vegetation Unit 1: Wetland vegetation (plant community)

Vegetation Unit 1 is internally draining, therefore, creating a pond that influences the development of wetland vegetation.

- Vegetation Unit 2: Natural grassland vegetation (Fynbos) - Refer to **Figure 7.**

Figure 7: Vegetation Unit 2: Natural grassland vegetation (Fynbos)

The natural grassland vegetation occupies the broader area of the development site and is on a lower slope, observed to be grazing land for cattle.

Invasive Alien Plants

The development layout footprint is dominated by woody invasive alien plants, i.e., the *Eucalyptus* sp. and the Acacia saligna. Therefore, it should be well ensured that invasive alien plants are controlled prior to reaching the construction phase of the development. This will assist in reducing the propagation of these problematic species across the footprint area.

From the survey conducted, the majority of the habitats within the project footprint have been highly transformed. However, there are aquatic microhabitats that have resulted from this land transformation.

Sensitive areas

The area delineated as a polygon in yellow (4.31 Ha) within the proposed development footprint is, from an ecological perspective, a No-go area (refer to **Figure 8**). This is a drainage line that supports aquatic life and is critical to plant root health.

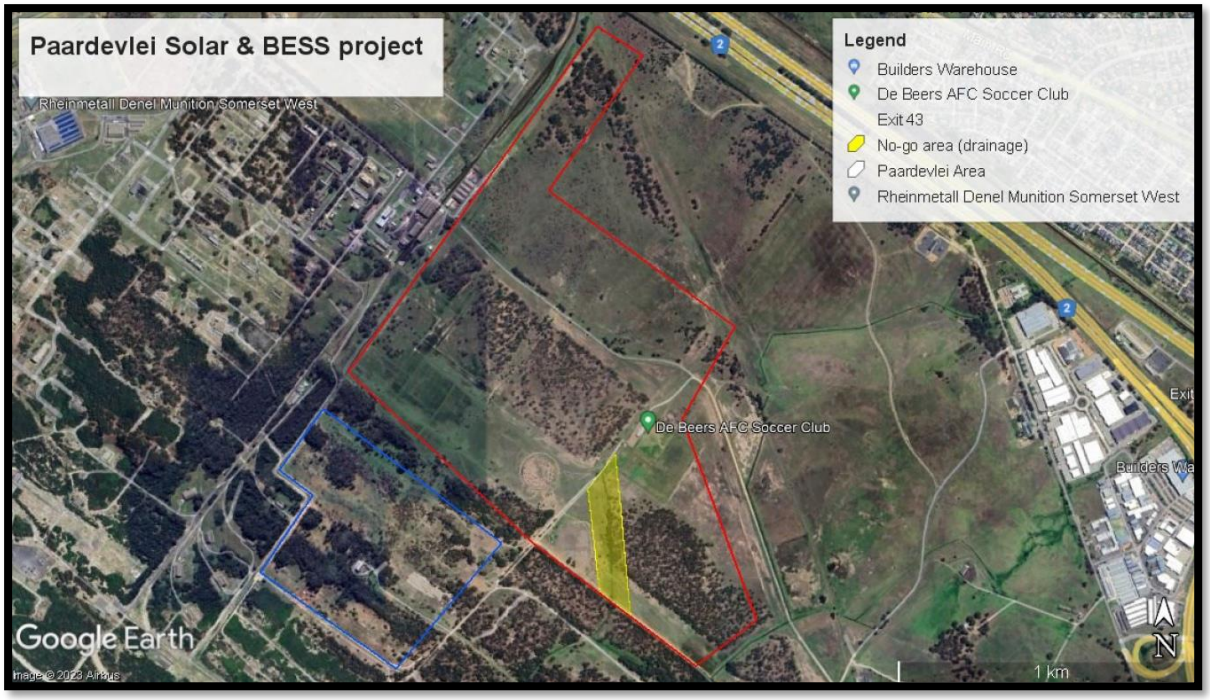

Figure 8: Delineation of no-go area as per Ecological specialist recommendation

3.2.1 Mitigation measures

Construction Phase

- Minimise the development footprint and reserve indigenous vegetation wherever possible.
- All vegetation not required to be removed should be protected against damage.
- **Sensitive areas such as wetlands and drainage lines must be avoided where possible.**
- Existing roads must be used where possible during construction of the project.
- The project should be executed in a short timeframe, if possible, and pollution control should be implemented.
- Rehabilitate area with indigenous flora.
- Have a biodiversity protocol and rehabilitation plan that will be implemented following the construction phase.
- Invasive plant material should be disposed by incineration, or alternatively, composting to break down seeds. If seedbank persists, invasive alien plant management and eradication measures should be implemented.

Operational Phase

- Implement an indigenous vegetation maintenance as well as an alien invasive eradication programme within the site development footprint

3.3 Avifaunal Assessment

Biodiversity Africa was appointed to undertake the Avifaunal Impact Assessment for proposed Paardevlei Solar PV and BESS project.

3.3.1 Study Findings

The field survey recorded 50 bird species within the project area through all sampling methods. At the time of the field survey bird species diversity and abundance were moderate to low across the entire project site.

Grassland and Wetland habitat

A total of 35 bird species were recorded by walked transects during the site visit period (**Table 3**). The most abundant species was the African Sacred Ibis followed by the Western Cattle Egret, Common Starling and Egyptian Goose. The bird species diversity is considered low reflecting the transformed and uniform nature of the habitat on site.

Table 3: Recorded bird species within the Grassland and Wetland habitats (Paardevlei site)

#	Common name	Scientific name	# Birds	# Records
1	African Sacred Ibis	*Threskiornis aethiopicus*	89	4
2	Western Cattle Egret	*Bubulcus ibis*	76	5
3	Common Starling	Sturnus vulgaris	20	1
4	Egyptian Goose	*Alopochen aegyptiaca*	18	8
5	Plain-backed Pipit	*Anthus leucophrys*	13	8
6	Cape Canary	*Serinus canicollis*	11	4
7	Cape Crow	*Corvus capensis*	8	2
8	Greater Striped Swallow	Cecropis cucullata	8	1
9	Hadada Ibis	*Bostrychia hagedash*	8	4
10	White-throated Swallow	*Hirundo albigularis*	8	7
11	Cape Spurfowl	*Pternistis capensis*	5	2
12	Fiscal Flycatcher	*Melaenornis silens*	5	4
13	Pearl-breasted Swallow	Hirundo dimidiata	5	1
14	Black Heron	*Egretta ardesiaca*	4	1
15	Blue Crane	*Grus paradisea*	4	1
16	Common House Martin	*Delichon urbicum*	4	1
17	Glossy Ibis	*Plegadis falcinellus*	4	1
18	Jackal Buzzard	*Buteo rufofuscus*	4	3
19	Red-eyed Dove	*Streptopelia semitorquata*	4	3
20	White-breasted Cormorant	*Phalacrocorax lucidus*	4	3
21	Fork-tailed Drongo	*Dicrurus adsimilis*	3	1
22	Karoo Prinia	*Prinia maculosa*	3	3
23	Mourning Collared Dove	*Streptopelia decipiens*	3	4
24	African Hoopoe	*Upupa africana*	2	2

25	African Pygmy Goose	*Nettapus auritus*	2	1
26	Cape Wagtail	*Motacilla capensis*	2	1
27	Kelp Gull	*Larus dominicanus*	2	1
28	Lanner Falcon	*Falco biarmicus*	2	2
29	Ring-necked Dove	*Streptopelia capicola*	2	1
30	Speckled Mousebird	Colius striatus	2	1
31	Black-headed Heron	Ardea melanocephala	1	1
32	Brown-throated Martin	Riparia paludicola	1	1
33	Klaas's Cuckoo	*Chrysococcyx klaas*	1	1
34	Rufous-naped Lark	*Mirafra africana*	1	1
35	Spur-winged Goose	*Plectropterus gambensis*	1	1

Plantation Habitat

A total of 13 bird species were recorded by the point count survey in the plantation/woodlot habitat. Four species were recorded in all plantations surveyed, the Cape Canary, Yellow Canary, Fiscal Flycatcher and Cape White-eye.

The plantation block to the south-west of the project area recorded all 13 species listed in **Table 4** below. The greater diversity of species in this patch is likely due to the presence of Secondary Cape Flats Dune Strandveld as an understory. Of note is the presence of two raptor species the Jackal Buzzard and the Lanner Falcon.

Table 4: Bird species recorded within the plantation habitat (Paardevlei site)

#	Common name	Scientific name	# Birds	# PC stations
1	Cape Canary	*Serinus canicollis*	4	2
2	Fork-tailed Drongo	*Dicrurus adsimilis*	3	1
3	Cape Robin-Chat	*Cossypha caffra*	2	1
4	Karoo Prinia	*Prinia maculosa*	2	1
5	Cape Bulbul	*Pycnonotus capensis*	2	1
6	Jackal Buzzard	*Buteo rufofuscus*	1	1
7	Klaas's Cuckoo	*Chrysococcyx klaas*	1	1
8	Yellow Canary	*Crithagra flaviventris*	1	2
9	Lanner Falcon	*Falco biarmicus*	1	1
10	Fiscal Flycatcher	*Melaenornis silens*	1	3
11	Cape Sparrow	*Passer melanurus*	1	1
12	Ring-necked Dove	*Streptopelia capicola*	1	1
13	Cape White-eye	*Zosterops virens*	1	2

3.3.2 Mitigation measures

Construction phase

- All construction and construction related activities (including parking of vehicles and machinery) must remain within the approved project footprint and must not encroach into areas outside the project footprint. To facilitate this the boundaries of the development footprint areas must be clearly demarcated.
- The Secondary Cape Flats Dune Strandveld to the southwestern portion of the project area outside of the proposed footprint must be declared a No-Go area.
- All project related activities must avoid the Paardevlei, including access roads.
- Lay down areas must be located within previously disturbed areas.
- Laydown areas must be rehabilitated, and only indigenous species must be used.
- Employees must be prohibited from disturbing birds, their young, nests and/or eggs.
- An alien invasive management plan for the project area must be created.
- Only existing access roads must be used and upgraded where necessary.

Operational phase

All incidents of collision with solar panels should be recorded (e.g., name of species, date, location, suspected cause of death).

3.4 Heritage Assessment

Reach Archaeology Consulting were appointed to conduct a Heritage Impact Assessment for the proposed Paardevlei Solar PV and BESS project.

3.4.1 Study Findings

It is unlikely that the proposed Solar PV& BESS development will have a significant negative impact on any archaeological, paleontological, cultural heritage landscapes, objects, materials and/ or resources associated with the Paardevlei site.

In terms of palaeontology, the proposed development site is underlain by sediments of low palaeontological sensitivity (SAHRIS Palaeosensitivity Map). According to the extract from the Council of GeoScience Map, the proposed development site is underlain by Quaternary Sand sediments. As the palaeontological sensitivity of this area is low, it is unlikely that the proposed development will impact on significant palaeontological heritage (Lavin, 2021).

It should also be noted that the subterranean presence of archaeological and/or historical sites, features or artefacts are always a distinct possibility. Therefore, care should be taken during any development activities so that if any of these are accidentally discovered, a qualified archaeologist is to be called in to investigate. This would include the discovery of previously unknown graves, fossil material, archaeological artefacts and/or other heritage sub-surface features and objects.

3.4.2 Mitigation measures

Construction phase

- The Construction Manager and the Environmental Control Officer (ECO) should be informed before construction starts on the possible types of heritage / grave sites and cultural material they may encounter, and the procedures to follow when they find potential heritage sites.

- If heritage and archaeological material and human remains (including graves and burial sites) are uncovered during construction of the proposed development, all work must cease immediately and be reported to the Heritage Western Cape.

3.5 Land contamination assessment

A land contamination impact assessment was be completed by **SRK Consulting (South Africa) (Pty) Ltd.** for the proposed Paardevlei Solar PV and BESS project.

3.5.1 Study Findings

The proposed solar project footprint comprises portions of the following former AECI operational areas:

- Field magazines
- Sulfur Stockpile; and
- Northern Development Area (NDA).

Field magazines

In the Field Magazine Area, the buildings were used to store materials packaged in cartons or drums and no manufacturing occurred. The magazines were linked with a railway line to the production areas and the platform from where products were loaded for transport by rail off-site.

As no manufacturing was conducted in this area, the site assessment was undertaken with a primary focus to ensure that these areas were free of explosive residues. This involved the decontamination of the buildings with respect to explosive material residues. The procedure followed involved the washing down of the building with an alcoholic potassium hydroxide solution, following which the structures were burnt. However, the remediation of these areas did not investigate the potential for asbestos contamination. The safety mounds surrounding the building were then demolished, crushed on-site and sold as aggregate.

During the demolition of the former AECI operations, a crusher plant was commissioned within the field Magazine area to crush demolished buildings. Demolished buildings were crushed and sold as aggregate. There are several stockpiles of crushed material of various sources within the Field Magazine area located around the former crusher plant.

Sportfield Assessment

The area to the north of the field magazines was vacant land, although still located within the explosives area. A review of aerial photographs (dated 1938, 1955, 1973, 1977 and 2000) was conducted to supplement the historical review prior to the development of the De Beers Football Club.

The assessment focused on areas with scarred or disturbed vegetation, buildings and structures which could indicate historical activities. All areas identified during this assessment were subsequently inspected during the site walkover and fieldwork phases of the investigation. The investigation findings were used for locating appropriate test pits for the intrusive site investigations. The historical aerial photographs of the site indicated that the area that was used as a loading area for explosives. No production activities were visible on the aerial photographs reviewed.

No production or storage of explosives is recorded to have taken place within the sportsfield boundaries. The area was used as a staging/loading area for explosives trains. The physical infrastructure associated with these activities included a single building, a railway siding and a road. A storm water drain ran adjacent to the building and a fire break extended from the drain to the nearby eucalyptus tree plantation. An open field grading to another eucalyptus tree plantation was located to the south of the building. These eucalyptus trees have been dying over the past few years and the area is commonly referred to as the "Dead Tree Area". Although the "Dead Tree Area" has been investigated in the past, (S. Doel, 1998), the cause of the die back was not established.

The soil and groundwater in the area was found to be saline. No effluent was generated in the area and no specific Contaminants of Potential Concern (CoPC) were identified during the historic review.

Sulfur Stockpile

The Sulfur Stockpile Area is the footprint of a former strategic sulfur stockpile established in 1967. Following a fire in 1995, the bulk of the sulfur was removed, and the residual soil treated with lime in 1999. In 2010, the area was covered with *c.*300 mm of calcareous dune sand to facilitate the establishment of vegetation.

Several trials have been undertaken to assess the efficacy of remedial technologies. The ex-situ mixing of the soil with lime to neutralise any remaining acidity and incorporate sufficient lime to neutralise potential acidity was trialled in the Sulfur Windrow area (in the field magazine area). This trial yielded poor results and was not considered a viable remediation technique. The windrows are still present and are generally devoid of any vegetation.

Although the actual footprint of the Sulfur Stockpile is not within the boundary of the study area, there is an area immediately adjacent to the sulfur stockpile that falls within the study area and is potentially impacted by the historical sulfur stockpiles and the sulfur windrow area is located within the study area.

The sulfur impacted soil is not considered a human health risk. The soil is, however, considered to present a potential geotechnical risk to the integrity of concrete foundations due to the low pH (<4) and elevated sulfate concentration. Furthermore, the soil pH is too acidic for the establishment of vegetation, as evidenced by the absence of vegetation on the majority of the sulfur windrow area.

Northern Development Area (Farm Lands)

The northern portion of the study area (NDA) was bounded by the former Kynoch fertiliser plant to the east, explosive field magazines to the south, RDM to the west and vacant land / residential areas to the north. This portion of the study area was not part of the former AECI operational areas and was vacant / farm land for the duration of the AECI operations.

A site assessment was conducted of this portion of the AECI site in 2002 (SRK, 2002), as part of an EIA for the potential development of the site. This report concluded that the site was not contaminated.

Contaminants of Potential Concern

Based on a review of the available information regarding historical operations in the study area, the following CoPC were identified.

- pH (acidic or low pH soil) and soluble sulfate (SO4) in the sulfur stockpile area and treatment
- windrows.
- Soluble fluoride (F) from the adjacent phosphate fertiliser operations.
- Nitrate from the explosive residues.
- Chloride (Cl) and EC as general indicators of soil quality.
- Asbestos in the area adjacent to the former Blasting Explosives area where asbestos lagging was used to insulate steam pipes.

3.5.2 Mitigation measures

Two areas have been identified as being contaminated by previous operations at the site:

- The Sulfur Windrows: these windrows of sulfur contaminated soils do not present an unacceptable human health impact per-se but are acidic soil which may present geotechnical risks to structures and inhibit revegetation of their footprint.

- The area represented by sample C2 is contaminated with asbestos fibre bundles. The extent and severity of the asbestos contamination is undefined.

There is no evidence of any pervasive soil contamination arising from past industrial operations in the remaining area of the site, which is considered suitable for the proposed redevelopment with respect to soil quality.

Construction Phase

Based on the above it is recommended that the extent of the asbestos area be delineated and remediated prior to this area being included in the proposed solar development. Alternatively, the impacted area must be delineated and excluded from the proposed development, including access restrictions to the area to protect workers from fugitive dusts containing asbestos fibres.

3.6 Social Impact Assessment

Tony Barbour Consulting was appointed to undertake a Social Impact Assessment (SIA) for the proposed Paardevlei Solar PV and BESS project.

3.6.1 Study Findings

The development of renewable energy (i.e. Paardevlei Solar & BESS project) is strongly supported at a national, provincial, and local level. At a national level development of and investment in renewable energy is supported by the National Development Plan (NDP), New Growth Path Framework and National Infrastructure Plan, which all refer to and support renewable energy. At a local level the development of renewable energy is supported by the City of Cape Town IDP and SDF.

3.5.2 Mitigation measures

Construction Phase

- Where feasible, employ local labour (from the Somerset West Community) for the construction phase of the solar project. Where specialist skills labour is required, this may have to be sourced from outside of the Somerset West Community.

3.7 Glint and Glare Assessment

A Glint and Glare Assessment was conducted by **Future Impact (Pty) Ltd.** for the proposed Paardevlei Solar PV and BESS project.

3.7.1 Study Findings

The assessment was conducted with the objective of determining how 'glint' and 'glare' will affect aviation receptors such as pilots on final approach to the airports, as well as the Air Traffic Control Tower (ATCT) operations. Cape Town International Airport (ICAO: FACT) and Stellenbosch Airport (ICAO: FASH) were identified as facilities that may be exposed to glint and glare impacts. Four 2-mile flight paths and one ATCT were identified as receptors for the Cape Town International Airport. Two 2-mile flight paths were identified for the Stellenbosch Airport. There is no ATCT at the Stellenbosch Airport due to its small size and low aircraft traffic.

The modelling results indicated that the receptors at the airports will be exposed to green glint and glare if Site Layout Plan 01 (Fixed Tilt at 34˚) or Site Layout Plan 02 is implemented. If a 20˚ Fixed Tilt angle is considered for Site Plan 01, no glint and glare exposure will occur. Additionally, Site Layout Plan 03 will also cause no glint and glare exposure to the receptors.

3.7.2 Mitigation measures

It should be noted that although green glare could be experienced by the Air Traffic Controllers at the Cape Town International Airport Control Tower, the intensity of the glare will be mitigated by the distance of the solar project to the Control Tower, the short duration thereof as well as the window tinting that is already in place, and that the project is not on the extended centre line of the main runway (FACT Runway 01/19), but 19km to the South-East of the field.

3.8 Wetland Impact Assessment

Liz Day Consulting was appointed to undertake a Wetland Impact Assessment for the proposed Paardevlei Solar PV and BESS project.

3.8.1 Study Findings

Figure 9 presents a detailed view of the current wetland areas within the solar development site, based on ground-truthing in 2023 to supplement 2018 mapping data. The figure indicates the following:

- Extensive alluvial wetland (*or wetland flats as per Ollis et al 2013's classification*) characterise much of the site, forming a mosaic of disturbed terrestrial areas interspersed with low lying pans and shallow depressions. These are variously vegetated with grasses and indigenous vegetation typical of seasonal wetland conditions, namely stands of *Juncus kraussii* sedge, *Pennisetum macrourum* grass, and (in wetter areas), *Bolboschoenus maritimus* and *Eleocharis limosa*. These areas have not been highlighted for blanket conservation within the site (*see Day 2014; Day 2018*) but do contain areas where the wetlands are in better condition, usually as a result of recovery from disturbance or because of remediation interventions that have contributed to their formation.

- A mosaic of seasonally saturated-to-shallowly-inundated wetland pans (*still classified as wetland flats in terms of Ollis et al 2013),* which were mapped out where they occurred within or immediately abutting the study area (i.e. east and north of the soccer fields). These pans were characterized by *Sarcocornia cf. perenne*, a plant commonly associated with salt marsh conditions, and indicative here of high rates of evapoconcentration, resulting in saline to brackish conditions on the surface during the dry season.

- Wetland depressions within the open area south-west of the sports club grounds, edged to the north and south by dense stands of eucalyptus forest. These depressions are vegetated by dense stands of *Eleocharis limosa* and separated from each other by low berms. The depressions are clearly an artefact of past disturbance, probably linked to the excavation and disposal of contaminated soils. They form an expansive zone of wetland depressions across the site and are likely to provide wet season breeding habitat to frogs, aquatic insects and wading or swimming birds. That said, the extent to which their water quality still reflects past contamination is not known. Thus, while they provide seemingly good quality physical habitat in the form of shallow, standing water pans in the wet season, the extent to which this is compromised by water quality impacts is not known. The pans

were dry at the time of the site assessment. For the purposes of this study, it is assumed that they are not compromised by poor water quality, although a recommendation is that this aspect should be investigated. The depressions are drained by a network of channels and trenches that convey flow during high water periods, to the Marshall Yard Drain.

- A network of trenches and channels across the site, of which the main one comprises the Marshall Yard Drain, which runs west-east across the northern edge of the wetland depressions described above, then swings south, near the south-western corner of the sports club grounds. It is joined here by a channel conveying runoff from the wetland flats immediately north of the sports club boundary fence (mapped as mosaic wetland in Figure 30). The combined flows are also joined in this area by channels / trenches draining the wetland depression mosaic area to the west, and then pass under an internal gravel access road. The channel, densely invaded in places with bulrush (*Typha capensis*), passes south along the edge of another dense eucalyptus forest, to join the Magazine Drain – a channel that runs between the proposed Development Areas 1 and 2, and Development Area 3, in the south. The Somchem Drain runs along the western site boundary and passes into Langvlei and then the Main Drain along with the other main drainage channels. These are all artificial drainage systems, constructed to convey water out of the flat, low-lying wetland-dominated areas. During summer, the channels are usually dry. At the time of the site visit, the Marshall Yard Drain was flowing, from immediately downstream of the road crossing south of the sports club's south-western boundary fence. The trickle flows were found to derive from an overflowing sewer manhole near the culvert, which had clearly been flowing for some time, since the only channel where dense *Typha capensis* was established was the section downstream of the manhole. *Typha capensis* requires permanent saturation to inundation and thrives in nutrient-enriched, fresh (i.e. not brackish) environments (*Hall 1990*).

- A few small wetlands (*classified as wetland depressions*) were noted in places along the margins of the eucalyptus forests, where channeled runoff from surrounding wetter areas passes into the forest areas. Eucalyptus trees have a high-water uptake however, and deeper within the forest areas, there were no signs of significant wetlands although in places, indigenous terrestrial fynbos vegetation (e.g. *Metalasia cf. muricata*) still occurred as a sparse under-story. In the event that the eucalyptus forests were felled, much wetter conditions would be likely to prevail in these and other linked areas.

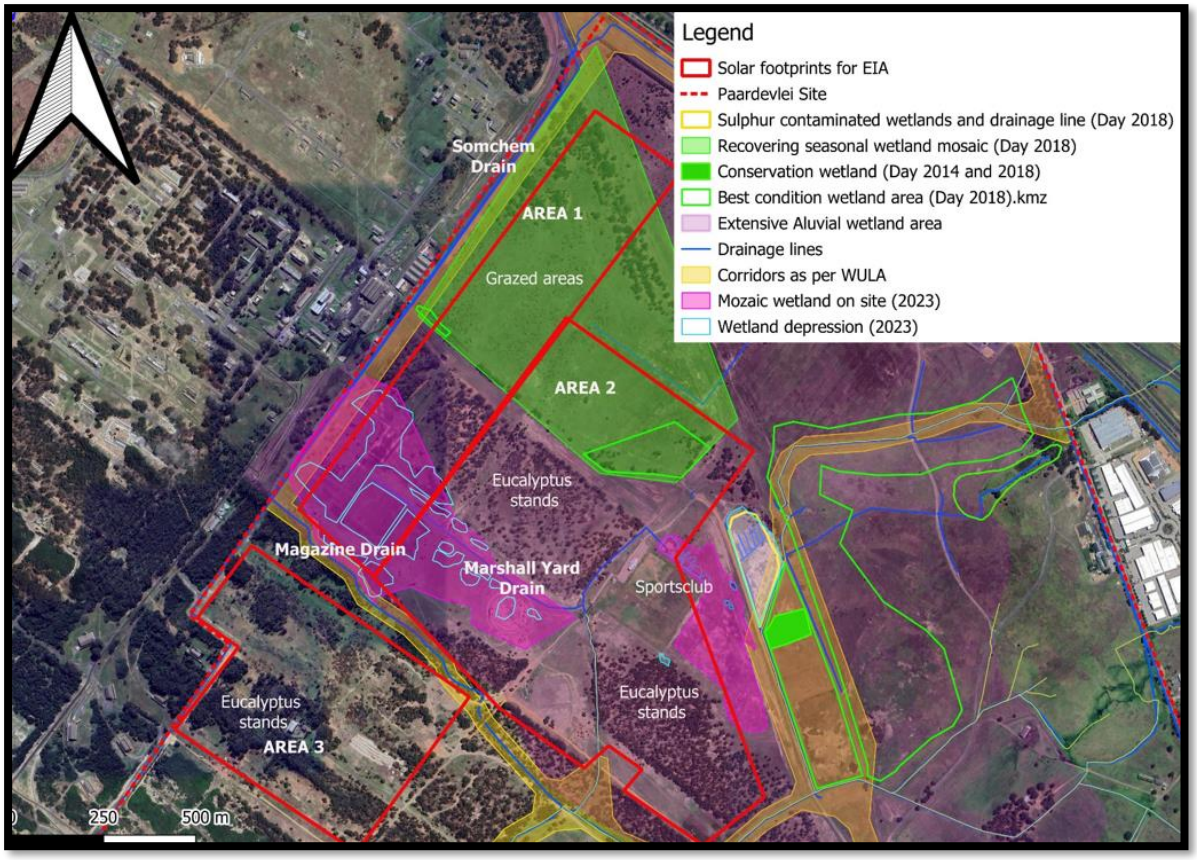

Figure 9: Proposed Paardevlei Solar & BESS development footprint showing present extent of on-site wetlands

In Figure 10 below, the developable areas versus no-go wetland areas are presented, as recommended in the final Wetland Assessment dated October 2024 – attached as Appendix B to the Final EIA Report.

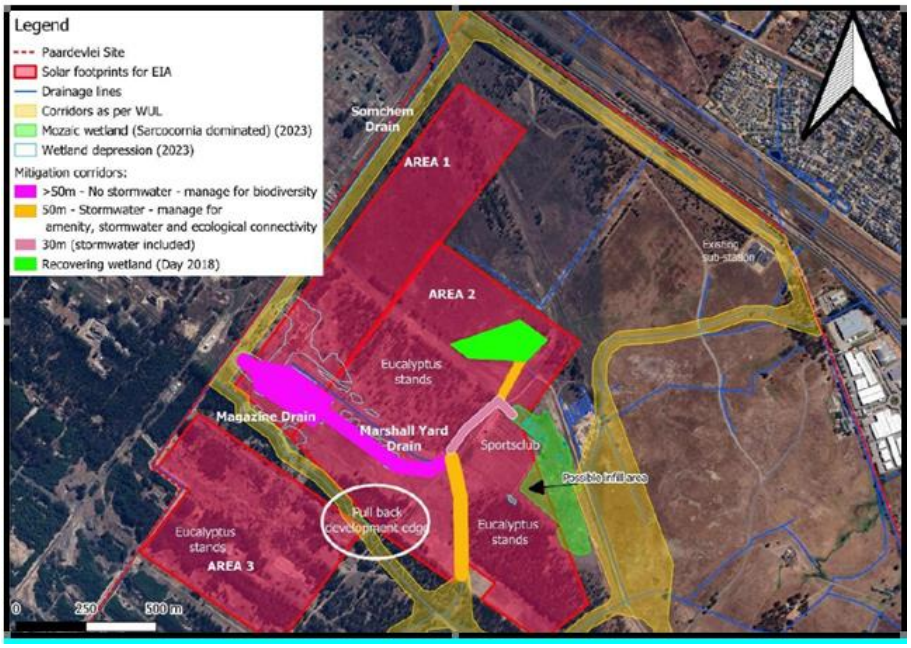

Figure 10: Layout showing the recommended new wetland corridors and areas where the proposed Solar & BESS development should be pulled back

3.8.2 Mitigation measures

The overall stormwater masterplan for the greater Paardevlei site has assumed development of this area and allowed for substantial hydrological-ecological corridors through the site, to prevent ecological fragmentation and ensure sustainable stormwater management. In this context, mitigation measures recommended in this assessment have focused on measures to:

- Allow for conservation and rehabilitation of the depression wetlands in the best condition on the site, and their inclusion in corridors that link to those required in terms of the stormwater master plan for the greater Paardevlei site.
- Address potential impacts to water quality and water quantity as a result of increased hardened surface areas on the site and possible sources of contaminated runoff.
- Reduce impacts to wetland areas that would underlie developed spaces.

The wetland report has also flagged the potential for clearing of eucalyptus forests within the site development footprint to result in unintended consequences such as a raised but contaminated water table that impacts on downstream aquatic ecosystems. This issue requires input from geohydrological specialists.

3.9 Groundwater Impact Assessment

JG Afrika was appointed to undertake a Groundwater / Geohydrological Impact Assessment as part of EIA for the proposed Paardevlei Solar PV and BESS project.

3.9.1 Study Findings

In accordance with SRK (2018) the groundwater quality across the development area is considered to be poor with elevated concentrations of certain hydrochemical parameters of concern reported in the majority of the boreholes sampled. Hydrochemical data obtained during the field investigation (by JG Afrika) and laboratory analysis in November 2023 reiterates the presence of poor-quality groundwater across the site.

3.9.2 Mitigation measures

Construction Phase

- **The geohydrological report has also flagged the potential for clearing of eucalyptus forests within the site development footprint to result in an unintended consequence such as a raised but contaminated water table that impacts on downstream aquatic ecosystems.**
- Specialist (geohydrological) input should inform decision-making around the risk of groundwater level and quality on the Paardevlei site.

- Monitoring of water quality in downstream stormwater channels and the "Langvlei" should be re-introduced before the potential tree felling commences, and the contaminants of concern should be included in the monitoring programme, so that there is at least an understanding of water quality change and/or risk.

3.10 Climate Change Impact Assessment

3.10.1 Study Findings

A potential for climatic change exists and can have both positive and negative impacts on a specific project and in this case, solar PV production. While it is not expected to significantly affect solar insolation, increases in temperature due to anthropogenic climate change can decrease solar power output by reducing PV panel efficiency. Changes in cloud formation can also affect global solar irradiation and therefore affect solar production locally.

According to the City of Cape Town Climate Change strategy (City of Cape Town, 2021), the potential climatic changes that the City faces include significant decrease in annual rainfall, increases in mean temperature and more frequent and intense heat waves, increase in mean sea level and coastal erosion which can all impact the proposed Paardevlei Solar PV and BESS project.

3.9.2 Mitigation measures

The implementation of PV technology that can withstand the following potential climatic change impacts:

- Long term exposure to higher temperatures causing faster ageing of the sensitive material used in PV panels.
- Material damage to PV equipment due to extreme high temperatures.
- Material damage to PV equipment due to wildfires.
- Damage to PV infrastructure due to extreme precipitation, storms and hailstorm.
- Damage to PV infrastructure due to surface water flooding.
- Material damage to PV infrastructure due to extreme winds.
- Increases in dust and sandstorms impacting optimal functioning of PV equipment.

4 ADMINISTRATION AND REGULATION OF ENVIRONMENTAL OBLIGATIONS

Details of a general management structure are presented in **Figure 11** below (this will however be confirmed after the project goes out to tender and formal appointments are made). All official communication and reporting lines including instructions, directives and information shall be channelled according to the organisational structure.

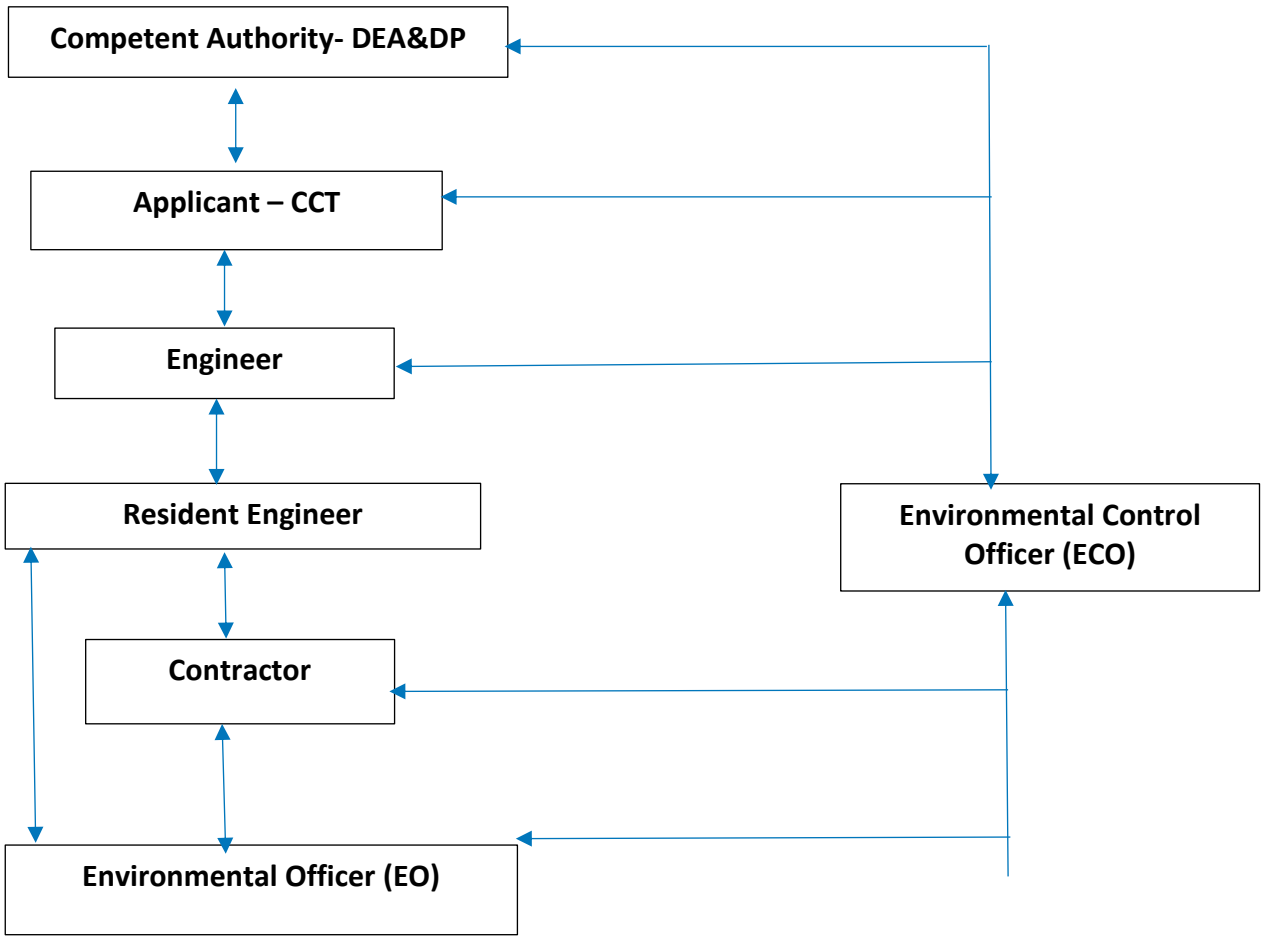

Figure 11: EMPr Implementation Organisational Structure.

4.1 Roles and Responsibilities

The implementation of this EMPr requires the involvement of several role players, each fulfilling a different but vital role to ensure sound environmental management during the implementation of the proposed project.

4.1.1 Department of Environmental Affairs and Development Planning (DEA&DP)

DEA&DP is the designated authority responsible for authorising this EMPr. DEA&DP has the authority to enforce legal action if the City of Cape Town: Sustainable Energy Markets does not comply with the relevant legislation, conditions of the Environmental Authorisation (EA) and this EMPr.

DEA&DP would need to approve any amendments that may be required to the management outcomes of the EMPr and may also perform inspections to assess compliance with the relevant legislation, the EA and the EMPr.

4.1.2 City of Cape Town: Sustainable Energy Markets

City of Cape Town: Sustainable Energy Markets, as the Applicant, has overall environmental responsibility to ensure compliance with the relevant legislation, the EA and this EMPr. City of Cape Town: Sustainable Energy Markets is also ultimately responsible for the financial cost of all environmental management measures. City of Cape Town: Sustainable Energy Markets must ensure that any person acting on their behalf complies with the relevant legislation, the EA and this EMPr.

City of Cape Town: Sustainable Energy Markets is also responsible for the appointment of the Engineer, Contractor, Environmental Control Officer (ECO) and Environmental Auditor and shall address any issues pertaining to the environment at the request of the Engineer, ECO and/or the environmental auditor.

4.1.3 Project Engineer

The Project Engineer shall oversee the planning, design and construction phases of the project on behalf of City of Cape Town: Sustainable Energy Markets. The Engineer shall appoint a Resident Engineer (RE) or Engineer's Representative to act as the on-site implementing agent.

The Engineer shall address any site problems pertaining to the environment at the request of the RE and / or the ECO and shall also be responsible for issuing penalties / fines for contraventions of the EA and EMPr.

4.1.4 Resident Engineer

The Resident Engineer (RE) shall act as the Engineer's on-site implementing agent and carries the responsibility to ensure that the Contractor undertakes their construction activities in such a way that the City of Cape Town: Sustainable Energy Market's environmental responsibilities are not compromised and that the activities are executed in compliance with the EMPr and EA. The RE shall assist the ECO where necessary, and shall have the following responsibilities in terms of the implementation of this EMPr:

- Reviewing and approving the Contractor's Method Statements (MS) (with input from the ECO where necessary).
- Monitoring and verifying that the EMPr and MSs are adhered to at all times and taking action if specifications are not followed.
- Keeping a photographic record of construction activities on site.
- Assisting the Contractor in finding environmentally responsible solutions to problems with input from the ECO where necessary.
- Recommending to the Engineer the removal of person(s) and / or equipment not complying with the EMPr specifications.
- Recommending to the Engineer the issuing of fines for transgressions of the EMPr; and
- Recommending to the Engineer delaying any construction activity if he / she believes the integrity of the environment has been or is likely to be seriously jeopardised.

4.1.5 Contractor

The Contractor will have the following responsibilities:

- To appoint a suitably qualified Environmental Officer (EO) for the full duration of the contract.
- To implement all provisions of the EMPr and EA.
- To ensure that all construction staff are familiar with the EMPr and EA requirements.
- To monitor and verify that negative environmental impacts are avoided or kept to a minimum.
- To make site personnel aware of environmental issues and ensure that they show adequate consideration of the environmental aspects of the project.
- To prepare the required Method Statements.
- To report any incidents of non-compliance with the EMPr and EA to the ECO and RE.
- Ensure that appropriate corrective actions are implemented immediately to rectify identified incidents of non-compliance; and
- To rehabilitate any environmental damage caused by the Contractors negligence and must be undertaken to the Engineers and ECO satisfaction and approval.

Failure to comply with the EMPr and EA may result in fines and reported non-compliances may also result in the Engineer suspending the operation causing the non-compliance.

4.1.6 Environmental Officer (EO)

The Contractor shall, before commencement of construction, appoint a suitably qualified and experienced person to fulfil the function of the EO. The EO's functions could be performed by the Contractor's Dedicated EO (DEO) or an independent environmental consultant. The EO must be appropriately trained in environmental management and possess the skills necessary to impart environmental management awareness training to all personnel involved in the contract. The EO shall be responsible for the on-site implementation of the requirements of the EMPr, EA and any additional environmental licences or permits, as appropriate.

The EO's duties shall include the following:

- Monitoring and verifying that the EA, EMPr and Method Statements are adhered to at all times and reporting immediately to the ECO and RE.
- Daily site inspections.
- Keeping accurate and detailed records of these inspections.
- Monitoring and verifying that environmental impacts are avoided or kept to a minimum.
- Submission of regular (weekly) written site inspection reports to the RE and ECO.
- Assisting the RE and ECO in finding environmentally responsible solutions to problems.
- Reporting any environmental incidents and / or non-compliance with the EA and EMPr requirements to the RE and / or the ECO.
- Keeping a register of complaints on site and recording community comments and issues, and the actions taken in response to these complaints.

4.1.7 Environmental Control Officer

The ECO will be an independent environmental consultant appointed by the Applicant / Engineer to objectively and regularly monitor / audit the Contractor's compliance with the conditions of the EA and any additional environmental licences or permits issued for the project, and the requirement of the approved EMPr. The ECO must be appointed before commencement of construction. The ECO shall undertake site inspections for the full duration of the construction contract.

The ECO's duties shall include the following:

- Implementing the ECO responsibilities as stipulated in the EA.
- Verifying that all the required environmental licences and permits have been obtained, as appropriate.
- Advising the Contractor and / or the RE on environmental issues within defined construction areas.
- Conducting an environmental awareness training session with the site management staff.
- Reviewing the adequacy of Contractor Method Statements.
- Undertaking site visits to assess compliance with the EMPr, EA and any additional environmental licences or permits.
- Keeping a photographic record of progress on site from an environmental perspective.
- Keeping a record/log of all environmental incidents and non-compliances.
- Assisting the Contractor and / or the RE in finding environmentally acceptable solutions to construction problems.
- Verifying the EO site inspection reports, records and registers.
- Recommending additional environmental protection measures should this be necessary.
- Providing a report back on the environmental issues at site meetings (if required).
- Compiling monthly environmental audit reports on compliance with the relevant conditions of the EA and any additional environmental licences or permits, and the requirements of the EMPr. (see Section 4.9 for further details regarding auditing procedures).

The ECO shall communicate directly with the RE. Should problems arise on site that cannot be resolved between the ECO and the RE, the ECO shall take the matter up with the Engineer and / or City of Cape Town: Sustainable Energy Markets: Energy Directorate. If the City of Cape Town: Sustainable Energy Markets: Energy Directorate does not respond, the ECO shall take the matter up with DEA&DP.

4.2 EMPr Administration

Hard copies of the EA and this EMPr shall be kept at the construction camp site office. All relevant personnel shall be required to familiarise themselves with the contents of this document.

Any recommended amendments to the EMPr outcomes must be approved by DEA&DP and communicated to the relevant stakeholders, as per the EIA Regulations, before the amendments to the EMPr are implemented. The ECO and/or environmental auditor shall identify the need for any amendments to the

EMPr document. Records will be kept in the document indicating changes that have been made. The ECO will be responsible for the distribution of copies of the amended EMPr document to all relevant personnel.

The RE may order the Contractor to suspend part of the works if the Contractor fails to comply with the specifications set out in the EA, EMPr and Method Statements. Such suspension will be enforced until compliance is achieved.

4.3 Information Boards

The Contractor shall be responsible for erecting general information boards on site. The general information board shall provide the name and contact number of the EO, to ensure that the public has access to the EO to request information and / or to lodge any complaints. The EO shall report complaints to the RE and ECO. One of these information boards shall be erected at the main construction camp.

4.4 Method Statements (MS)

The Contractor shall submit written Method Statements for approval to the RE and input from the ECO. The Method Statements must cover applicable details with regard to the following:

- Type of construction activity to be undertaken.
- Location of the activity.
- Environmental aspects and impacts that might result from an activity.
- Methodology stating impact avoidance or minimisation for each activity or aspect.
- Materials to be used during construction activities.
- Equipment that will need to be brought to the construction site.
- Storage of materials and equipment on site.
- Action plan indicating how a leak or spillage will be attended to on site.

Method Statements that are required from the Contractor:

- Vegetation Clearing.
- Layout of construction camp and laydown areas.
- Traffic accommodation and diversions plan.
- Containment, storage, handling and disposal of hazardous substances.
- Access and construction work in watercourse.
- Management of general and hazardous waste.
- Dust Control.
- Erosion and sedimentation control.
- Alien vegetation control.
- Site Rehabilitation.

The RE and the ECO may request additional Method Statements.

Method Statements must be submitted to the RE and ECO ten (10) days prior to the commencement of construction. It should be noted that the Method Statements that are submitted must contain sufficient information and detail to enable the RE and ECO to review and sign off.

It must be noted that work shall not commence until the RE has approved the Method Statements with input from the ECO. The failure to submit the Method Statements to the RE, may result in the suspension of part or all of the works concerned until a Method Statement has been submitted and approved. Any damage that may be caused to the surrounding environment shall be rehabilitated at the Contractor's cost.

4.5 Environmental Awareness Training

Before the commencement of any work on site, the Contractor's site management staff shall attend an environmental awareness training course, presented by the ECO. The Contractor shall liaise with the ECO prior to the commencement date to fix a date and venue for the course. The Contractor shall provide a suitable venue with facilities and ensure that the specified employees attend the course.

4.6 Meetings

The ECO shall meet (or otherwise liaise) with the RE and EO on a monthly basis, or more frequently as may be required during the initial stages of the project. The ECO shall prepare a monthly environmental audit report and provide feedback (written and / or oral) at monthly site meetings.

4.7 Record of Activities

The EO shall keep a record of activities on site, including but not limited to:

- Method Statements.
- Site Inspections.
- Internal Site Audits and Monitoring Reports.
- Issues arising on site.
- Cases of non-compliance with the EA and EMPr.
- Penalties / fines issued.
- Complaints received and correction action taken.
- Environmental incidents and correction actions taken.

The RE and EO shall keep photographic record of all areas that will be impacted by the construction activities, prior to construction activities commencing. The ECO shall monitor all sensitive environments as indicated below and which may include photographic monitoring:

4.8 Fines

A fines system shall be implemented to ensure compliance with the EA and EMPr (see **Annexure G**).

Where the Contractor or their sub-contractors causes damage to the environment or fails to comply with any of the environmental specifications of the EA or EMPr, the Contractor will be liable to a pay a fine. The Contractor is deemed not to have complied with the EMPr if:

- There is evidence of contravention of the EMPr specifications, including any non-compliance with an approved Method Statement.
- Construction activities take place outside the defined boundaries of the site.
- Environmental damage due to negligence.
- The Contractors fails to comply with instructions or corrective actions that have been issued by the RE or ECO within a specific time period.
- The Contractor fails to respond adequately to complaints.

4.9 Monitoring and Auditing Procedures

The Contractor shall establish an internal audit and review procedure to monitor the day-to-day implementation of the EA and EMPr requirements. The day-to-day monitoring and verification that the EA and EMPr are being adhered to shall be undertaken by the EO. The EO audit reports shall be submitted to the RE and ECO. Internal audits shall include an assessment of performance against the requirements of other environmental licences or permits (e.g. water use authorisation, flammable substance certificates, etc.).

The ECO shall visit and inspect the site on a monthly basis to ensure that adequate procedures are being implemented and to audit compliance with the EA and EMPr requirements, as well as the stipulations of other environmental licences or permits issued for the project. The ECO shall address any queries to the RE. If the queries cannot be resolved at this level, they will be referred to the Engineer and, if necessary, to the City of Cape Town: Sustainable Energy Markets.

Furthermore, the City of Cape Town: Sustainable Energy Markets must ensure that compliance with the conditions of the EA and EMPr is audited by an independent person, with the relevant expertise and experience.

The respective environmental audit reports must contain all information required as set out in Appendix 7 of the EIA Regulations, 2014 (as amended) and must be submitted to DEA&DP for consideration. The following information must, amongst others, be included in the respective audit reports (as appropriate):

- Verifiable findings on the level of compliance with the conditions of the EA and requirements of the EMPr (and whether this is acceptable or not).
- The extent to which the environmental management measures specified in the EMPr achieved the environmental outcomes. Any shortcomings must be highlighted and the need for any changes to the environmental management outcomes and measures must be identified.
- After completion of construction, provide comment on the state of rehabilitation of the site, provide assurance that there are no outstanding issues relevant to the construction phase and identify any

environmental issues which will need ongoing monitoring / auditing and action during the maintenance phase of the project.

Site access must be granted and the internal audit reports, ECO reports and other relevant documentation must be produced to any authorised official representing the Competent Authority (DEA&DP) who requests to see it for the purposes of assessing and / or monitoring compliance with the conditions contained therein.

5 PART 1 – CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

5.1 Implementation and management plan

This section provides the required mitigation and environmental management measures that the Contractor must adhere to in order to reduce / limit negative environmental impacts to the biophysical, social and economic environments during the project's construction phase.

Table 5 outlines the potential environmental impact, the risk rating, the recommended control measures, responsible parties and monitoring frequency. Where relevant, this table would be updated by the ECO in consultation with the RE and Contractor to ensure that the project activities and responsibilities are correctly assigned once the project commences

Table 5: Implementation and Management Plan

ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURES		RESPONSIBLE PERSON(S)	MONITORING FREQUENCY	RISK RATING
6.1. Construction Camp Establishment		**Contractor / DEO**	**Daily monitoring**	**Medium - Low**
Potential Impact	• Disturbance to wetlands on site. • Disturbance to residential area.			
Environmental Objectives	• Ensure that the location of the site camp and material laydown area are located away from sensitive receptors such as the wetland areas.			
Mitigation Measures	• The site camp must be located at least 30 m away from any aquatic / wetlands features and sensitive environments. • Location of the site camp to be approved by the RE and ECO prior to establishment. • An incident and complaints register to be generated for the project. • Site camp to be suitably demarcated.			

ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURES		RESPONSIBLE PERSON(S)	MONITORING FREQUENCY	RISK RATING
	• Visual elements of the site camp must be screened with fencing/netting. Fencing to include signage displaying relevant warning information and contact numbers. • Suitable eating areas shall be provided for staff, including safe drinking water and refuse bins with lids. • Stormwater management measures must be implemented to ensure that water does not drain through the site. • Sufficient toilets shall be provided (1 toilet per 15 staff). Toilets to be regularly maintained and properly secured. If chemical toilets are used, ensure that no spillage occurs during emptying. • Ablution facilities must be located at least 30m away from aquatic features. • Fires for heating, cooking or burning of any materials will not be permitted. • Non-potable water to be used for construction activities, as far as possible. Non-potable water to be responsibly sourced and used. • Contractor to implement water saving measures on site to limit water wastage.			
Evidence	• Method Statement, including site camp layout. • Incident and complaints register.			
6.2. Site / Working Area Establishment		**Contractor / DEO**	**Daily monitoring**	**Medium-Low**
Potential Impact:	• Impact on wetland environment and sensitive vegetation.			
Environmental Objectives	• Ensure that all construction activities remain within the approved working areas. • To minimise the construction area and disturbance of the footprint of the construction area. • Ensure that any no-go areas are clearly demarcated, and staff are made aware of these areas for the duration of the project.			
Mitigation Measures	• Demarcate the working areas, as required, prior to the construction activities. • All construction activities, stockpiling etc, to remain within the identified and approved working areas. • Suitable signage to be erected to keep the public outside of construction areas.			

ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURES		RESPONSIBLE PERSON(S)	MONITORING FREQUENCY	RISK RATING
	• Any excavations to be adequately demarcated and signposted. • The Contractor must ensure that traffic management measures are implemented during the construction phase. The traffic management measures must be approved by the RE and the appointed Health & Safety Agent. **No-go areas** • Only vegetation within the authorised development footprint of the solar panels may be removed. Vegetation between the solar panels may not be removed or disturbed. • Residential and commercial properties surrounding the site will be regarded as no-go areas.			
Evidence	• Method Statement on how the working area will be demarcated, including the management of no-go areas.			
6.3. Solid Waste Management		**Contractor / DEO**	**Daily monitoring**	**Low - Medium**
Potential Impact	• Contamination of soil, surface water and groundwater if not properly handled and disposed of. • Impact on wildlife and neighbouring residential areas as a result of littering and windblown litter/waste.			
Environmental Objectives	• Properly manage all waste types on site and encourage recycling and re-use of materials as far as possible. • Ensure the correct disposal of waste that us generated on site and reduce the volume of waste requiring disposal.			
Mitigation Measures	• Compile Method Statement which must outline how waste will be managed on site, temporary storage areas, waste types to be recycled, as well as methods of disposal. • No on-site burying, burning or dumping or waste is allowed. • Different waste types to be stored separately. • Different waste types to be stored separately. • Contractor to investigate options of 'take back' policies for any materials, packaging etc, not used on site. Examples could include used pallets, plastic wrapping, etc, prior to recycling materials. • Any vegetation removed during site clearance, not intended as part of the rehabilitation, must be chipped for processing as mulch or utilised for composting purposes			

ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURES		RESPONSIBLE PERSON(S)	MONITORING FREQUENCY	RISK RATING
	• Implement measures, as far as possible, for the recycling and/or recovering of materials from the solar PV infrastructure in the event of partial or complete replacement when reaching 'end-of-life' or undergoing replacement maintenance repairs. • Signage must be used to prevent illegal dumping. There must be visible signage to prevent any littering and illegal dumping from occurring on site throughout the entire development stage of the proposed area including the operational phase. • All temporary structures, equipment, material, and facilities used or created on-site during the construction phase, are to be removed and appropriately recycled or disposed at a licenced landfill site. • **A waste management plan must be included for all stages of this project.**			
	<u>General Solid Waste</u> • The site must be kept neat and tidy and free of litter and waste at all times. • Solid waste to be temporarily stored in refuse bins with lids, skips, or other suitable enclosed containers. • Solid wate to be disposed of once storage containers are full. • Solid waste to be disposed of a registered landfill site. • Disposal slips to be retained.			
	<u>Hazardous Waste</u> • Hazardous waste to be stored in a demarcated areas (i.e. impermeable area) prior to disposal. • Hazardous waste includes contaminated hydrocarbon soils, oily rags, etc. • Hazardous waste to be disposed of at a registered landfill site and proof of safe disposal slips retained.			
Evidence	• Method Statement. • Safe disposal slips. • Waste management plan (for all stages of the project).			

ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURES		RESPONSIBLE PERSON(S)	MONITORING FREQUENCY	RISK RATING
6.4. Erosion and Sedimentation Control		**Contractor / DEO**	**Daily monitoring**	**Low - Medium**
Potential Impact	• Loss of topsoil.			
Environmental Objectives	• To effectively manage stormwater on site to prevent erosion, manage sedimentation and protect surrounding biophysical environment.			
Mitigation Measures	<u>Disposal of wastewater:</u> • Stormwater run-off to be properly managed within all working areas and site camp. • Areas that are susceptible to erosion shall be protected by installing temporary or permanent drainage works as soon as possible to prevent scouring / washing away of slopes or other areas. • All runnels or erosion channels that develop during construction to be backfilled, compacted and restored to a reasonable condition. • Contractor to determine appropriate erosion protection measures, if needed, in consultation with the ECO. • No polluted run-off must leave site or run into the adjacent and surrounding environments.			
Evidence	• Method Statements • Proof of disposal of contaminated wastewater			
6.5. Surface and Groundwater Management		**Contractor / DEO**	**Daily monitoring**	**Medium - High**
Potential Impact	Impact to groundwater and surface water quality of the onsite wetlands and surrounding environment.			
Environmental Objectives	• Prevent contaminated water entering groundwater and wetland (seep wetland). • Contain all contaminated / polluted construction wastewater on-site for safe disposal.			
Mitigation Measures	<u>Disposal of wastewater:</u> • Compile a Method Statement which must outline how wastewater (water containing cement, chemical, hydrocarbons, paints, etc) will be managed on site, as well as the method of disposal. • No contaminated water may be released into the natural ground or off-site into the surrounding and adjacent environment.			

ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURES		RESPONSIBLE PERSON(S)	MONITORING FREQUENCY	RISK RATING
	• Wastewater shall be removed to a licensed disposal site. • The Contractor must notify the ECO of any pollutions incidents that occur on site.			
Evidence	• Method Statements. • Proof of disposal of contaminated wastewater			
6.6. Cement and Concrete Mixing		**Contractor / DEO**	**Daily monitoring when cement mixing is taking place**	**Medium - High**
Potential Impact	• Impacting natural ground pH balance, which could also negatively impact on groundwater and surface water if cement or concrete enters the stormwater system / or wetlands on Site 2.			
Environmental Objectives	• Proper handling and management of cement and cement wastewater. • Prevent wastage.			
Mitigation Measures	• The location of batching site must be approved by the ECO and RE, if required. • Cement must not be mixed directly onto natural ground. • Cement must be mixed on an impermeable surface that is large enough to contain the cement and any cement wastewater. • All wastewater resulting from the mixing of cement must be disposed of via wastewater management system. • Cement wastewater storage areas must not be allowed to overflow. • Empty cement bags must be stored in weatherproof containers to prevent windblow cement dust from entering surrounding environments. • Cement bags to be disposed of at a licensed waste disposal facility. • Cleaning of equipment and flushing of cement mixers must not result in the pollution of the surrounding environment. All contaminated wastewater must be collected and carefully disposed of in a manner approved by the ECO.			

ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURES		RESPONSIBLE PERSON(S)	MONITORING FREQUENCY	RISK RATING
Evidence	• Method Statement			
6.7. Dust and Noise Management		**Contractor / DEO**	**Monitoring during dust & noise generating activities.**	**Low-Medium**
Potential Impact	• Impact on visibility for driving, walking etc. • Noise disturbance due to construction-related noise (limited only to people moving through the area).			
Environmental Objectives	• Limit dust impacts as far as possible and to an acceptable level. Limit construction-related noise to acceptable levels.			
Mitigation Measures	• Exposed surfaces must be limited and monitored for dust. • Fine material stockpiles must be covered. • Maintain ground cover for as long as possible to reduce the total surface areas that is exposed to wind. • Loose material stockpiles (such as topsoil, sand etc) must located in sheltered areas that are located away from the roads. • Dust control measures, such as covering or wetting of soil must be implemented. • Vehicle speed limits on site must be kept to a minimum. • Non-potable water to be used for dust suppression. • Staff to be provided with the correct PPE if dust is generated for long period on site.			
	<u>Noise</u> • Limit noise levels (e.g. install and maintain silencers on machinery). • Provide protective wear for worker (i.e ear plugs). • Ensure that the construction vehicles and machinery are maintained regularly to reduce noise generation. • Construction activities must remain compliant with the *Western Cape Noise Regulations, PN 200 of 2013*.			

ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURES		RESPONSIBLE PERSON(S)	MONITORING FREQUENCY	RISK RATING
	• **Working hours during the construction phase (08h00 – 17h00) must be strictly enforced unless permission is given. Permission must not be granted without consultation with the local residents and businesses by the Environmental Officer.** • **Residents and businesses that are located adjacent to the development must be informed in writing 24 hours prior to any planned activities that will be unusually noisy or any other activities that could reasonably have an impact on the adjacent sites.**			
Evidence	Method Statement			
6.8. Materials Management and Handling		**Contractor / DEO**	**Daily monitoring**	**Low**
Potential Impact	• Loss of materials and equipment due to poor management			
Environmental Objectives	• Ensure proper management and handling of all materials and equipment. • Prevent wastage (e.g. poor storage and planning).			
Mitigation Measures	• All delivery vehicles must be shown and instructed of offloading areas, no-go areas, etc. • All materials must be secured during transit. • Loads including, but not limited to sand, asphalt, stone chip and waste materials, must be appropriately covered to prevent them from spilling from the vehicle during transit. • All roads must be kept clean of construction materials at all times. • All delivery vehicles must adhere to all the speed limits and road ules. Construction activities must not cause any delays or inconvenience to be surrounding users and residents. • All manufactured or imported materials must be stored within the Contractor's site camp, where possible. • All stockpiling of material must place in designated areas and should not pose a visual impact to the surrounding environments / residents. • All stockpiling areas are to be agreed upon by the RE and ECO.			

ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURES		RESPONSIBLE PERSON(S)	MONITORING FREQUENCY	RISK RATING
	Topsoil • Where applicable, 150mm of topsoil shall be stripped before bulk earthworks commences and stockpiled separately. • Topsoil must not be compacted and should be protected from wind and rain (e.g. wetting, covering, etc) • Topsoil stockpiles should not exceed 2m in height. • Monitor stockpiles for weeds and remove as and when they appear. • Topsoil should be used again during rehabilitation of the site.			
	Spoil • Spoil stockpiles must be protected from wind and rain (e.g. wetting, covering, etc). • Spoil stockpiles must be clearly separated from topsoil stockpiles. • Excess spoil to be disposed of if no alternative options for its used have been identified.			
Evidence	Method Statement for materials handling and management.			
6.9. Hazardous Substances		**Contractor / DEO**	**Daily monitoring**	**Medium**
Potential Impact	• Impact on stormwater and surrounding environment if any spills occur which are not contained.			
Environmental Objectives	• Ensure the proper handling, storage and management of hazardous substance to prevent impacts to the natural environment.			
Mitigation Measures	• Compile a Method Statement detailing hazardous substances, fuels, oils, bitumen etc., to be brought to site, storage measures, quantities, refuelling details and disposal methods, as well as a spill response plan and procedures for any spills / incidences. • Applicable signage must be in place at all storage areas. • A spill kit must be made available for the treatment of hazardous chemical spills. Hazardous Chemicals			

ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURES		RESPONSIBLE PERSON(S)	MONITORING FREQUENCY	RISK RATING
	• Hazardous chemical substances (as defined in Regulations for Hazardous Chemical Substances GN 1179 (1995) and the Occupational Health and Safety Act 181 of 1993) used during construction shall be stored in designated storage areas, when not in use. • Relevant Material Safety Datasheets (MSDS) must be available on site for all hazardous substances. • Storage areas must be enclosed with lockable access to control and limit access. • The surface under the storage area shall be protected against spills (i.e. impermeable) to the satisfaction of the RE and ECO.			
	<u>Fuels and Oils</u> • The Contractor shall ensure that all liquid fuels and oils are stored in containers/jerrycans with lids, which are kept firmly shut. • Areas for the storage of fuels and other flammable materials shall comply with standard fire safety regulations. All empty and externally dirty containers/jerrycans, etc., shall be sealed and stored on a waterproof/impermeable surface. • Bunded area to be provided for the storage of large volumes of fuel. • Adequate precautions shall be provided to prevent spillage during re-fuelling on site and work areas, e.g. making use of drip trays during re-fuelling. • Drip trays to be provided for stationary plant. • Old oil to be collected for recycling and stored on an impermeable surface (with sides to contain any spills) prior to collection by a service provider.			
Evidence	• Method Statement • On-site spill kit and drip trays • MSDS's			
6.10. Fire Control		**Contractor / DEO**	**Weekly Monitoring**	**Low - Medium**

ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURES		RESPONSIBLE PERSON(S)	MONITORING FREQUENCY	RISK RATING
Potential Impact	• Fire leading to damage to equipment, properties, and injuries, etc.			
Environmental Objectives	• Prevent damage caused by fire by quick response times. • Ensure that staff are trained in how to react should a fire breakout. • Ensure the proper storage and management of hazardous materials.			
Mitigation Measures	• Contractor to appoint a fire safety officer who shall be responsible for ensuring the immediate and appropriate actions in the event of a fire. • Basic and appropriate firefighting equipment must be on site at all times and easily accessible. • Fire extinguishers to be located in hazardous and fuel storage areas and any other applicable areas on site. • Staff must be trained to use the firefighting equipment. • Designated smoking areas must be allocated with containers for cigarette butts. • Relevant contact numbers for local firefighting services must be included on the emergency list.			
Evidence	• Provide details of appointed fire safety officer.			
6.11. Temporary Closure		**Contractor / DEO**	**Prior to temporary closure**	**N/A**
Environmental Objectives	To ensure that all materials are properly secured, waste is removed, and the site is clean and tidy.			
Mitigation Measures	• Should the site be temporarily closed for longer than four (4) days, the ECO must check the site to ensure the following conditions are inspected and report in terms of compliance. <u>Fuels / flammables / hazardous materials stores</u> ○ Fuel stores are as low in volume as possible. ○ There are no leaks. ○ The store is secure and locked. ○ Fire extinguishers are services and accessible. ○ The area is secure from accidental damage through vehicle collision and the likes.			

ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURES	RESPONSIBLE PERSON(S)	MONITORING FREQUENCY	RISK RATING
	○ Emergency contact numbers are available and displayed. ○ Bunded areas are emptied of any contaminated wastewater that may have collected in the bund. <u>Safety</u> ○ There is an inspection schedule and log for use by security or contracts staff. ○ All trenches are secured, where applicable. ○ Fencing and barriers are in place in accordance with the Occupational Health and Safety Act (No. 85 of 1993) ○ Applicable notice boards are in place and secured. ○ Security personnel have been briefed and have the facilities to contact or be contacted by relevant management and emergency personnel. ○ Night hazards such as reflectors, lighting, traffic signage, etc., have been checked. ○ Material stockpiles are secured. <u>Water contamination and pollution</u> ○ Cleared areas and material stockpiles are covered to prevent dust issues on site. ○ Hazardous fuels stores are secure. ○ Cement materials stores are secure. ○ Mobile toilets are empty and secured to the ground or removed from site by the service provider. ○ Refuse bins are empty and secured. ○ Drip trays are empty and secure.		
Evidence	• Temporary Closure Checklist.		
6.12. Rehabilitation	**Contractor / DEO**	**Prior to completion of construction activities**	**Low**

ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURES		RESPONSIBLE PERSON(S)	MONITORING FREQUENCY	RISK RATING
Potential Impact	• Disturbed areas not rehabilitated adequately could lead to erosion and invasion of alien vegetation.			
Environmental Objectives	• Rehabilitate disturbed areas after construction to reduce the impact and disturbance associated with construction activities			
Mitigation Measures	• All construction materials shall be removed from the site on completion of construction activities. • Disturbed site camps and laydown areas must be reshaped to the original topography and removed topsoil returned to the original position when works are completed			
Evidence	• Rehabilitation Plan.			

6 PART 2: OPERATIONAL ENVIRONMENTAL MANAGEMENT PLAN

6.1 Implementation and management plan

This section provides the required mitigation and environmental management measures that the Project Proponent must adhere to in order to reduce / limit negative environmental impacts to the biophysical, social and economic environments during the project's operational phase.

This section provides the required mitigation and environmental management measures to be implemented during the operation phase in order to reduce / limit negative environmental impacts to the biophysical environment.

6.1.1 Solid Waste

- Ensure the correct disposal of all waste that is generated during the operational phase and reduce volume of waste requiring disposal.
- Different waste types must be stored separately.
- CCT to investigate options of "take-back" policies for any materials, packaging, etc., not used during the operational phase. Examples could include used pallets, plastic wrapping, etc., prior to recycling materials.
- Solid waste must be temporarily stored in refuse bins with lids, skips, or other suitable enclosed containers.
- No on-site burying, burning or dumping of waste is allowed.
- Solid waste to be disposed of at a registered landfill site. Disposal slips must be retained.

6.1.2 Hazardous Waste

- Hazardous waste must be stored in a demarcated area (i.e. impermeable area) prior to disposal.
- Hazardous waste includes contaminated hydrocarbon soils, oily rags, used oil etc. and e-waste (solar panels and associated electronic equipment).
- Hazardous waste must be disposed of at a registered landfill site and proof of safe disposal slips retained.

6.1.3 Washing of Solar Panels

- It is recommended that solar panels are washed using water with no chemicals, as soaps/chemicals could potentially cause soil and surface/groundwater contamination.
- The CCT to investigate the suitability of utilising rainwater or borehole water for the cleaning of solar panels instead of potable water.
- Prevent contaminated water from entering groundwater and surrounding environment.
- Contain all contaminated / polluted wastewater on-site for safe disposal.

6.1.4 Vegetation Management and Clearing

- The site should be monitored for any invasive alien plant growth. Any invasive alien plants on site should be removed on an ongoing basis.
- Clearance of alien vegetation shall be conducted as per the requirements of the Conservation of Agricultural Resources Act (Act No. 43 of 1983) and National Environmental Management: Biodiversity Act's (Act No. 10 of 2004) Alien Invasive Species Regulations, as amended.
- Alien vegetation clearing must also be undertaken in line with best practice guidelines. The following guideline documents may be utilised:
    - A practical guide to managing alien plants compiled by the World Wide Fund for Nature (2021)[1]
    - Invasive alien vegetation management manual prepared by The Nature Conservation Corporation (2006)[2]
    - Best Practice Guideline: alien vegetation management prepared by the Cape Conservation Stewardship Association, The Nature Conservation Corporation and Cape Nature[3]

6.1.5 Noise

- The operation of the Solar PV Facility at the Paardevlei site must remain compliant with the provisions of the Western Cape Noise Control Regulations, PN 200 of 2013.
- Note that found to be operating on violation to the said regulations, corrective provisions of Regulation 4(4) and Regulation 13 of the Western Cape Noise Control Regulations will be applied.

7 MONITORING AND REVIEW

7.1 Environmental Auditing

The appointed ECO shall visit the site on a monthly basis and produce a monthly report, outlining any non-compliances and recommending corrective actions.

The DEO shall monitor daily site activities in terms of the CEMPr.

7.2 Corrective Action

The implementation table sets out roles and responsibilities for managing any non-compliance and detailing measures to prevent negative impacts.

Any avoidable non-compliance with the requirements of the EMP shall be considered sufficient grounds for the imposition of a penalty in consultation with the RE. Possible offences, which could result in the issuing of a penalty / fine, include, but are not limited to:

[1] https://wwfafrica.awsassets.panda.org/downloads/a_practical_guide_to_managing_invasive_alien_plants_web.pdf
[2] http://sourcetosea.org.za/preproduction/wp-content/uploads/2015/12/NCC-alien-clearing-manual.pdf
[3] https://www.conservationatwork.co.za/wp-content/uploads/pdf/BPG_Alien_Vegt_Mngmnt.pdf

- Improper management of hydrocarbons / hazardous materials leading to large spills or leaks.
- Improper management and cleaning of ablution facilities where the environment is impacted by spills.
- Insufficient solid waste management (e.g. unauthorised dumping, incorrect disposal, etc).
- Lack of correct topsoil removal, management and storage.
- Insufficient fire control and unauthorised fires.

A list of fines for certain environmental transgressions are attached in **Annexure G**.

Where the Contractor inflicts non-repairable damage upon the environment or fails to comply with the CEMP, he/she shall be liable to pay a penalty fine.

The following penalties that are outlined in **Table 6** are suggested for transgressions.

Table 6: Penalties

ID	Impact	Description
a.	Erosion	A penalty equivalent in value to the cost of rehabilitation.
b.	Oil spills	A penalty equivalent in value to the cost of cleanup.
c.	Damage to indigenous vegetation	A penalty equivalent in value to the cost of restoration.
d.	Damage to sensitive environments/no-go areas	A penalty equivalent in value to the cost of restoration.
e.	Damage to cultural/historical sites	A penalty to a maximum of R 100 000 shall be paid for any damage to any cultural/ historical sites
f.	Damage to trees	A penalty to a maximum of R100 000 shall paid for each tree removed without prior permission, or a maximum of R5 000 for damage to any tree, which is to be retained on site.
g.	Penalties for removing or damaging trees:	
	Girth of trunk (1m above ground level)	Replacement value per tree
	0 – 15 mm	R100.00
	16 – 30 mm	R200.00
	31 – 50 mm	R500.00
	51 – 75 mm	R1 000.00
	76 – 100 mm	R2 500.00
	101 – 150 mm	R5 000.00
	150 – 300 mm	R10 000.00
	Larger than 300 mm	R15 000.00 to R100 000.00

All fines and penalties must be made out to an environmental or conservation organization to be determined in consultation with the CCT.

8 DECOMMISSIONING PHASE

It is not envisaged that the Paardevlei Solar & BESS project (once implemented into the CCT electrical grid) will be decommissioned.

9 CONCLUSION

The EMPr is a living document and should be updated as operations may change on site.

Annexure A: Solar PV Layout

Annexure B: Sensitivity Maps

Annexure C: Water Use Licence

Annexure D: HWC Procedure: Chance Finds of Palaeontological Material – dated June 2016

Annexure E: Environmental Do's and Don'ts

ENVIRONMENTAL MANAGEMENT DO'S AND DON'TS

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

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

Protect animals on the site
Ask your supervisor or Contract's Manager to remove animals found on site

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

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

Work with petrol, oil & diesel in areas marked for this
Report any petrol, oil & diesel leaks or spills
Use a drip tray under vehicles & machinery
Empty drip trays after rain & do not throw this water into a river

Try to avoid producing dust - wet dry ground & soil

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

Use the toilets provided
Report full or leaking toilets

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

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

Always keep to the speed limit
Drivers - check & report leaks
Ensure loads are secure & do not spill

Know all the emergency phone numbers

Fines of between R1000 and R5000
Removal from site
Construction may be stopped

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

Annexure F: Fine Schedule

ID	Description	Rand Value (incl. VAT)
A	Any vehicle being driven, and items of plant or materials being parked or stored outside the demarcated boundaries of the site or on private property.	R 2,000
B	Persons walking outside the demarcated (fenced) boundaries of the site or on private property.	R 500
C	Persistent and un-repaired oil leaks from machinery. The use of inappropriate methods of refuelling such as the use of a funnel rather than a pump	R 3,000
D	Litter on site	R 1,000
E	Deliberate lighting of illegal fires on site	R 5,000
F	The eating of meals on site outside the defined eating area. Individual not making use of the site ablution facilities	R 1,000
G	Dust or excess noise on or emanating from site	R 1,000
H	Any person, vehicle, item of plant, or anything related to the Contractors operations causing a public nuisance	R 2,000
I	Failure to comply with prescriptions regarding method statements	R 2,000
J	Failure to comply with requirements regarding cement and concrete batching	R 3,000

Annexure G: Method Statement

Project Name:			
Method Statement for:			
Method Statement Compiled by:			
Start Date of Works:		**End Date of Works:**	

1. Provide a brief description of <u>what works</u> is to be undertaken

2. Provide a description of the <u>where the works</u> are to be undertaken

3. Provide a detailed description of the process of work, methods and materials to be used

4. Provide a description of when the works will take place (commencement dates and completion date estimates)

Method Statement Declarations

1. ENVIRONMENTAL CONTROL OFFICER

The work described in this Method Statement, if carried out according to the methodology described, appears to be satisfactorily mitigated to prevent avoidable environmental impacts:

_____ _____

Signature Print Name

Date _____

2. CONTRACTOR

I understand the contents of this Method Statement and the scope of the works required of me. I further understand that this Method Statement may be amended on application to other signatories and that the Proponent's Representative/Environmental Control Officer will audit my compliance with the contents of this Method Statement. I understand that this method statement does not absolve me from any of my obligations or responsibilities in terms of the Contract of Construction.

_____ _____

Signature Print Name

Date _____

3. PROPONENT'S REPRESENTATIVE

The works described in this Method Statement are approved.

_____ _____

Signature Print Name

Date _____

Annexure H: Incidents Register – Example of Template

INCIDENT REGISTER – (Project Name)					
Person reporting the incident (name & contact details)	**Short Description of incident**	**Date incident occurred**	**Date incident reported**	**State how the incident was addressed, and date incident was rectified**	**Person Responsible for Rectification**