ENVIRONMENTAL MANAGEMENT PROGRAMME

PROPOSED CONSTRUCTION OF PULIDA BATTERY ENERGY STORAGE SYSTEM (BESS)

Letsemeng Local Municipality, Free State Province

DFFE Ref No.: 14/12/16/3/3/1/2574

EMPr REVISION: v01

PREPARED FOR:

Enel Green Power South Africa (Pty) Ltd

DATED:

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ENVIRONMENTAL MANAGEMENT PROGRAMME

Completed in terms of the National Environmental Management Act, 1998 (Act No.107 of 1998), as amended and the Environmental Impact Assessment Regulations, 2014 (as amended).

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Signature		**Signature**
		
Date		**Date**

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ABBREVIATIONS

BA	Basic Assessment
BAR	Basic Assessment Report
BSP	Biodiversity Sector Plan
CAR	Corrective Action Report
CBA	Critical Biodiversity Area
CEA	Controlled Environment Agriculture
DAFF	Department of Agriculture, Fisheries and Forestry
DEA	Department of Environmental Affairs
DFFE	Department of Forestry, Fisheries and the Environment
DWS	Department of Water Affairs and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EIR	Environmental Impact Report
EMPr	Environmental Management Programme
EO	Environmental Officer
ESA	Ecological Support Area
IDP	Integrated Development Plan
LCA	Life Cycle Assessment
MSDS	Material Safety Data Sheet
NCR	Non-Conformance Report
NEMA	National Environmental Management Act
NFEPA	National Freshwater Ecosystem Priority Area
PM	Project Manager
ROSE	Recycling Oil Saves the Environment
SAHRA	South Africa Heritage Resources Agency
SANBI	South African National Biodiversity Institute
SDC	Safe Disposal Certificate
SDF	Spatial Development Framework
SHE	Safety, Health and Environmental
S&EIR	Scoping and Environmental Impact Report
TBC	To Be Confirmed
WULA	Water Use Licence Application

GLOSSARY OF SELECTED TERMS AND DEFINITIONS

CONTAMINATION	The release/spillage of a substance into an environment where it is not normally found, which is detrimental to that environment, its ecosystems and to humans.
CORRECTIVE (OR REMEDIAL) ACTION	Reactive response required to address an action that is in conflict with the requirements of the Site Documentation. The need for corrective action may be determined through monitoring, audits or management review.
DEVELOPER	Pulida Energy (RF) (Proprietary) Limited is the applicant for the proposed development project.
DOMESTIC WASTE	Means waste, excluding hazardous waste that emanates from premises that are used wholly or mainly for residential, educational, health care, sport or recreation purposes; *(NEM: WA, Act No. 59, 2008).*
ENVIRONMENT	Means the surrounding within which humans exist and that are made up of: (i) The land, water and atmosphere of the earth (ii) Micro-organism, plant and animal life. (iii) Any part or combination of (i) and (ii) and the interrelationships among and between them; and the physical, chemical aesthetical and cultural properties and conditions of the foregoing that influence human health and wellbeing *(NEMA, Act 107 of 1998)*.
ENVIRONMENTAL IMPACT ASSESSMENT (EIA)	Means the systematic process of identifying, assessing and reporting environmental impacts associated with an activity and includes the basic assessment report and/or scoping and environmental impact assessment report (NEMA EIA Regulations GN. R982 of 2014, as amended).
IMPACT	A description of the potential effect or consequence of an aspect of a development on a specified component of the biophysical, social, or economic environment within a defined time and space.
INCIDENT	An undesired event which may result in a significant environmental impact but can be managed through internal response.
MITIGATION	Measures designed to avoid, reduce or remedy the proposed adverse impacts (*DEAT, 1998*).
MONITORING	The repetitive and continued observation, measurement, and evaluation of environmental criteria to follow changes over a period of time and to assess the efficiency of control measures *(DEAT, 1998)*.
POLLUTION	Means any contamination or change in the environment caused by: • Substances • Radioactive or other waves; or • Noise, odours, dust or heat Emitted from any activity, including the storage or treatment of waste or substances, construction and the provision of services, whether engaged in by any person or organ of state, where that change has an adverse effect on human health or wellbeing or on the composition, resilience and productivity of natural or managed ecosystems, or on materials useful to people, or will have such an effect in the future (*NEMA, Act No. 107 of 1998)*.
PROJECT	The proposed construction of a retrofitted battery energy storage system at Pulida Solar Park
WASTE	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 (he 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, and includes waste generated by the mining, medical or other sector, but— (i) a by-product is not considered waste; and (ii) any portion of waste, once re-used, recycled and recovered, ceases to be waste; *(NEM: WA, Act 59 of 2008).*

1 INTRODUCTION

1.1 Background

The developer, Enel Green Power South Africa (Pty) Ltd (**EGP**), is proposing to submit an application for an Environmental Authorisation for the construction of Pulida Battery Energy Storage System (**BESS**) in the proximity of the existing Pulida Solar photovoltaic facility located in Letsemeng Local Municipality in the Free State province. Part of the submission requirements is for the positive Environmental Authorisation (EA).

The general purpose and utilisation of a BESS is to save and store excess electrical output as it is generated, allowing for a timed release of electricity to the grid when the capacity is required and to provide ancillary services to the network. BESS systems therefore provide flexibility in the efficient operation of the electricity grid through decoupling of the energy supply and demand.

NCC Environmental Services (Pty) Ltd (**NCC**) was appointed by **Pulida** to assist with proactive environmental management services for the 'proposed development' (hereafter referred to as the 'project'). This Environmental Management Programme (**EMPr**) was compiled as part of the BAR application process for Environmental Authorisation [**EA**] required by the National Environmental Management Act, 1998 (Act No. 107 of 1998) (**NEMA**), hereafter referred to as 'NEMA' throughout this document. Section 19-20 [BA] of the NEMA EIA Regulations, published in Government Notice No. R. 982 dated 4th December 2014 (as amended), require that as part of the EA application process, an EMPr be prepared and submitted for a decision by the competent authority, the Department of Forestry, Fisheries and the Environment (**DFFE**).

The EIA Regulations should also be read in conjunction with Section 24N of NEMA.

1.2 Scope of EMPr

This EMPr provides environmental guidance to the developer, engineers, agents and contractor(s) for the planning, construction and operational phases of the proposed development activities with regard to their responsibilities in terms of accountable environmental management. This EMPr is to be implemented by the aforementioned parties in the execution of the project in order to ensure environmental compliance on site. The effectiveness of the EMPr is limited by the level of adherence to the conditions set forth in the EMPr. It is further assumed that conformance to the EMPr will be monitored and audited as set out in this EMPr.

1.2.1 EMPr overview

An EMPr indicates the potential environmental impacts that a development activity could have on the biophysical and socio-economic environment and which mitigation and monitoring procedures should be implemented to minimise negative impacts and optimise positive impact. This EMPr provides generic and site-specific environmental management measures related to the project in terms of keeping the overall environmental footprint as small as possible. The EMPr has been compiled to form the basis of a management system to implement on this particular project to regulate and control activities pre-construction [planning and design phase], during construction as well as during the operational phase.

The EMPr is primarily based on the principles of NEMA which bestows a '*Duty of Care*' on those who cause, have caused or may in future cause pollution or degradation of the environment, as per of Section 28(1) of NEMA.

This EMPr is a dynamic document which can be updated as required on a continuous basis to ensure environmental best practice prevails. Any substantive EMPr amendments considered necessary must first be submitted to the Project Manager and ECO for consideration. Final amendments to the EMPr must be submitted to the relevant authority for consideration and ultimate approval.

1.2.2 Purpose of EMPr

This EMPr has been compiled to provide recommendations and guidelines for the implementation of control measures to mitigate against negative environmental impacts, and the associated monitoring thereof, throughout the duration of the proposed development project. The purpose of the EMPr is to ensure that all relevant impacts are considered for the undertaking of environmentally responsible activities and provides both generic and direct specifications for "*good environmental practice*" for application across the lifecycle of the project [planning, design, construction and operational phases].

The EMPr informs the relevant project role-players (developer, engineer, contractor, compliance officer, e.g., ECO and all other staff employed at the site) as to their respective roles and duties in the fulfilment of the

environmental legal requirements during all phases, with particular reference to the prevention and mitigation of anticipated negative environmental impacts. Furthermore, it aims to organise and coordinate the environmental management and mitigation measures with construction and operational activities and pragmatically describe these measures in order to prevent, reduce or otherwise manage the potential negative environmental impacts associated with the project. Where opportunities exist to enhance/optimise any favourable/positive impacts related to the project, these have also been described.

1.2.3 Objectives of EMPr

The objectives are:

a) To ensure compliance with regulatory authority stipulations and guidelines which may be local, provincial, national and/or international
b) To assign roles and responsibilities to parties involved regarding the implementation of this EMPr
c) To verify environmental performance through information on impacts as they occur
d) To outline mitigation measures and environmental specifications which are required to be implemented for all phases of the project in order to minimise the extent of negative environmental impacts, and to otherwise manage environmental impacts associated with the proposed project
e) To detail specific actions deemed necessary to assist in minimising the environmental impact of the project
f) To identify measures that could optimise beneficial/favourable/positive impacts
g) To create management structures that address the concerns and complaints of I&APs with regards to the Project
h) To propose mechanisms for monitoring compliance with the EMPr and reporting thereon
i) To specify time periods within which the measures contemplated in the final EMPr must be implemented, where appropriate.

1.2.4 Structure of EMPr

The EMPr is divided into five phases. Each phase has specific issues and activities related to that period. The impacts are identified and given a brief description in line with the Project phases outlined in Regulation No. 982, Appendix 4, Section 1(d) highlighted below:

a) Planning and Design Phase

This section provides management principles for the planning and design phase of the development prior to the undertaking of any construction activities. The primary environmental objective during this phase is to ensure the best suited environmental option for the proposed development is selected based on the final design (*i.e.* plans, drawings, layouts, surveys, environmental assessments and specialist studies) undertaken for the proposed site footprint.

b) Pre-Construction Phase (includes assessments, approvals, permits, authorisations)

This section will provide guidance on pre-construction activities including authorisation/permit requirements, site establishment; environmental induction and training and awareness; site access and health and safety. Environmental actions, procedures and responsibilities are described. Management principles are outlined, and the developer will be required to follow these guidelines including those conditions derived from the EA, should one be issued by the decision-making authority.

c) Construction Phase (includes contractor appointment and site establishment)

Based on the premise that the proposed development is authorised to proceed; this section provides management principles for the construction phase. Environmental actions, procedures and responsibilities are specified. These specifications should form part of any contractual documentation and the contractor will be required to comply with these specifications to the satisfaction of the developer, Project/Site Manager and ECO.

d) Post-Construction Phase (includes site de-establishment and rehabilitation)

Upon completion of construction and prior to operation of the controlled environmental farm facility, this section provides measures, environmental actions, procedures and responsibilities for site de-establishment by the construction contractor and any rehabilitation requirements. These requirements should also form part of the contractual documentation and the contractor will be required to comply with these measures to the satisfaction of the developer, Project/Site Manager and ECO.

e) Operational Phase

This section of the EMPr includes management principles, best practice, procedures and responsibilities as required for controlling the impact on the environment during operational activities. The aim is to ensure that the infrastructure is operated and maintained according to '*best practice*', in other words, to ensure that the development is maintained and operated in an environmentally sensitive and sustainable manner where operational activities do not result in reasonably avoidable environmental impacts from occurring.

1.3 Author of the EMPr

Appendix 4(1) of the EIA Regulations, 2014, indicates that the EMPr must contain details of the EAP who prepared the document and the relevant expertise of the EAP. The EMPr has been prepared by Nick Gates and Craig Burne of NCC Environmental Services (Pty Ltd (NCC). NCC is a Cape Town based environmental consulting firm with regional offices in Durban and Johannesburg. The company as extensive consulting experience in a variety of private and public sector development and construction projects throughout South Africa. The CV of the author is attached as **Annexure A**.

1.4 Legal requirements

The Constitution of the Republic of South Africa (Act No. 108 of 1996) Section 24 states:

> ***Everyone has the right to an environment that is not harmful to their health or well-being; and to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that prevent pollution and ecological degradation; promote conservation; and secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.***

As such, certain activities associated with development projects may trigger particular environmental legislative requirements, either under the various Duty of Care provisions found in Section 28 of NEMA, some of the Specific Environmental Management Acts, the NEMA Listing Notices or other approvals which are required prior to commencing with the development. Other relevant legislation is provided in **Annexure B.**

1.5 Environmental authorisation

According to section 2, subsections 1, 2 & 3 of **NEMA** [the Act], all Organs of State have to apply certain principles set out in the Act when taking decisions that may significantly affect the environment. The key principles of this Act include that all "actions" approved must be economically, socially and environmentally sustainable and justifiable. It further states that "*environmental management must place people and their needs at the forefront of its concern*" and that their collective interests must be served equitably.

In accordance with NEMA and the relevant EIA Regulations, NCC engaged with DFFE and DWS on behalf of Pulida in order to assess the legal requirements to be met related to the proposed development. It was confirmed that an application for environmental authorisation (EA) and WULA. The works carried out on the project will be undertaken in accordance with the revised NEMA EIA Regulations: GN982 of 4 December 2014.

Project associated activities should be implemented and managed according to the best and current industry practice, as identified in the contractual, project-specific documentation. This EMPr, which forms an integral part of any contractual documents, informs the project role-players as to their duties in the fulfilment of the project objectives, with particular reference to the prevention and mitigation of environmental impacts caused by the project. Where applicable, the content of this EMPr are aligned with the requirements as set out in Section 19(4) of the NEMA EIA Regulations.

The contractor should note that obligations imposed by the approved EMPr are binding in terms of any agreements between the developer [Pulida] and themselves and will therefore be part of the terms of additional conditions and the general conditions of contract that pertain to this development. The contractor shall identify and comply with all South African national and provincial environmental legislation, including associated regulations and all local by-laws relevant to the project. Key legislation currently applicable to the design, construction and implementation phases of the development must be complied with. The list of primary applicable legislation provided below (**Annexure B**) is intended to serve as a guideline only and is not exhaustive.

Table 1: The activity requiring authorisation is referenced below:

Activity No(s):	The relevant **Basic Assessment Activity(ies)** in writing as per **Listing Notice 1** (GN No. R. 983)	Description of the activity
11.	The development of facilities or infrastructure for the transmission and distribution of electricity— **(i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts; or** ~~(ii) inside urban areas or industrial complexes with a capacity of 275 kilovolts or more;~~ excluding the development of bypass infrastructure for the transmission and distribution of electricity where such bypass infrastructure is— (a) temporarily required to allow for maintenance of existing infrastructure; (b) 2 kilometres or shorter in length; (c) within an existing transmission line servitude; and (d) will be removed within 18 months of the commencement of development.	The site is in a rural area and the capacity of the distribution exceeds 33kV. The BESS would be connected to the grid by means of a cable to connect the BESS substation to the existing HV substation or with a loop in loop out to the existing HV line. The capacity of the cable would be 132kV. The connection will be roughly 600m to 700m in length.
12	The development of— ~~(i) dams or weirs, where the dam or weir, including infrastructure and water surface area, exceeds 100 square metres; or~~ **(ii) infrastructure or structures with a physical footprint of 100 square metres or more** where such development occurs— **(a) within a watercourse** ~~(b) in front of a development setback; or~~ **(c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse; —** excluding— (aa) the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour; (bb) where such development activities are related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies;	The construction of the access road and High Voltage (HV) Cabling (underground or overhead) between the BESS and the PV substation has the potential to exceed 100sqm in size within a water course or within 32m of a watercourse. The BESS and substation would not be within a watercourse or within 32m of a watercourse

	(cc) activities listed in activity 14 in Listing Notice 2 of 2014 or activity 14 in Listing Notice 3 of 2014, in which case that activity applies; (dd) where such development occurs within an urban area; (ee) where such development occurs within existing roads, road reserves or railway line reserves; or (ff) the development of temporary infrastructure or structures where such infrastructure or structures will be removed within 6 weeks of the commencement of the development and where indigenous vegetation will not be cleared.	
14	The development and related operation of facilities or infrastructure, for the storage, or for the storage and handling, of a dangerous good, where such storage occurs in containers with a combined capacity of 80 cubic metres or more but not exceeding 500 cubic metres	Depending on the technology to be considered upon implementation, (specifically for Flow Battery and depending on the battery supplier), there may be instances where a battery is not fully assembled and the electrolyte (or substances making up such electrolyte) intended for such battery, may potentially be stored on site, in a container (e.g. tanks). In this instance, where the electrolyte, or the substances making up the electrolyte, are stored in a container, such facility or infrastructure will indeed be regarded as a facility or infrastructure for the storage, or storage and handling of a dangerous good. The total amount of hazardous materials stored on site, as a result of this development, will not exceed 500 m^3.
19	The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse; but excluding where such infilling, depositing, dredging, excavation, removal or moving— (a) will occur behind a development setback; (b) is for maintenance purposes undertaken in accordance with a maintenance management plan; (c) falls within the ambit of activity 21 in this Notice, in which case that activity applies; (d) occurs within existing ports or harbours that will not increase the development footprint of the port or harbour; or (e) where such development is related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies.	The access road and powerlines (underground or overhead) between the BESS and the PV substation will potentially impact on an identified watercourse. They may excavate or infill more than 10 cubic metres of material from within a water course or within 32m of a watercourse. The **BESS** and **substation** will not directly impact upon any watercourse

24	**The development of a road—** ~~(i) for which an environmental authorisation was obtained for the route determination in terms of activity 5 in Government Notice 387 of 2006 or activity 18 in Government Notice 545 of 2010; or~~ **(ii) with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres;** but excluding a road— (a) which is identified and included in activity 27 in Listing Notice 2 of 2014; (b) where the entire road falls within an urban area; or (c) which is 1 kilometre or shorter.	The access road leading up to the site has the potential to be wider than 8m in width. The access road would not have any road reserve.
27	The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation **except** where such clearance of indigenous vegetation is required for— (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan.	Although the site has transformed grassland due to anthropogenic activities, approximately 3-4 ha of indigenous vegetation would be cleared to accommodate the development of the BESS and associated facilities (This includes the laydown areas, substation, access road and MV and HV cabling to connect the BESS to the HV Substation or the loop in loop out to the exiting HV line) more than 1 hectare but up to 4ha of indigenous vegetation would need to be cleared for the proposed development.
28	Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture, game farming, equestrian purposes or afforestation on or after 01 April 1998 and where such development: ~~(i) will occur inside an urban area, where the total land to be developed is bigger than 5 hectares; or~~ **(ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare;** excluding where such land has already been developed for residential, mixed, retail, commercial, industrial or institutional purposes.	The BESS and associated infrastructure represent an industrial development outside of an urban area, and will be in excess of 1 ha. The site proposed for the BESS is also currently utilised for agricultural purposes. The Applicant would apply for the necessary rezoning certificate

Table 2: Listed activity in terms of GNR 985 Listing Notice 3 of 2014 (amended)

Activity No(s):	The relevant **Basic Assessment Activity (ies)** in writing as per **Listing Notice 3** (GN No. R. 985)	Description of the activity
12	The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan. **b. Free State** ~~i. Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004;~~ ~~ii. Within critical biodiversity areas identified in bioregional plans;~~ ~~iii. On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning; or~~ **iv. Areas within a watercourse or wetland; or within 100 metres from the edge of a watercourse or wetland.**	The construction of the access road and High Voltage (HV) Cabling (underground or overhead) or the loop in loop out to the existing HV line would result in the clearance indigenous vegetation within an identified watercourse.
14	The development of— ~~(i) dams or weirs, where the dam or weir, including infrastructure and water surface area exceeds 10 square metres; or~~ **(ii) infrastructure or structures with a physical footprint of 10 square metres or more** where such development occurs— **(a) within a watercourse** ~~(b) in front of a development setback; or~~ ~~(c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse; excluding the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour~~. **b. Free State** **i. Outside urban areas:** ~~(aa) A protected area identified in terms of NEMPAA, excluding conservancies~~	The construction of the access road and High Voltage (HV) Cabling (underground or overhead) between the BESS and the HV substation or the loop in loop out to the existing HV line would exceed 10sqm in size and be located within an identified watercourse. The BESS and substation would not directly impact upon any watercourse

	~~(bb) National Protected Area Expansion Strategy Focus areas~~ ~~(cc) World Heritage Sites~~ ~~(dd) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority~~ ~~(ee) Sites or areas identified in terms of an international convention~~ **(ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans** ~~(gg) Core areas in biosphere reserves; or~~ ~~(hh) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve; or~~ ~~ii. Inside urban areas:~~ ~~(aa) Areas zoned for use as public open space; or~~ ~~(bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority, zoned for a conservation purpose.~~	

2 PRIMARY LEGISLATION

Box 1: Primary environmental legislation, municipal by-laws and strategies, policies, and plans.

National Legislation and Regulations

- **The Constitution** of the Republic of South Africa (Act No. 108 of 1996)
- Environment **Conservation** Act (Act No. 73 of 1989)
- **National Environmental Management** Act (Act No. 107 of 1998) (as amended)
- NEMA **EIA Regulations**, 2014 (as amended)
- National **Road Traffic** Act (Act No. 93 of 1996)
- National **Road Traffic** Regulations 2000 (as amended)
- National Environmental Management: **Waste Management** Act (Act No. 59 of 2008)
- National Environmental Management: **Air Quality** Act (Act No. 39 of 2004)
- National **Water** Act (Act No. 36 of 1998)
- **Water Services** Act (Act No. 108 1997)
- **Hazardous Substances** Act (Act No. 15 of 1973)
- **Mineral and Petroleum** Resources Development Act (Act No. 28 of 2002)
- National **Forest** Act (Act No. 84 of 1998)
- National **Veld and Forest Fire** Act of 1998 (Act No. 101 of 1998)
- National Environmental Management: **Protected Areas** Act (Act No. 57 of 2003)
- **Mountain** Catchment Areas Act (Act No. 63 of 1970)
- National Environmental Management: **Biodiversity Act** (Act No. 10 of 2004)
- **Alien** and **Invasive** Species Regulations, 2014
- **Animals Protection** Act of 1962 (Act No. 71 of 1962)
- **Agricultural Pests** Act of 1983 (Act No. 36 of 1983)
- Conservation of **Agricultural** Resources Act (Act No. 43 of 1983)
- National **Heritage** Resources Act (Act No. 25 of 1999)
- World **Heritage** Convention Act, 1999
- National **Health** Act (Act No. 61 of 2003)
- **Health** Act (Act No. 63 of 1977)
- Occupational **Health and Safety** Act (Act No. 85 of 1993)
- National Dust Control Regulations, 2013
- **Noise** Control Regulations GN R 154 in GG No. 13717 of 10 January 1992 (published in terms of Section 25 of the Environment Conservation Act 73 of 1989)
- **Hazardous** Substances Act (Act No. 15 of 1973)
- **Fertilizers**, Farm Feeds, Agricultural Remedies and Stock Remedies Act (Act No. 36 of 1947)

Other Documentation

- The White Paper on the Energy Policy of the Republic of South Africa (December 1998)
- The White Paper on Renewable Energy (November 2003)
- Integrated Resources Plan 2010-2030 (IRP 2010)
- Letsemeng Local Municipality Integrated Development Plan 2021/2022
- Xhariep District Municipality Integrated Development Plan 2021/2022
- National Biodiversity Assessment (NBA) & National Vegetation Map
- National Freshwater Ecosystem Priority Area (NEFPA) Assessment

3 PROJECT DESCRIPTION

The proposed BESS will be housed inside containers or similar structures with a total footprint of up to 4ha in extent. Both Lithium-ion and Redox-flow technology are being considered for the project, depending on which is most feasible at the time of implementation.

Associated infrastructure includes:

i. A Substation with a maximum height of - HV busbar up to 10 m max and an HV Building up to 4 m max.
ii. Access road to the BESS (6m wide road surface with side ditch drainage on each side of the road) branching off the existing roads, and internal roads (up to 8m wide) within the footprint of the BESS, as needed. The length of the road will not exceed 700m.
iii. MV Cabling (underground or overhead) between the BESS and the HV/MV BESS substation.
iv. HV Cabling (underground or overhead) between the HV/MV BESS substation and the existing HV substation or for loop in and loop out to the existing HV connection line.
v. Fencing around the BESS and the substation for increased security measures.
vi. Temporary laydown area within the 4ha footprint of the BESS.
vii. Possible firebreak around the BESS facility which is to be located within the 4ha BESS footprint.

Two grid connection options have been explored, option A (connection from the BESS Substation to the existing HV substation) and option B (connection from the BESS Substation to the loop in and loop out to the existing HV connection line).

3.1 Site Location

The proposed site is located on the Remainder of the Farm Klipdrift 20, Jacobsdal Registration Division, 2256.1868 hectares in extent (Letsemeng Local Municipality, Xhariep District Municipality, Free State Province) for the establishment of a retrofitted BESS to associated to the existing solar energy facility with associated infrastructure and structures.

The proposed project is located on the same property to the Pulida Solar Park a photovoltaic (PV) facility with a maximum generating capacity of up to 75 MW.

The footprint (fenced area) of the Solar Park development is up to 200 hectares on an overall area measuring 220 hectares (lease portion), within the Remainder Portion of the Farm Klipdrift 20.

The entire facility (BESS, Substation and other infrastructure) is envisaged to be 4ha in size and is located directly adjacent to the existing facility as illustrated in Figure 9.

Table 3: Property Details

Property Details		
GPS co-ordinates	29° 2'15.12"S	24°55'31.14"E
District Municipality	Xhariep District Municipality	
Local Municipality	Letsemeng Local Municipality	
Ward	7 (41601007)	
SG	F01800000000002000000	

Table 4: GPS positions of BESS Facility (Option A Substation-to-Substation Overhead line)

Activity – BESS Facility		
Point	**Latitude (S)**	**Longitude (E)**
A	29° 2'13.13"S	24°55'24.26"E
B	29° 2'13.16"S	24°55'33.29"E
C	29° 2'16.64"S	24°55'33.30"E
D	29° 2'16.66"S	24°55'24.35"E

Table 5: GPS positions of substation (Option A Substation-to-Substation Overhead line)

Activity – BESS Substation		
Point	**Latitude (S)**	**Longitude (E)**
A	29° 2'13.21"S	24°55'33.88"E
B	29° 2'13.25"S	24°55'35.97"E
C	29° 2'14.74"S	24°55'35.95"E
D	29° 2'14.70"S	24°55'33.86"E

Table 6: GPS positions of BESS Facility (Option B: Loop In & Loop Out Overhead line)

Activity – BESS Facility		
Point	**Latitude (S)**	**Longitude (E)**
A	29° 2'13.29"S	24°55'24.21"E
B	29° 2'13.22"S	24°55'31.91"E
C	29° 2'14.88"S	24°55'31.99"E
D	29° 2'14.83"S	24°55'35.05"E
E	29° 2'16.51"S	24°55'35.02"E
F	29° 2'16.51"S	24°55'24.26"E

Table 7: GPS positions of substation (Option B: Loop In & Loop Out Overhead line)

Activity – BESS Substation		
Point	**Latitude (S)**	**Longitude (E)**
A	29° 2'13.22"S	24°55'31.94"E
B	29° 2'13.19"S	24°55'36.04"E
C	29° 2'14.74"S	24°55'36.01"E
D	29° 2'14.76"S	24°55'32.02"E

Table 8: GPS positions linear structures – Access Road

Activity – Access Road		
Point	**Latitude (S)**	**Longitude (E)**
Start	29° 2'19.13"S	24°56'1.72"E
Middle	29° 2'16.93"S	24°55'49.80"E
Finish	29° 2'16.35"S	24°55'35.60"

Table 9: GPS positions linear structures – Overhead Lines (Option A: Substation to Substation)

Activity – Overhead Lines		
Point	**Latitude (S)**	**Longitude (E)**
Start	29° 2’18.86”S	24°55’59.58”E
Middle	29° 2’15.01”S	24°55’49.81”E
Finish	29° 2’14.19”S	24°55’35.99"E

Table 10: GPS positions linear structures – Overhead Lines (Option B: Loop In & Loop Out)

Activity –Loop In & Loop Out Overhead Lines		
Point	**Latitude (S)**	**Longitude (E)**
Start (BESS Substation)	29° 2'13.83"S	24°55'36.05"
Middle	29° 2'13.73"S	24°55'48.51"E
Finish (Existing Line)	29° 2'13.70"S	24°56'1.10"E

Co-ordinates provided above are for that of the preferred alternative location.

Refer to Appendix C for Detailed Site Development plans.

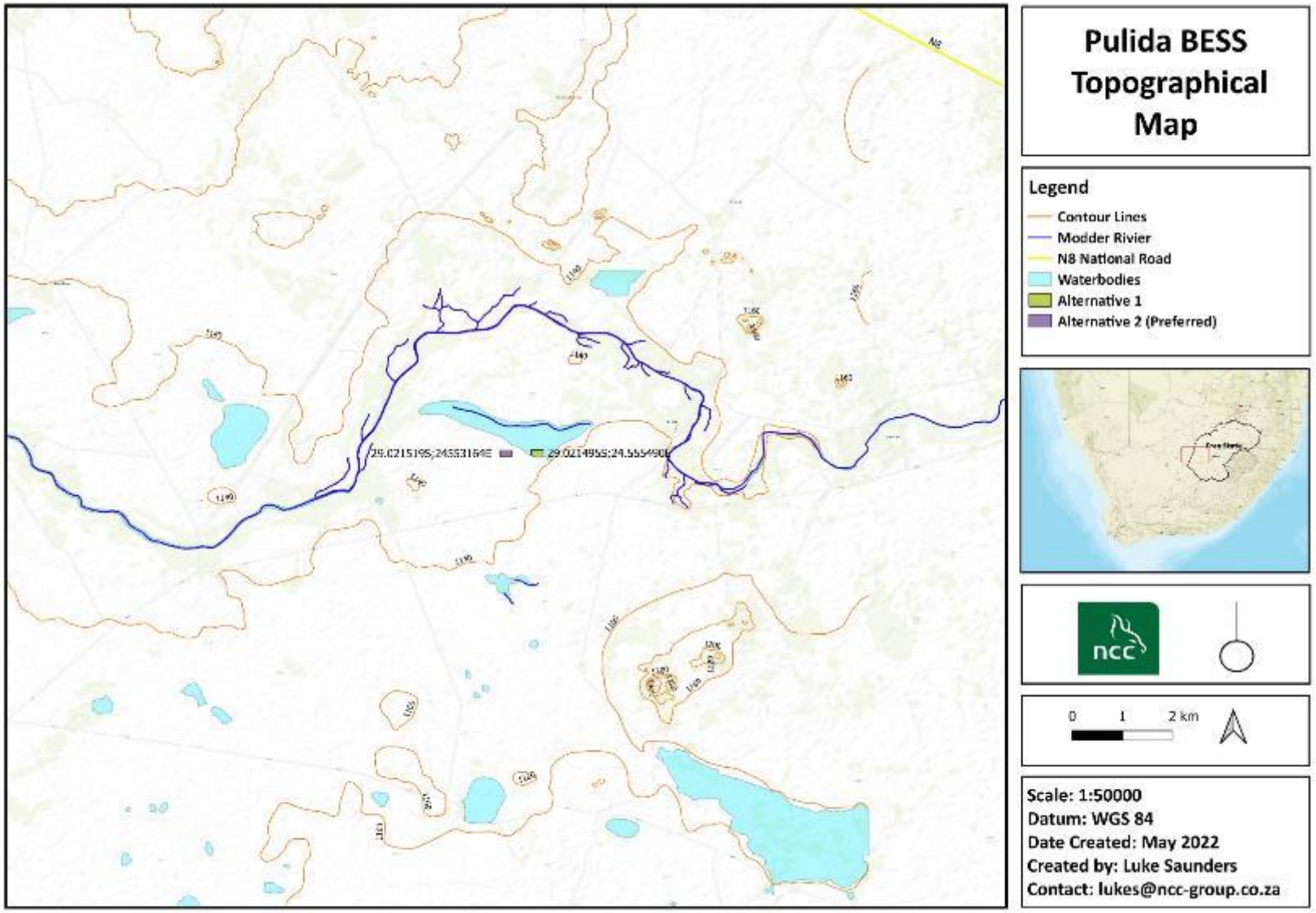

Figure 1: Site Locality Map (Overall project view – relevant section to the north)

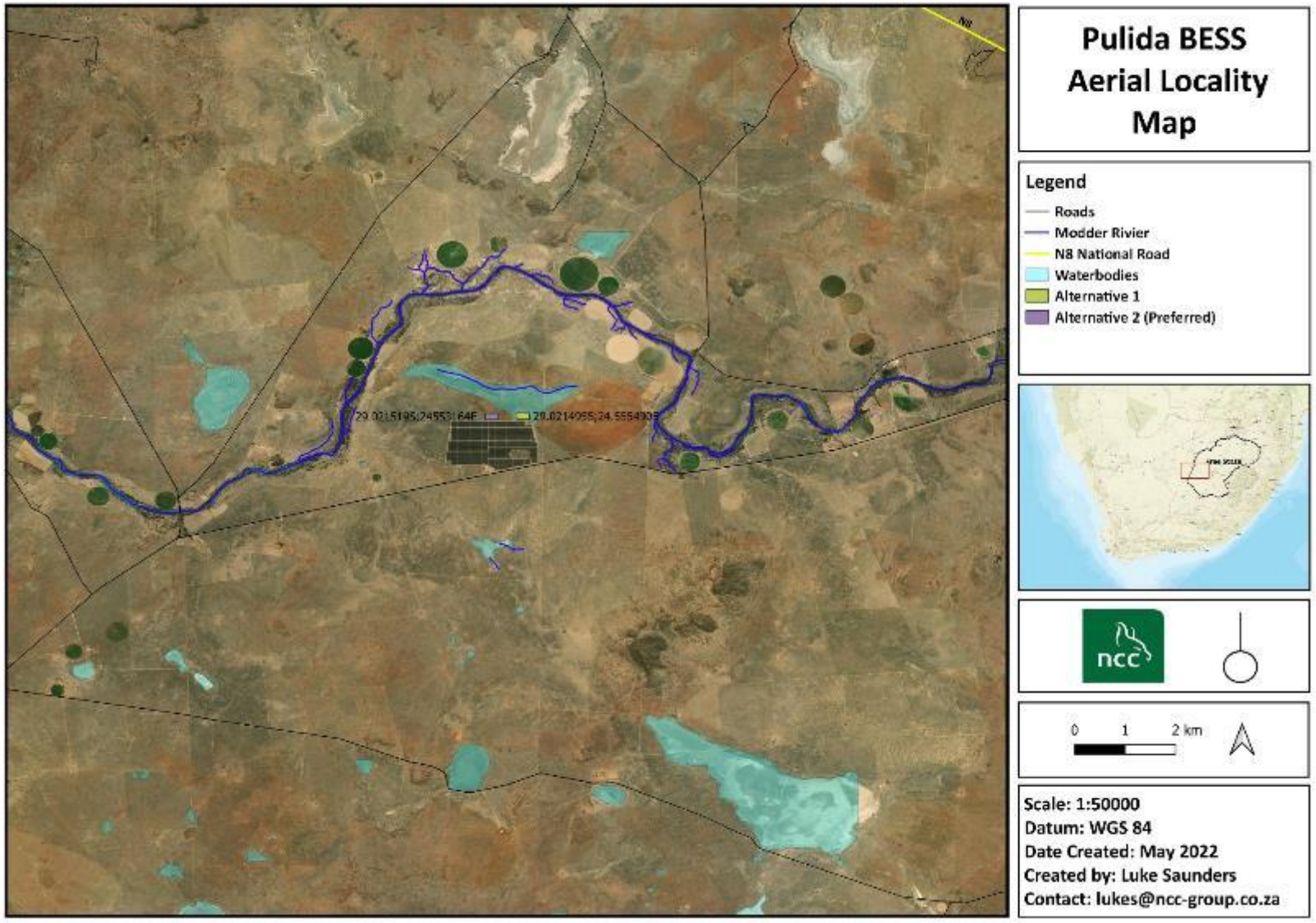

Figure 2: Site Locality Map (Aerial Photograph)

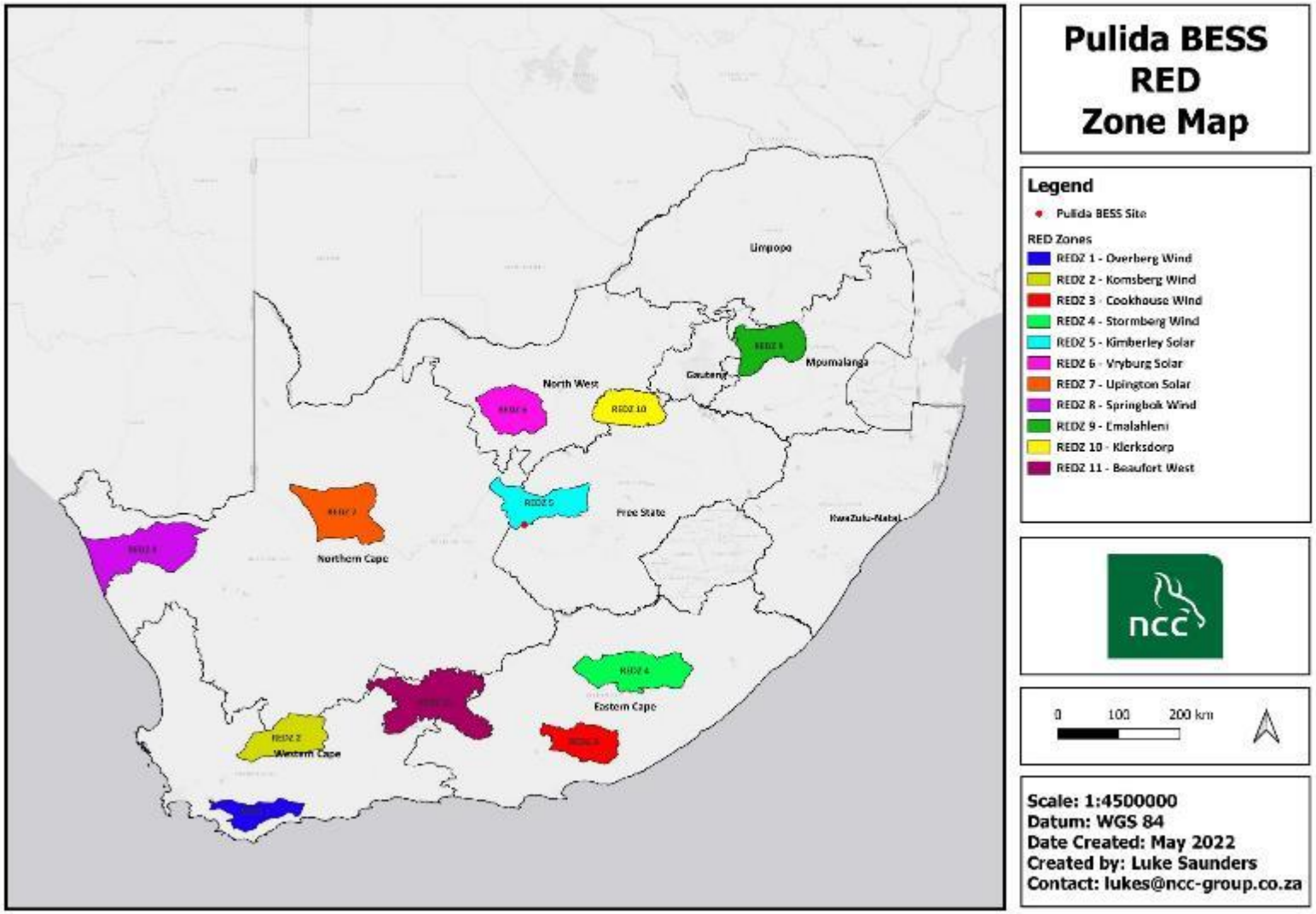

Figure 3: Renewable Energy Development Zones

3.2 Site sensitivities

The proposed development footprint in relation to environmental sensitivities is illustrated in **Figure 2**.

The property occurs within a region classified as both '*Ecological Support Area 1*' and '*Ecological Support Area 2' (ESA2*) within the Northern Upper Karoo, a part of the broader Upper Karoo Bioregion. The site does not encroach or overlap with any Critical Biodiversity Areas (CBAs). The DEA National Screening Tool was also utilised to generate a basic map showing existing infrastructure and access to and around the site and whether an Industrial Development Zone (IDZ), Environmental Management Framework (EMF) or bio-regional plan applies to the specific area.

The study area has been influenced by anthropogenic activities ranging from transformation of grasslands and alien infestation, overgrazing, and hardening of surfaces.

The proposed development footprint in relation to environmental sensitivities is illustrated in **Figure 2**.

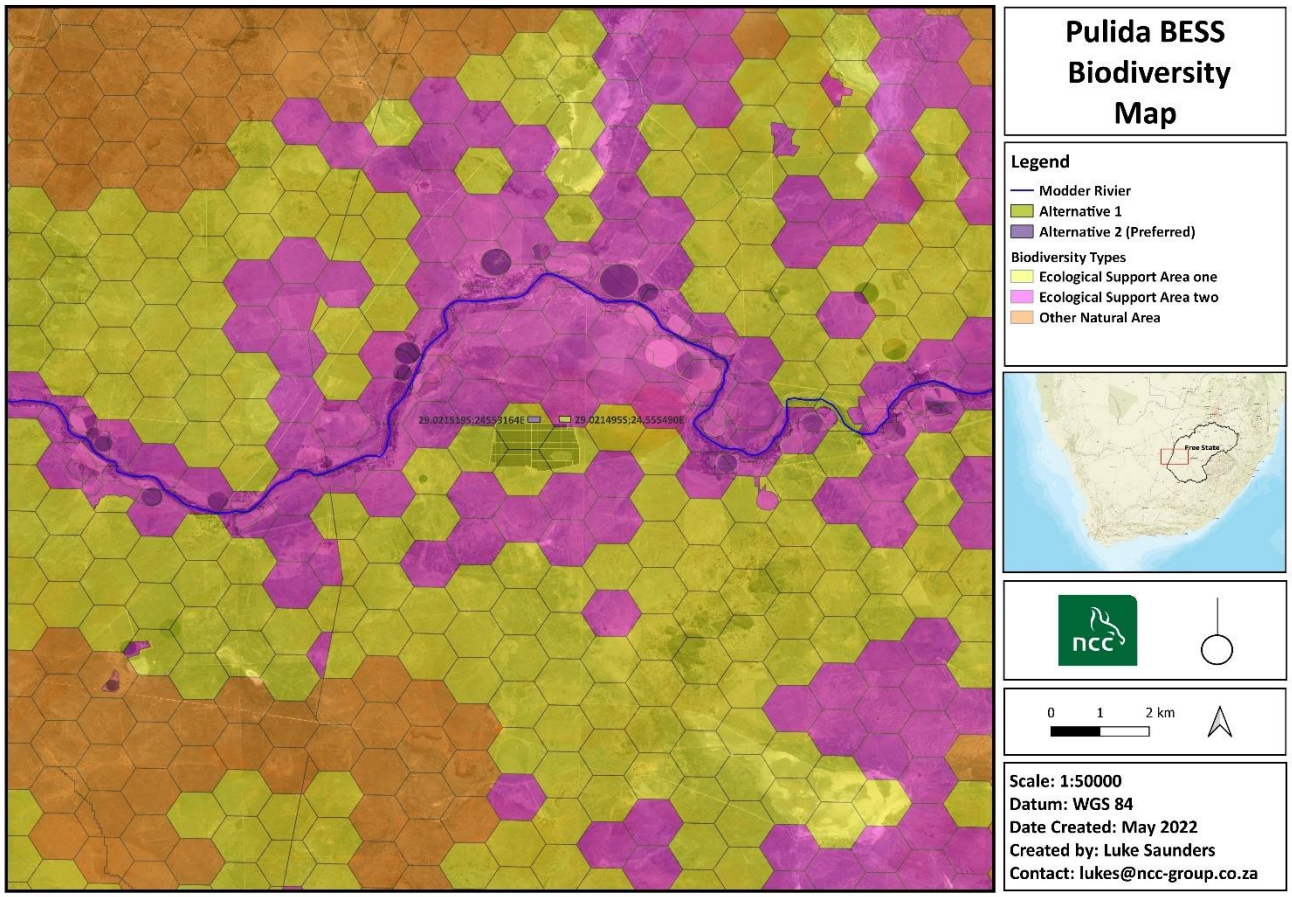

Figure 4: Local proximity of site footprint to environmentally sensitive areas

In terms of freshwater resources, the proposed BESS falls within the Orange Water Management Area (6) based on the 2012 Water Management Areas by the Department of Water and Sanitation and is represented by quaternary catchment C52L. The Modde Rivier runs to the West (2.6km), North (2.7km) and East (3.4km) of the facility. A dry watercourse/pan is located to the north of the proposed BESS site. The datasets reflect the feature and label it a 'depression wetland' which is based on the National Wetland Map Layer version 5 (NWM5).

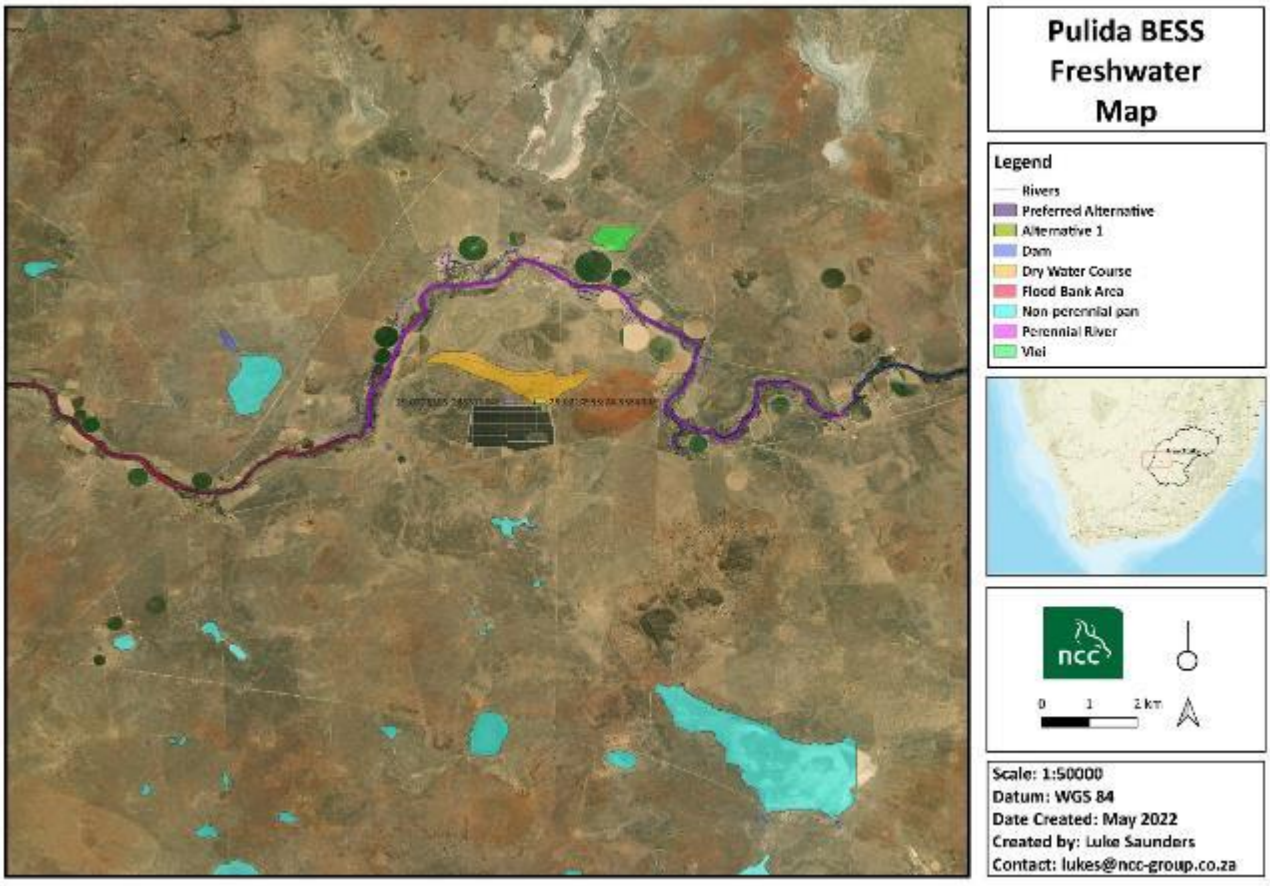

Figure 5: non-perennial watercourse and NFEPA wetland.

3.3 Overview of BESS System

The proposed BESS will be housed inside containers or similar structures with a total footprint of up to 4ha in extent. It will be located adjacent to the existing Pulida Solar Facility.

Both Lithium-ion and Redox-flow technology are being considered for the project, depending on which is most feasible at the time of implementation.

Lithium Ion

Li-ion batteries get their name from the transfer of lithium ions between the electrodes, both when energy is injected for storage purposes and when it is extracted. Within the lithium family there are a variety of different chemistries and designs from numerous suppliers.

Instead of metallic lithium, Li-ion batteries use lithiated metal oxides as the cathode, and carbon typically serves as the anode. Unlike other batteries with electrodes that change by charging and discharging, Li-ion batteries offer better efficiency because the ion movements leave electrode structures intact.

Lithium-ion-based energy storage systems may have cycle durations up to 8 hours. The expected lifetime is related to the cycling Depth of Discharge (DoD). Li-ion batteries' lives are generally limited to less than 80% DoD to ensure an adequate life.

The modularity of the Li-ion cells allows them to be constructed as modules and scaled. Battery packs can then be combined with inverters and controls systems and packaged into BESS at manufacturing facilities. When packaged into standard shipping container sizes, shipping the BESS around the world via truck, rail, or ship is greatly facilitated. Containerized BESS can be sited on pads or simple foundations and electrically connected to switchgear. Containerization significantly reduced the costs for local labour and on-site construction.

Modularized and packaged systems offer ease of system removal from site for disposal at end of life. Site contamination is unlikely, and site restoration would include infrastructure removal and revegetation. The materials used in Li-ion batteries are typically considered non-hazardous waste. The metals in the system can be recycled, but they do not represent a high salvage value.

Vanadium Redox Flow (VRF)

The VRF is based on redox reactions of different ionic forms of vanadium. During battery charge, V3+ ions are converted to V2+ ions at the negative electrode through the acceptance of electrons. Meanwhile, at the positive electrode, V4+ ions are converted to V5+ ions through the release of electrons. Both of these reactions absorb the electrical energy put into the system and store it chemically. During discharge, the reactions run in the opposite direction, resulting in the release of the chemical energy as electrical energy.

Both electrolytes in the VRF are composed of vanadium ions in an aqueous sulphuric acid solution at very low pH. The acidity of the sulphuric acid is comparable to that of the electrolyte found in lead-acid batteries, with a pH of between 0.1 and 0.5.

The electrodes used in VRF are composed of high-surface area carbon materials. The membrane physically separates the two vanadium-based electrolyte solutions, preventing self-discharge while allowing for the flow of ions to complete the circuit. The vanadium electrolytes are stored in separate large electrolyte tanks outside the cell stack.

The electrolyte tanks and associated pipes, valves etc. must be composed of materials that are resistant to corrosion in the very low pH environment. The cell stack is generally environmentally benign. The only material in the stack that might be considered toxic is the ion exchange membrane, which is composed of highly acidic (or alkaline) material.

The VRF is the most technically mature of the flow-type battery chemistries. The first operational VRF was successfully demonstrated in the late 1980s.

The VRF offers a relatively high cell voltage, which is favourable for higher power and energy density Cross-transport of vanadium ions across the membrane is also reported as a challenge. These membranes can be vulnerable to fouling, wherein vanadium ions become irreversibly trapped in the membrane and increase resistive losses in the cell.

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3.4 Construction Activities

The development project will, during the construction phase, include the following activities:

a) Establishing and operating a contractor's site camp incorporating offices, car ports, storage areas, workshops, laboratories, ablution facilities, services, and access.
b) Procurement and transferring materials, plant, and equipment from commercial sources to and within the site's construction footprint.
c) Receiving and storing construction and building materials.
d) Storing construction waste and rubble for collection and disposal.
e) Site preparation, including vegetation clearance and removal of existing structures.
f) Earthworks, stockpiling and spoiling of materials, including any gravel, soil, rocks, and boulders.
g) Excavation of trenches for the installation/connection of water, wastewater, and electrical services.
h) Construction of new structures, installation of services and internal infrastructure.
i) Site rehabilitation activities.

3.5 Operation Activities

The functioning and operation of the BESS facility farm is expected to be long-term and fully functional once construction is complete. Operational infrastructure and activities will include:

- Operational Offices
- Eating area, locker rooms and ablution facility
- Storage Area
- Access road and parking

3.6 Decommissioning and rehabilitation

Pulida plans to maintain the BESS in the long-term. Replacement of battery components may be required however no decommissioning of the system as a whole is planned in the foreseeable future. Maintenance management measures (e.g., the return to supplier clause) that cover the disposal of certain components such as have been included in the EMPr under the operational phase.

The typical life expectancy for the BESS system is between 15 to 20 years, all depending on the technology used, operations and application of the system and maintenance regimes applied etc. The system is modular, which allows premature equipment failures to be counteracted by replacing the specific sections, without major impact on the holistic system.

As with the other equipment, the decommissioning process for BESS involves dismantling and removing the equipment and waste from the site in compliance with applicable federal and local rules governing its safe transport and disposition.

The actual scope of decommissioning shall allow for the energy storage system to be safely de-energized, disassembled, readied for shipment or storage, and removed from the premises.

Once a used battery is removed from service and diverted toward end-of-life management, it will be disposed as per the most relevant measures as identified at the time.

These can include the following.

- Recordkeeping
- Labelling
- Specified storage methods that keep material out of the environment
- Outline approved recycling or disposal pathways and structures

The balance of plant represents a significant quantity of materials, including:

- Concrete pads or foundations
- steel enclosures or containers
- cabling
- array of electronics that are part of the entire energy storage system package (conversion units)

Concrete and steel are readily recyclable, and many enclosures can be reused. Inverters, control systems, and other electronic equipment share many of the challenges of e-waste more broadly, but useful materials often can be recovered.

The cost and environmental implications of BESS end of life decommissioning are considerable. However, especially considering the growth of the battery energy recycling market, these costs and environmental outcomes will evolve, and these changes will arise from individual companies adopting best practices, industry-wide initiatives to support sustainable market expansion, and changes to policies and regulations at the federal, state and local levels. Improvements in costs and environmental outcomes will apply as the market evolves to cater for these technologies – reuse and safe disposal at a fraction of the cost.

The descriptions of the dismantling activities are indicated in the table below. Their cost is derived by accounting for dismantling of equipment on site, transport to Battery OEM or to the disposal / recycling facility, dedicated recycling cost. There is a possible salvage cost of the batteries since they can be sold as second-hand systems, or the batteries carry some recycle value to be reused.

Key Equipment	Description
Power Conversion Units	Removal and demolishing of Inverter Modules, Inverter Step-Up transformers, Switchgear, Canopies and Enclosures, Rebar of Concrete Foundations
Cable Reticulation System	Removal and Demolish of Cable Trays, Racks, Ladders, Supports, Conduit etc.
Low Voltage Cabling	Removal of DC, LV and Communication Cabling
Medium Voltage Cabling	Partial removal of MV Cabling - above ground and up to a level
Cable Trench Rehabilitation	Opening and Closing of Cable Trenches - Rehabilitating the Route
Batteries and Container	Removal of Batteries and Containers, Rebar of Concrete Foundations
Transport to Recycling Facility	Current batteries to be transported back to manufacturer
Recycling of Lithium-Ion Batteries	Depending on recycling plant (cost of recycling and salvaging could be included)
Storm Water Management System	Removal and Demolish of Storm water Pipes, Culverts, Headwalls etc
Fencing	Removal and Demolish of Plant Perimeter Fence
Topsoil Strip	Strip and Store of Topsoil from Formed areas now impacted by Decommissioning
Import and Replace Topsoil	Import Topsoil from Commercial Sources

4 POTENTIAL ENVIRONMENTAL IMPACTS

The construction activities associated with the Project and the broad manner in which these may impact on the biophysical and human environment have been summarised in the BAR.

In summary a range of potential impacts that may be expected to occur or result from the proposed development either positive [+ve], negative [-ve] or neutral [0], include:

Potential Impacts	Status
Soil compaction / erosion / pollution	[-ve]
Pollution of surface and/or groundwater	[-ve]
Damage to freshwater resources / watercourses	[-ve]
Loss of terrestrial biodiversity	[-ve]
Emergence and establishment of invasive alien vegetation and noxious weeds	[-ve]
Landscape change and visual/aesthetic impacts	[-ve] [+ve], or [0];
Socio-economic impacts	[+ve]
Cultural, historical, archaeological and/or palaeontological impacts	[-ve] or [0];

It is expected that the significance of any negative impacts on the surrounding biophysical and human environment associated with the proposed development will be largely reduced provided this EMPr is strictly adhered to.

Implementation of the Environmental Specifications (**ES**) described in Section 6 of this EMPr aim to avoid, reduce and minimise negative/adverse impacts accordingly. This will require open communication and a collaborative effort between the developer/EA holder, all contractors and any potential end-user developers/clients if they are ultimately different from the primary developer/EA holder. This will have particular relevance with regard to sensitive areas on the site footprint and water and waste management activities during both construction and operations. Good environmental compliance can be enhanced through effective management and maintenance planning, as supported by monitoring and auditing programmes.

The Pulida BESS facility, once operational, would have opportunities which include:

- Reduction in carbon emissions in the country's power generation infrastructure
- Unlocking constrained networks (Reduction in loading/ congestion of upstream High Voltage networks)
- Reducing voltage drops and improve quality of supply
- Deferment or replacement of future capital expansion projects
- Supports mini grids in areas with limited access to bulk power; and
- Peak load reduction - 4 hours of battery storage increases dispatch time (thereby extending baseload and offset carbon emissions).

Refer to **Appendix C: Maps** for Opportunities and Constraints map.

5 IMPLEMENTATION, MONITORING AND REVIEW

5.1 Roles and Responsibilities

5.1.1 Proponent

Enel Green Power RSA (Pty) Ltd will be the project proponent for all components of the work related to the project. The Applicant is therefore accountable for ensuring compliance with the EMPr and all legal requirements related to the project. The proponent is also responsible for the appointment and management of the rest of the project team.

5.1.2 Competent Authority

The authorities or regulatory bodies (including various local authorities and provincial government) will be responsible for the timely processing and issuing of necessary permits or approvals if required for the proposed activities. The authorities may conduct inspections to audit compliance to any permits and conditions thereof. In such cases, the developer and contractors will need to communicate and collaborate with the authorities to ensure compliance.

5.1.3 Project Manager / Project Engineer

The Project Manager (PM) will firstly regulate, control and manage activities associated with the project, and secondly monitor and minimise project associated impacts on the environment by overseeing the implementation of the EMPr. The PM will ultimately be responsible for implementing or conforming to the environmental management measures by any person acting on their behalf, including but not limited to contractors, sub-contractors or service providers associated with the project. The PM will arrange for a post-construction meeting to discuss any issues that need immediate corrective or remedial actions, or to ensure preventative actions are implemented to improve the management of the project.

Additionally, they act as the agent of the Proponent on matters relating to the environment and compliance of the EMPr. They will receive reports from the ECO and reporting to the Proponent, approving the contractors method statements, ensuring that the contractor is knowledgeable of the EMPr and its requirements and responsibilities

5.1.4 Contractor Representative

The Contractor shall appoint an Environmental Officer (EO) representative that is answerable to the developer for effective implementation and monitoring of the EMPr specifications. The EO shall compile method statements for proposed activities and submit these to the Project Engineer and ECO for approval, develop and maintain a daily on-site monitoring system to comply with the EMPr, implement environmental training and awareness, report and maintain a record of incidents and public complaints, implement appropriate corrective

and preventative measures, maintain all on-site environmental records including waste disposal records and ensure internal auditing of the EMPr.

Communicating with the PM, ECO and DFFE where relevant, providing environmental awareness and training/induction etc to all staff, ensuring sub-contractors and suppliers are aware of the site conditions and applicable sections of the EMPr, addressing the findings of the ECO inspections, and providing an Environmental Incident Report File and a Complaints Register

5.1.5 Environmental Control Officer

A suitably qualified independent ECO (with a National Diploma/Degree in Natural Science or an equivalent qualification) shall be appointed by the developer. The ECO shall have adequate environmental knowledge to understand the detailed environmental issues associated with the project and is to be well-versed in the contents of the EMPr and any of the associated reports. The ECO will ensure that environmental mitigation measures are implemented through collaboration with the PM and compile regular environmental compliance reports and/or Audits as specified in the EA. The aim of ECO compliance monitoring will be to record the project's conformance with the EA and EMPr. Compliance reports will be made available to all project-role-players, including the authorities, and any other stakeholders that may request such. A post-construction audit report must be undertaken by the ECO once all construction activities and any required rehabilitation is complete and made available to all project-role-players, relevant authorities, and stakeholders. It must be noted that the responsibility of the ECO on the project is to monitor EMPr compliance during construction and provide advice on the implementation of the EMPr as and when needed, and not to implement compliance. External environmental compliance monitoring during the operational phase, whether by an independent ECO, statutory body or other independent [third party] organisation, should continue on a frequency as agreed to between the authorities and developer.

5.1.6 Independent Environmental Auditor

In accordance with the NEMA: EIA Regulations the holder of an EA must:

For the period during which the environmental authorisation and EMPr, and where applicable the closure plan, remain valid—

(a) Ensure that the compliance with the conditions of the environmental authorisation and the EMPr, and where applicable the closure plan, is audited; and

(b) Submit an environmental audit report to the relevant competent authority.

(c) Be prepared by an independent person with the relevant environmental auditing expertise; and

(d) Conform to requires in under Regulation 34 of NEMA: EIA Regs

The role of the independent ECO and independent External Auditor are separate and must be kept as such.

5.2 Monitoring

A monitoring programme will be implemented for the duration of the Project. This programme will include:

a) A once-off monitoring inspection by the independent ECO prior to site establishment by the contractor. The establishment of a baseline by taking selective, point-based photographs of identified environmental aspects and potential impact sites, should be done prior to Project commencement. The ECO shall retain the *pre-construction* photographic record, including any pre-existing damaged areas inside and outside the site footprint (construction area).

b) Daily and weekly monitoring by the construction contractor during the construction phase as per the contract when the site is active.

c) A register of all complaints received must be maintained on site by the contractor. All complaints / claims shall be handled immediately to ensure timeous rectification / compensation by the responsible party and should be directed to the PM and independent ECO for review and appraisal.

d) Monthly compliance monitoring, auditing and/or reporting by the ECO during the construction phase, focusing on EA and EMPr compliance, or at more frequent intervals as may be provided in the conditions of the EA.

e) The ECO shall obtain additional photographic records *during construction* of any damaged areas requiring interim protection and/or rehabilitation. An incident register with an indication of the date, time, type of damage and reason for the damage shall be recorded to ensure the responsible party is held liable. The contractor shall be held liable for all unnecessary damage to the environment as a result of any negligent behaviour.

f) Post-rehabilitation inspections three (3), six (6) and twelve (12) after rehabilitation activities are complete must be conducted by the ECO and/or vegetation ecologist to ensure conformance to the rehabilitation requirements, and where necessary, provide recommendations for any further rehabilitation actions required. This proposed timeframe for rehabilitation monitoring allows one full annual seasonal growing cycle to pass and for more accuracy and confidence in assigning success rates to rehabilitation.

g) Compilation of a close out audit report by the ECO, focusing on final EA and EMPr compliance and the success of rehabilitation completion.

5.3 Reporting Procedures

5.3.1 Documentation

The following documentation must be kept on site by the contractor in order to record conformance to the conditions of the EA and EMPr. A site-based environmental file should include:

a) Copy of the EA and EMPr.
b) Method Statements compiled by the contractor and approved by the PM / ECO.
c) Copy of the Rehabilitation Plan/Method Statement.
d) A set of environmental registers which include:
    i. Complaints register, including details of complaints and actions required/taken (with dates).
    ii. Incident register, including copies of notification of Emergencies and Incidents (this must be accompanied by dated photographic records).
    iii. Waste registers and waste manifests.
e) Copies of waste documentation such as Safe Disposal Certificates (SDCs).
f) Material Safety Data Sheets (MSDSs) for all hazardous substances.
g) Minutes and attendance registers of all progress meetings held.
h) Monitoring results including environmental audit and inspection reports, checklists, register of audits, etc.
i) Copies of any environmental Non-Conformance Reports (NCRs) issued.
j) Copies of any Corrective Action Reports (CARs) in response to NCRs issued.
k) Notifications of Emergencies and Incidents.

5.3.2 Method Statements

It is a statutory requirement to ensure the wellbeing of employees and the environment. To allow the mitigation measures in this document to be implemented, task-specific method statements should be developed for each set of tasks. A method statement details how and when an activity will be carried out, detailing possible dangers/risks, and the methods of control required. The contractor will be accountable for all actions taken in non-conformance of the approved Method Statements. The Contractor shall keep all the method statements and subsequent revisions on file, copies of which must be distributed to all relevant personnel for implementation. Determining which activities require a method statement involving environmental impacts may be decided upon by The Contractor, the ECO, the Project Manager, or the Contractor themselves prior to the said activity commencing. Guidelines for method statements are included in **Annexure G**.

5.3.3 Environmental Registers

Before commencement of construction, the contractor, with assistance by the ECO, will establish various environmental registers (as templates) for the Project. The contractor will ensure that the information is recorded for all complaints/incidents as per the guideline register templates, attached as **Annexure E** at the end of this document. The environmental registers will form an integral part of construction records to be transferred to the developer upon completion of construction. These records will be kept with the EMPr and will be made available on requested by the authorities and ECO. Maintenance and updating of environmental registers during the operational phase will need to continue as an internal function of the developer who must delegate this task to an appropriately competent site-based permanent employee.

5.3.4 Stakeholder Engagement

During construction, the contractor must ensure that relevant stakeholders are informed and updated throughout the activities. Sufficient signage should be erected around the site (including at the entrance), informing the public of the activities taking place. It is suggested that signboards be erected and include the following information:

- The name of the contractor; and
- The name and contact details of the site representative to be contacted in the event of emergencies or raising a public complaint.

5.3.5 Non-Conformance Report

A Non-Conformance Report (NCR) will be issued to the contractor as a final step towards rectifying a failure in complying with a requirement of the EA or EMPr. This will be issued by the ECO or Project/Site Manager to the contractor in writing. Preceding the issuing of an NCR, the contractor must be given an opportunity to rectify the issue. Should the ECO assess a non-EMPr related incident or issue and find it to be significant (e.g. non-repairable damage to the environment), it will be reported to the relevant authorities and immediately escalated to the level of a NCR.

5.3.6 Environmental Emergency Response Plan

If there is no Health and Safety Plan/Specification specifically compiled and approved for the proposed development, the contractor must compile an Environmental Emergency Response Plan/Method Statement. Emphasis should be placed on environmental aspects such as fire, flood and pollution incidents and prevention and any other Section 30 NEMA incidents and the associated reporting protocol. As far as any mitigation measures to prevent or avoid environmental incident and emergencies from occurring, which are within reasonable parameters for the contractor to control, such should be specified in a project specific Plan/ Method Statement.

6 DETAILED ENVIRONMENTAL MANAGEMENT PROGRAMME

The EMPr provides the framework for environmental monitoring and specifies the minimum requirements to be implemented by the contractor [during construction as per the contractual scope of works] and the end-user/developer [during operations of the facility] in order to minimise and manage negative environmental impacts and promote good environmental management practise. It is important that the EMPr requirements be systematically reviewed, understood, implemented and adhered to at all times.

This section comprises the environmental specifications (**ES**) for the Project.

6.1 ENVIRONMENTAL SPECIFICATIONS (ES)

The approach for ES implementation and the associated monitoring requirements relating to specific measures/aspects of ES implementation (for the duration of the Project) are divided into 5 phases:

a) Planning and Design.
b) Pre-Construction (includes assessments, approvals, permits, authorisations).
c) Construction (includes contractor appointment and site establishment).
d) Post-Construction (includes site de-establishment and rehabilitation); and
e) Operations

6.1.1 Scope of Application for the Environmental Specifications

The entire footprint including the site camp, site offices, designated working areas, internal access routes and the immediate surrounding areas fall within the scope of the EMPr during construction. The scope also applies to the final footprint *i.e.,* the new facility upon completion of construction and during operations. Any new personnel, sub-contractors, maintenance staff, plant, vehicles, machinery, and materials delivered to/stored on the site/facility will need to comply with the EMPr.

6.1.2 Environmental Principles for the Construction and Operational Phases

The following core environmental principles apply during construction:

- Construction is typically a disruptive activity and maximum consideration must be given to minimising disturbances on the surrounding community and natural environment.
- Only the authorised 'construction footprint' approved for development should be utilised and occupied. No site 'creep' or increasing of the footprint to an area beyond which is authorised is permitted.
- All relevant legislation should be adhered to, and all relevant permits and permissions always obtained and complied with.
- The developer and contractor should foster collaborative and cooperative relationships with all relevant stakeholders including the authorities (*i.e.* DFFE, DWS, DAFF, conservation authorities, etc.) any other neighbouring landowners/land users and members of the adjacent local communities. Professional and

timely communication with these parties as and when required will assist in the successful implementation of the proposed development and its future success.

- The contractor and other project role-players should acknowledge and sign the Letter of Acceptance (**Annexure F**) confirming their environmental commitments in terms of the EMPr.
- Wherever possible, both the developer and contractor should seek to employ local labour and maximise the involvement of small, local business enterprises into the project.

The following core environmental principles apply during operations:

- Maximum consideration should be given to minimising disturbances [noise, traffic, dust, road damage, etc.] to the surrounding landowners and community.
- Only the authorised 'development footprint' should be utilised and occupied. No site 'creep' or increasing of the footprint to an area beyond which is authorised is permitted.
- All relevant legislation should be adhered to, and all relevant permits and permissions obtained and complied with at all times.
- The developer and/or any facility end-users should maintain collaborative and cooperative relationships with any relevant stakeholders including the authorities (*i.e.* DFFE, DWS, DAFF, conservation authorities, etc) and any other neighbouring landowners/land users and members of the adjacent local communities. Open communication with these parties as and when required will assist in successful and smooth operations at the facility into the future.
- Where applicable, any end-users or operational contractors/tenants contracted by the developer and/or infrastructure owner should acknowledge and sign the Letter of Acceptance (**Annexure F**) confirming their environmental commitments in terms of the EMPr.
- Wherever possible, the developer and/or any facility end-user contractors should seek to employ local labour and maximise the involvement of small, local business enterprises into the operations of the facility.

6.2 PLANNING AND DESIGN PHASE

This section sets out the requirements that must be undertaken prior to commencement of any construction activity and includes the legal permitting / authorisation requirements, other ancillary plans and activities; and design considerations. Mitigation measures and recommendations that should be considered during the planning and design phase are provided. The project team is responsible for ensuring that the design of the facility either responds to or is in alignment with the environmental constraints and opportunities in the overarching and relevant Strategic Development Framework (SDF) and Integrated Development Plan (IDP) for the Local Municipality and conforms to any jurisdictional and municipal planning requirements.

Planning and design activities should be undertaken within the context of all relevant legislative requirements and guidelines with due consideration been taken regarding any authority requirements and any landowner and local community concerns. Where appropriate, these should be addressed through adequate design and planning in terms of the suite of documentation [*i.e.* assessment reports, specialist reports, management plans, monitoring programmes, records of communication, final building and layout plans, etc.] to be submitted to the respective jurisdictional authorities [*i.e.* DFFE, LDM, DWS, etc.] for review, input, comment and an ultimate decision [by DFFE] on the proposed development application.

6.2.1 Management Objective

The primary environmental objective, during this phase, is to ensure the best suited environmental option for the proposed development is selected based on the final design (*i.e.* plans, drawings, layouts, surveys, environmental assessments and specialist studies) undertaken during the planning phase. The project-specific **BAR** and all respective **Appendices** and **Annexures** which supplement the **BAR** will represent the overall environmental management framework which should be adhered to during commencement of the activity [*i.e.* construction] and the subsequent operational phase. To ensure that the development's activities are undertaken without significant disruption to other land uses and activities in the surrounding area, the following objective, impact management outcomes and monitoring requirements have been identified:

Objective	Ensure the best suited environmental option for the proposed development is selected based on the final design
Impact Management Outcomes	- The design meets the objectives and does not degrade the natural environment. The final design should be based on project plans, drawings, layouts, surveys, environmental assessments and specialist studies undertaken and should be in alignment with municipal plans (SDF & IDP) - Design and layouts should respond to the mitigation measures and recommendations in the BAR/EIR. - Construction and operational phase activities should not conflict with or disrupt surrounding land-use activities with a minimal negative impact on socio-economic, cultural and visual/aesthetic conditions.
Monitoring	- Review of the final design by the Project Manager, Engineer, Local Municipality and Environmental Authorities prior to the commencement of the activity i.e. Construction.

6.3 PRE-CONSTRUCTION PHASE,

6.3.1 Authorisations, Permits and Licences

- All necessary authorisations, permits and licences must be obtained by the developer/contractor prior to the commencement of the activity *i.e.,* construction.

6.3.2 Appointment of Contractor

- The construction contractor must ensure that this EMPr forms part of any contractual agreements with any other contractors and sub-contractors for the execution of the project. All contractors must make adequate provision in their budgets for implementation of the EMPr.
- The Principal Contractor, including any sub-contractors and suppliers as may be the case, must comply with the relevant provisions of the EMPr, applicable environmental legislation, associated regulations, and any applicable local by-laws.

6.3.3 Appointment of an ECO

- An independent ECO must be appointed by the holder of the EA (the developer) at their cost to monitor the implementation of the EMPr.
- The ECO must be appointed at least 30 days prior to the commencement of any site activities including, where necessary, a Search & Rescue of the site footprint. During this period, the ECO will review all relevant documentation pertaining to the Project.
- Once an ECO has been appointed, he/she must undertake monthly site inspections and provide monthly environmental audit reports for the duration of the construction and rehabilitation phases. Each audit report must contain the full results of the audit and should determine, by way of audit findings, whether the various aspects of the development (*i.e.* audit criteria) are deemed to be *compliant*, *non-compliant* or *not-applicable*. Any conditions or findings found to be *not applicable* must be substantiated/explicated in terms of aspects (audit criteria) of the development which have either not yet commenced, are no longer relevant or have been deemed to be applicable, as may be the case. If any recommended actions to address audit findings are, for example, required from any other organ of state, stakeholder, etc, these must be clearly stated with reasons.

6.3.4 Preparation of Method Statements

- Method Statements must be submitted by the contractor to the ECO and must be adhered to by the contractor, sub-contractors and the PM for the duration of the project. These can relate to water and storm water management requirements, traffic requirements, solid waste management requirements, fuel storage and filling and dispensing of fuel (diesel and petrol), hydrocarbon spills, contaminated water and wastewater management, the storage and/or transport of hazardous materials and chemicals,

standard emergency procedures, biohazard control, etc and for any additional activities which the ECO and/or PM may deem necessary.

- The ECO will monitor the implementation of the method statements, all copies of which must be submitted to the ECO for review prior to commencing with the activity. Revisions to approved method statements may become necessary.
- To this end, an agreement must be reached between the PM, ECO and contractor as to how a site-based instruction system of document revision, submission, review, approval, issuing, re-issuing and record-keeping is carried out.

6.3.5 Environmental Training and Awareness

It is important to ensure that the Contractor has the appropriate level of environmental awareness and competence to ensure continued environmental due diligence and ongoing minimisation of environmental harm. It is vital that all personnel are adequately trained to perform their designated tasks to an acceptable standard. The contractor shall ensure that all employees and sub-contractors who carry out all or part of the contractor's obligations are adequately trained with regard to the implementation of the EMPr, as well as environmental legal requirements and obligations. Training shall be conducted by the contractor EO as and when required, as determined by the ECO by means of and initial (once-off) induction, continuous toolbox talks, awareness posters, meetings etc. General EA and EMPr requirements should form part of the formal site induction for all contractors, sub-contractors and casual labourers, preferably in their native language.

Awareness training should be provided in a verbal and/or visual format. Induction training may be a once-off event however the contractor should make provision for internal weekly training, holding of toolbox talks and displaying of environmental awareness posters. In addition to training, general environmental awareness must be fostered among the project's workforce to encourage the implementation of environmentally sound practices for the full duration of construction. The aim is to ensure environmental accidents are minimised and good environmental compliance is continuously attained.

Environmental training is aimed at:

- Promoting environmental awareness.
- Informing the contractor of all applicable environmental procedures, policies and programmes.
- Providing generic and simplified training on the implementation of environmental management specifications; and
- Providing job-specific environmental training in order to understand the key environmental features of the construction site and the surrounding environment.

The contractor shall ensure that attendance records of all training interventions are kept in accordance with the record keeping and document control requirements and records must be sent to the ECO at intervals

determined by the ECO. The training records shall verify each of the targeted personnel's training experience. If necessary, the ECO and/or a translator should be called to the site to further explain any aspects of environmental or social behaviour which are unclear. Basic environmental awareness material is attached as an **Annexure D**.

6.4 CONSTRUCTION PHASE

To simplify the EMPr requirements, each aspect related to the EMPr has been addressed in the tables below under relevant sub-headings. Each action number within the tables is supported by mitigation measures and actions which will need to be adhered to / implemented by the responsible party. The terms used in the tables throughout this section are briefly described below for ease of reference:

- **Mitigation Measures and Actions**

  This section indicates the environmental measures, actions and controls required to either prevent and/or minimise the potential impacts on the environment that is associated with the project.

- **Responsibility**

  This section indicates the party responsible for implementing the mitigation measures and actions laid out in the EMPr.

6.4.1 Site Establishment and Access

Action no.	Mitigation Measures and Actions	Responsibility
1.	The contractor shall make all efforts to establish their construction camp, offices, workshops and any other infrastructure preferably on any **previously disturbed/impacted areas** in a manner that does not adversely affect the natural environment, with the assistance of an EO.	Contractor
2.	Prior to the establishment of the site camp/office, the contractor will produce a site **layout and access plan** showing the positions of all equipment storage, waste stockpiling, fuel storage areas, access routes and other infrastructure for approval by the ECO and PM.	Contractor
3.	The construction area must be **clearly demarcated** on the layout and access plan, and all other areas (in particular any environmentally sensitive buffers) must be considered '**no-go areas'** for all construction activity, personnel and equipment.	Contractor
4.	It is recommended the contractor first **identifies/marks** all routes which will ultimately become permanent access roads and use these as temporary access routes during construction. Markers should show the direction of travel to which the access route leads.	Contractor
5.	Adequate **signage** must be placed in the areas where construction will take place warning the public and neighbouring landowners of the activities taking place.	Contractor
6.	For **security** measures, it is recommended that the site be secured and manned by security on a 24-hour basis for the duration of construction.	Contractor
7.	The construction camp's **housekeeping** must be kept in an orderly state at all times (managing stacking, storage, waste areas, etc.)	Contractor
8.	**Vegetation** removal for site establishment is to be kept to an absolute minimum. No trees are to be removed, where applicable, with the exception of weeds and alien invader plants.	Contractor

9.	The physical footprint of the construction camp must be located a minimum horizontal distance of 100m or further from any **freshwater resource/watercourse** and any associated riparian buffers identified on or around the site and/or out of the 1:100 year flood line, if known.	Contractor
10.	All **specialist recommendations**, as per the freshwater ecologist and terrestrial botanist reports should be adhered to.	Contractor/ Developer
11.	Any **permanent infrastructure** planned directly within watercourses and the associated buffers, such as drifts or low-level watercourse/road crossings, should be authorised from the relevant DWS authority, either via GA or WUL.	Contractor/ Developer
12.	The contractor must ensure that a **storm water drainage system** on the temporary camp site/office area is adequately designed to prevent standing water and/or sheet erosion from taking place. In this regard, an overarching **Stormwater Management Plan** which applies to the overall development infrastructure must be adhered to by the contractor during construction.	Contractor
13.	Adequate drainage and **erosion protection** in the form of cut-off berms or trenches must be provided around the site, where necessary. Any **steep gradients** on site must be avoided, if and where applicable.	Contractor
14.	Where applicable, the contractor must mark **all internal access routes**. Markers should show the direction of travel to which the access route leads.	Contractor
15.	All **speed limits** must be strictly adhered to at all times.	Contractor
16.	If there are **high volumes** of construction traffic along site access routes, dust prevention measures must be implemented to reduce dust creation and to prevent any driving over adjacent areas.	Contractor
17.	Any **temporary** access routes should remain must be strictly one-way and be a maximum width of 3m.	Contractor
18.	No **vendors** or other similar traders should be allowed to access the site.	Contractor
19.	Maintain good **housekeeping** at all areas.	Contractor

6.4.2 Ablution/Sanitation

Action no.	Mitigation Measures and Actions	Responsibility
1.	The contractor must provide a minimum of one **mobile chemical toilet** per 15 persons/employees.	Contractor
2.	The chemical toilets must be **strategically placed** and **re-positioned** (to allow easy access to workers, preferably no more than a 100m from each work area) and must not be situated within 32m from any **freshwater resource/watercourse** *i.e.* not within the 32m buffer.	Contractor
3.	All ablution activities must take place in these facilities and all wastewaters must be contained and **disposed** of at an established/registered wastewater treatment site/works. A registered waste service provider must service the facilities on a regular basis and provide waste disposal certificates which must be maintained on the contractor's site environmental file.	Contractor
4.	The contractor must ensure that toilets are **serviced** (cleaned or emptied) regularly (minimum of once per week, possibly twice) and that no spillage occurs during routine servicing and maintenance.	Contractor
5.	All temporary/portable toilets must be **secured** to the ground to prevent them from toppling due to wind or any other cause.	Contractor
6.	Provision of the necessary **sanitary measures** *i.e.* potable water for hand-washing and toilet paper must be available at all times.	Contractor
7.	**Unauthorised dumping** / spilling of waste from toilets into the environment and burying of waste are strictly prohibited.	Contractor

6.4.3 Permanent infrastructure and associated internal access roads

Action no.	Mitigation Measures and Actions	Responsibility
1.	Only the '**footprint'** for the planned CEA infrastructure and associated access roads/routes etc, as per the final layout and design plan and as authorised in the EA conditions, is permitted on the property. Should any **significant alterations** to the 'authorised footprint' be considered necessary such as alternative/additional access roads and infrastructure and/or alternative designs, the developer in consultation with the ECO must engage with the authority and clarify, in writing, whether any changes would be non-substantive or whether substantive amendments to the EA and EMPr would be required.	Contractor/ Developer
2.	Strict **access control** should be implemented to reduce the risks of heavy plant/vehicle access indiscriminately all over the site causing unnecessary environmental damage.	Contractor
3.	Any **No-go areas** on the site footprint must be indicated as such with adequate warning signs. Any ecologically sensitive areas *i.e.* watercourses, wetlands or sensitive vegetation identified on the site are considered **No-go areas.**	Contractor
4.	Any **permanent infrastructure** planned directly within watercourses and the associated buffers, such as drifts or low-level watercourse/road crossings, should be authorised from the relevant DWS authority, either via GA or WUL.	Developer

5.	All **specialist recommendations**, as per the freshwater ecologist and terrestrial botanist reports should be adhered to.	Contractor/ Developer
6.	Adequate drainage and **erosion protection** in the form of cut-off berms or trenches must be provided around the site, where necessary. Any **steep gradients** on site must be avoided, if and where applicable.	Contractor
7.	It is recommended the contractor first **identifies/marks** all routes which will ultimately become permanent access roads and use these as temporary access routes during construction. Markers should show the direction of travel to which the access route leads.	Contractor
8.	All **speed limits** must be strictly adhered to at all times.	Contractor

6.4.4 Ecologically Sensitive and No-go Areas

Action no.	Mitigation Measures and Actions	Responsibility
1.	Any ecologically sensitive areas (e.g. watercourses, wetlands or protected vegetation) are considered **No-go areas** on the site footprint must be indicated as such with adequate barricading and warning signage.	Contractor
2.	All **specialist recommendations**, as per the freshwater ecologist and terrestrial botanist reports should be adhered to. To minimise the risk to watercourses during the construction of any low water crossings / drifts /fords within drainage lines, mitigation measures as per the watercourse risk assessment matrix [RAM] should be followed.	Contractor/ Developer
3.	Ecologically sensitive areas which do not form part of the approved development footprint should not be accessed by machinery or workers for any reason. Any contractors observed within these 'No-go' areas should be fined as per a fining schedule/system setup for the project.	Contractor/ Developer

6.4.5 Plant & Equipment Maintenance

Action no.	Mitigation Measures and Actions	Responsibility
1.	Any heavy machinery and construction vehicles kept on site are to be stored in a dedicated vehicle maintenance yard which must be illustrated on a construction camp layout map.	Contractor
2.	No machinery or vehicles may be extensively repaired anywhere on site other than in a dedicated maintenance yard, or alternatively, off site at an existing/established commercial service/repair workshop. A dedicated maintenance area must be demarcated with an impermeable surface leading to an oil-water separator or containment sump. Any servicing of vehicles done on-site must be within a dedicated service bay which is impermeable, bunded and equipped with spill kit material, drip trays, etc.	Contractor
3.	All vehicles and equipment must be serviced regularly to avoid the contamination of the area from fuel, oil and hydraulic fluid leaks, spills, etc.	Contractor
4.	Machinery or equipment used on site must not constitute a pollution hazard in respect of hydrocarbon substances.	Contractor
5.	Access of all maintenance and material delivery vehicles must be strictly controlled.	Contractor
6.	The contractor must order any faulty equipment to be repaired or withdraw from use if the equipment or machinery is continually polluting and/or irreparable.	Contractor
7.	Suitably covered receptacles must be available at all times and conveniently placed for the disposal of waste. All waste/used oils, grease or hydraulic fluids must be placed therein, and these receptacles will be removed from the site on a regular basis for disposal at a registered or licensed disposal facility.	Contractor

6.4.6 General and Hazardous Substances and Materials

Action no.	Mitigation Measures and Actions	Responsibility
1.	Refuelling, servicing or storage of hazardous substances must not take place within 100m of any watercourse.	Contractor
2.	A spill kit must be readily available on site if heavy machinery and/or hazardous substances are to be used on the project.	Contractor
3.	Storage areas must be designated, demarcated and fenced off within the confines of the site footprint.	Contractor
4.	Hazardous substance storage areas should be secured, under lock and key, so as to minimise the risk of theft and/or unauthorised handling.	Contractor
5.	Suitable fire prevention facilities (extinguishers, firebeaters) must be available at all storage facilities.	Contractor
6.	All fuel storage tanks and associated facilities must be designed and installed in accordance with the relevant oil industry standards, SANS codes and other relevant requirements.	Contractor
7.	Symbolic safety signs illustrating '*No Smoking'*, *'No Naked Flames'* and '*Danger'* are to be prominently displayed in and around the fuel storage area.	Contractor
8.	Appropriate storage facilities for the storage of oils, paints, grease, fuels, chemicals and any hazardous materials to be used must be provided to prevent spillages onto the ground around the storage area(s). These pollution prevention measures for storage should include a bund wall high enough to contain at least 110% of any stored volume. Such a facility must be on an impervious surface. The storage area must be securely fenced and all hazardous substances such as fuel, oils, chemicals, etc, must be stored therein. Drip trays, a thin concrete slab or a facility with a durable PVC lining, must be installed in such storage areas with a view to prevent soil contamination and surface and ground water pollution.	Contractor
10.	The capacity of any fuel storage tank on site must be clearly displayed and the product contained within the tank clearly identified.	Contractor
11.	Only empty and externally clean tanks/drums may be stored on the bare ground. All empty and externally dirty tanks/drums must be sealed and stored in a designated, barricaded area where the ground surface has been protected.	Contractor
12.	If fuel is dispensed from 210 litre (44 gallon) drums, the proper dispensing equipment must be used and accompanied by a drip tray. The drum must not be tipped in order to dispense fuel. The dispensing mechanism of the fuel storage tank must be stored in a waterproof container when not in use.	Contractor
13.	Any spilled/contaminated fuel, oil and chemical contaminated rags must be stored in leak-proof containers and disposed of at an approved hazardous waste site. Safe Disposal Certificates (SDCs) must be obtained for any hazardous wastes which are disposed of and such documentation must be maintained for record-keeping purposes on site.	Contractor
14.	Storage sites will be provided with bunds to contain any spilled liquids and materials. These storage facilities (including any tanks) must be on an impermeable surface that is protected from the ingress of stormwater from surrounding areas in order to ensure that accidental spillage does not pollute local soil or water resources.	Contractor

15.	Material Safety Data Sheets (MSDSs) must be readily available on site for all chemicals and hazardous substances to be used on site. Where possible the available, MSDSs should additionally include information on ecological impacts and measures to minimise negative environmental impacts during accidental releases or spillages.	Contractor
16.	Staff dealing with these materials / substances must be aware of their potential impacts and follow the appropriate safety measures.	Contractor
17.	A registered waste disposal service provider (sub-contractor) must be employed to remove any waste oil and other hazardous waste. Such waste must only be disposed of at licensed landfill sites designed to handle hazardous waste. Appropriate SDCs must be provided for all hazardous waste being disposed of.	Contractor
18.	The contractor must ensure that all staff are made aware of the health risks associated with any hazardous substances used and has been provided with the appropriate protective clothing/equipment in case of spillages or accidents and have received the necessary training.	Contractor
19.	Any cement / concrete must not be mixed directly on the ground. Mixing trays and/or impermeable sumps must be used at all mixing and supply points. Unused cement bags are to be stored so as not to be affected by rain or runoff events.	Contractor
20.	If applicable, the washing of concrete trucks on site is prohibited unless disposed of into a designated wash area approved by the ECO.	Contractor
21.	Used cement bags must be stored in weather-proof containers to prevent windblown cement dust and water contamination. Used cement bags must be disposed of on a regular basis via the solid waste management system and must not be used for any other purpose.	Contractor
22.	All remains of excess/un-used cement or concrete must be physically removed on completion of the plaster or concrete pour section and disposed of. Washing the remains into the ground is not acceptable as soil contamination and groundwater pollution may occur.	Contractor
23.	No paint products may be disposed of on site.	Contractor
24.	Care should be taken of the storage thresholds contained in the 2014 NEMA EIA Regulation Listing Notices as well as the NEMWA waste management listed activities contained in Category A and B.	Contractor
23.	The contractor must maintain a record of the sourcing of all materials used during construction.	Contractor
25.	Maintain good housekeeping at all times.	Contractor

6.4.7 Spills, Incidents and Pollution Control

Action no.	Mitigation Measures and Actions	Responsibility
1.	Any spillage, which may occur, must be investigated and immediate action must be taken according to the requirements of a Spill contingency plan/method statement. This must also be reported to the ECO and Project Manager.	Contractor
2.	In the case of a spill of hydrocarbons, wastewater, sewerage, chemicals, bituminous, cement or asphalt materials in the contractor's laydown storage/areas or on the construction site, the spill should be contained and cleaned up and the material together with any contaminated soil collected and disposed of as hazardous waste to minimise pollution risks and reduce bunding capacity.	Contractor
3.	Should a pollution incident occur on site, the contractor must: • Implement reasonable measures immediately to contain and minimise the impacts of the incident • Notify all persons whose health may be affected by the incident • Undertake clean up procedures immediately • Notify the ECO/PM of the incident immediately and advise as to what corrective actions/measures have been implemented • Record the incident in the Environmental Incident Register; and • Implement measures to prevent similar incidents from occurring in the future.	Contractor
4.	Where applicable, concrete mixing must be confined to as few areas as possible and *ad-hoc* mixing is to be avoided. Any areas where concrete mortar is mixed must be cleaned up after use. Concrete mixing is to be undertaken on impervious surfaces, such as on mortar boards.	Contractor
5.	Any works requiring large concrete quantities should preferably source concrete from mobile ready-mix concrete mixers [trucks] from established commercial suppliers off-site. This will limit the impacts associated with concrete batching on site.	Contractor
6.	Stockpiles of soil and construction material are to be bermed to prevent any lateral spread of leachate or polluted runoff.	Contractor

6.4.8 Waste Management

6.4.8.1 General Waste

Action no.	Mitigation Measures and Actions	Responsibility
1.	General waste produced on site will likely include: • Office waste (e.g. printer cartridges, paper, plastics, packaging, etc); • Construction waste (scrap metal, wood, glass, rubble, packaging); and • General domestic waste (food, cardboards, paper, bottles, tins). An adequate number of general waste receptacles (including skips and bins) must be positioned around the construction camp laydown area and on site (working areas) to collect all waste types and domestic refuse and to minimise littering.	Contractor
2.	Bins must be clearly marked/labelled and appropriately lined for efficient control and safe containment and disposal of waste.	Contractor
3.	Different waste bins, for different waste streams must be provided to ensure correct waste separation.	Contractor
4.	Where applicable, a demarcated area must be allocated for waste sorting and disposal on the site.	Contractor
5.	All waste receptacles must be appropriately covered to ensure waste does not affected by wind, rain or vermin.	Contractor
6.	Larger quantities of general waste produced on site (e.g. rubble) are to be collected in skips for disposal at a registered landfill site. Hazardous waste in not to be mixed or combined with general waste earmarked for disposal at the municipal landfill site.	Contractor
7.	Under no circumstances is waste to be burnt or buried on site. The excavation and use of rubbish pits on site is forbidden.	Contractor
8.	Waste bins must be cleaned out on a regular basis to prevent any windblown waste and/or visual disturbance.	Contractor
9.	All general waste must be removed from the construction areas on a daily basis and disposed of in suitable waste receptacles at the designated waste storage area in the construction camp.	Contractor
10.	The contractor must ensure that all general waste is disposed of at an appropriately licensed waste disposal facility/landfill. Through exploring practical means for reducing, reusing and recycling waste generated in undertaking the activity, the contractor should aim to produce and dispose of a minimum amount of waste as possible.	Contractor

6.4.8.2 Hazardous Waste

Action no.	Mitigation Measures and Actions	Responsibility
1.	Hazardous wastes which may be produced on site, derived from hazardous substances, include: • Oil and other lubricants, diesel, petrol, paints, solvents. • Containers that contained chemicals, oils, paints, or greases; and • Other material e.g., used rags, soils, batteries, gravel and water contaminated by hazardous substances (i.e. oil, fuel, grease, chemicals or bitumen).	Contractor
2.	Hazardous waste is to be disposed of at a Licenced Hazardous Waste Landfill Site. A licensed waste disposal site must be identified at the inception of the Project.	Contractor
3.	Hazardous waste bins must be clearly labelled, stored in a contained area (or have a drip tray) and covered (either stored under a roof or the top of the container must be securely covered with a lid).	Contractor
4.	A hazardous waste disposal certificate, or safe disposal certificate (SDC) must be obtained from the waste removal company as evidence of correct, lawful disposal.	Contractor

6.4.8.3 Wastewater

Action no.	Mitigation Measures and Actions	Responsibility
1.	All wastewater generated from activities related to the site must be disposed of in a suitable manner so as not to cause any surface or subsurface water pollution or health hazard.	Contractor
2.	Wastewater including any sewerage or cement-contaminated water must not be allowed to enter any stormwater infrastructure or watercourse and must be managed by the contractor to ensure that any existing water resources beyond the site footprint are not polluted by site-based construction activity.	Contractor
3.	Where applicable and possible, used oil/hydrocarbon-contaminated wastewater should be collected and transported to a ROSE-registered facility (https://rosefoundation.org.za/), or equivalent for recycling or disposed of at an appropriate hazardous wastewater treatment facility. All SDCs are to be obtained and maintained as records by the contractor.	Contractor
4	Any permanent wastewater infrastructure [for storage, transport, recycling, treatment or off-site disposal] required for the operational phase of the development must be pre-approved, authorised and constructed as per the final design and layout.	Contractor / Developer

6.4.9 Emergency Preparedness

Action no.	Mitigation Measures and Actions	Responsibility
1.	An emergency preparedness plan/method statement, emphasising fire prevention, should be drafted before construction commences. Fire outbreaks pose a major risk to human life, property and vegetation in the surrounding area. Provision must be made to ensure preparedness toward preventing fires caused by construction activity or elsewhere to limit or prevent damage to surrounding areas. The plan must specify how fires will be prevented from breaking out causing damage to any surrounding areas during construction. Contact numbers for any local fire associations and/or fire-fighting authorities should be included.	Contractor
2.	Training for emergency preparedness and potential emergency situations [*i.e.* fire outbreaks, floods, explosions, accidents, first aid, evacuations, snake bites, etc.] should be included in a Health and Safety plan for the development.	Contractor

6.4.10 Heritage

Action no.	Mitigation Measures and Actions	Responsibility
1.	If any heritage site, grave or artefact is uncovered or discovered on site, work in the immediate vicinity must be stopped immediately. Any identified site must be clearly marked as a “No-go” area. In the event that a historical grave or heritage site is exhumed/discovered, the provincial Heritage Resource Authority (HWC) should be informed immediately. A specialist archaeologist will be required to facilitate any process pertaining to such a find/discovery.	Contractor
2.	The contractor must take reasonable precautions to prevent any person from removing or damaging any such artefact. Upon any discovery thereof, the contractor must immediately inform the ECO and Project Manager of such discovery who, in turn, must inform SAHRA.	Contractor
3.	Any permits, if necessary, shall be obtained from the relevant Heritage Resources Authority for the destruction/removal of any Cultural or Heritage Artefacts.	Contractor
4.	Any mitigation measures which may be recommended by a specialist archaeologist, should be followed. Work may only resume once clearance is given in writing by the authority and/or the archaeologist.	Contractor

6.4.11 Noise Control

Action no.	Mitigation Measures and Actions	Responsibility
1.	Neighbouring landowners / community residents adjacent to the site must be notified about construction prior to commencement.	Contractor
2.	All construction vehicles and equipment are to be kept in good repair and must be fitted with standard industry silencers prior to construction.	Contractor
3.	Where possible, stationary noisy equipment [for example compressors, generators, etc.] must be encapsulated in acoustic covers, screens or sheds. Portable acoustic shields should be used in the case where noisy equipment is not stationary (e.g. for drills, angle grinders, chipping hammers).	Contractor
4.	Construction activities, and particularly excessively noisy activities, are to be limited to reasonable working hours during the day.	Contractor
5.	Any machines used intermittently must be shut down in the intervening periods between work or throttled down to a minimum.	Contractor
6.	In general, operations must meet the noise standard requirements of the Occupational Health and Safety Act (Act No 85 of 1993).	Contractor
7.	Construction staff working in areas where the 8-hour ambient noise levels exceed 75dBA must wear ear protection equipment.	Contractor
8.	Noise levels must be kept within acceptable limits. All noise and sounds generated must adhere to the relevant SANS standard.	Contractor
9.	No pure tone sirens or hooters may be utilised except where required in terms of SANS standards or in the event of emergencies.	Contractor
10.	Noise from the workforce must be controlled, toolbox talks should remind workers to keep noise to a minimum.	Contractor
11.	Noise suppression measures must be applied to all construction equipment. Construction equipment must be kept in good working order and where appropriate fitted with silencers which are kept in good working order. Should the vehicles or equipment not be in good working order, the contractor may be instructed to remove the offending vehicle or machinery from site.	Contractor
12.	The contractor must take measures to discourage labourers from loitering in areas and causing noise disturbances. Where possible labourers must be transported to and from the site by the contractor or by dedicated service providers using appropriate transport.	Contractor
13.	If applicable, neighbours are to be given at least three days warning prior to any blasting or piling activities.	Contractor

6.4.12 Dust Control

Action no.	Mitigation Measures and Actions	Responsibility
1.	Any dust created during construction should not be allowed to adversely affect surrounding landowners, businesses, or residents or any of the contractor's workforce. Dust should not reduce the visibility for private vehicles making use of the public road passing by the site.	Contractor
2.	All construction vehicles and equipment are to be kept in good working order.	Contractor
3.	Shade cloth fencing is to be used to reduce dust aggravation in any high usage/exposed areas, particularly during high wind conditions and in the drier season. In areas where there is a large potential for dust liberation, wet suppression using water and/or eco-friendly dust suppressants should be applied to the affected areas.	Contractor
4.	Construction activities are to be contained to reasonable hours during the day avoiding periods of sunrise and sunset.	Contractor
5.	A dust suppression register (water and/or dust suppressant usage) as well as a complaint register need to be kept and updated.	Contractor
6.	All complaints received need to be investigated with remedial action taken communicated to the affected party within 14 days.	Contractor

6.4.13 Sediment Management

Action no.	Mitigation Measures and Actions	Responsibility
1.	The freshwater ecologist specialist recommendations should be adhered to. To minimise the risk to watercourses during the construction of any temporary and/or permanent low water crossings / drifts /fords within drainage lines, mitigation measures as per the watercourse risk assessment matrix [RAM] should be followed.	Contractor/ Developer
2.	Before any earthworks commence, sediment control/silt capture measures (e.g. berms, bidim, silt curtains) must be installed, where appropriate, to limit any sedimentation of the site's natural drainage system and farm road network around the site. Quantities of silt fences/curtains shall be decided on site with the engineer, contractor and ECO.	Contractor/ Developer
3.	Any installed sediment control/silt capture measures must be regularly checked and maintained (dredged, cleared, de-silted to ensure continued capacity to trap sediment and silt), and repaired where necessary.	Contractor/ Developer

6.4.14 Soil and Erosion Management

Action no.	Mitigation Measures and Actions	Responsibility
1.	Minimise the development footprint so that only areas where infrastructure will be located are cleared	Contractor
2.	Topsoil shall be removed from all areas cleared of vegetation, and retained (stockpiled) for future rehabilitation use, where applicable. Topsoil shall be stockpiled in areas identified by the ECO and PM not higher than 2m (or in accordance with the engineering specifications) and may not be removed from site, or used for any purpose other than in the final rehabilitation and levelling/landscaping of the site.	Contractor
3.	Topsoil stockpiles must be kept free of contaminants, not be compacted or disturbed, kept separate with any materials or equipment and domed at the top to promote runoff. Topsoil should be transferred to its intended site of storage immediately following site clearance. The period between stockpiling of topsoil and its final re-use should be as short as practically possible.	Contractor
4.	Where applicable, it is recommended that the cleared grass vegetation containing the existing seedbank be retained and stored in conjunction with topsoil stockpiles. Stockpiles that are to be stored for less than three (3) months should be covered with shade-cloth, Geotech materials or similarly suitable material to prevent erosion, and kept moderately moist in order to maintain the viability of the soil. If stockpiles are to be stored for more than three (3) months, a protective vegetation layer must be established on the topsoil in order to protect it against erosion, dust and desiccation. The stockpile must be kept moist in order to maintain the viability of the seedbank, organic matter and vegetation. Vegetation should not consist of weeds but of indigenous grass cover (sourced from the original stripped grass and/ or a regional plant nursery).	Contractor
5.	Soil erosion on site must be prevented at all times, *i.e.* during and after construction activities [*i.e.* during operations]. Suitable erosion control measures must be implemented in areas sensitive to erosion, such as water supply points and edges of slopes. Erosion prevention / run-off attenuation measures include sand bags, logs, silt fences, stormwater catch-pits, shade nets, rip-rap, stone pitching, brush packing or temporary mulching over denuded areas, as required on a case-by-case basis.	Contractor/ Developer
6.	Constant cognisance of the inherent erosion risk potential of all soil and ground surfaces on the site (particularly when exposed / free of vegetation) must be taken and appropriate control and preventative measure put in place. Both the contractor and developer must take responsibility for the development to conform to all environmental requirements in terms of erosion prevention. Effective rehabilitation of disturbed areas will minimise erosion during both construction and operations.	Contractor/ Developer

6.4.15 Stormwater Management

Action no.	Mitigation Measures and Actions	Responsibility
1.	Detailed plans to control and prevent erosion by stormwater must be agreed between the developer, contractor and ECO prior to the commencement of any works, including site clearance on any portion of the site footprint. To this end, a **stormwater management plan** must be compiled specifying how stormwater infrastructure and measures will be incorporated into the overall planned infrastructure design and layout *i.e.* the buildings, greenhouses and roads.	Contractor, Developer, ECO
2.	Earthworks on sites are to be kept to a minimum. Where any sloped embankments have to be created, stabilisation and erosion control measures must be implemented immediately.	Contractor
3.	No chemicals, fluids or hazardous substances are allowed to enter the stormwater drainage system as these could have a cumulatively detrimental effect on aquatic life in the watercourse on site and in the downstream environment beyond the site footprint. Regular inspections and monitoring around the site footprint, watercourse and the immediate surrounding road/drainage network should be undertaken.	Contractor
4.	No stormwater or wastewater may be directed towards any permanent water body or wetland without the installation of a suitable filtration system to prevent pollution, including silt, from entering such water body.	Contractor
5.	Construction activities should be scheduled to minimise the duration of exposed bare soils on site. The contractor must regularly monitor the site for erosion damage after every rainfall event and rectify / rehabilitate any damage immediately. Construction activity during and after rainfall should cease. Only once the ground surface has dried out sufficiently should scheduled construction activities resume.	Contractor
6.	Run-off generated from cleared and disturbed areas/slopes must be controlled using erosion control and sediment trapping measures like silt fences, sandbags, earthen berms and synthetic logs, particularly on exposed slopes. These control measures must be established at regular intervals perpendicular to the slope to break surface flow energy and reduce erosion as well as trap sediment. Sediment barriers should be regularly maintained, cleared and repaired (where necessary) so as to ensure effective drainage.	Contractor
7.	Any temporary erosion control and sediment trapping measures must only be removed once vegetation cover has successfully re-colonised the disturbed areas post-rehabilitation.	Contractor

6.4.16 Faunal Protection

Action no.	Mitigation Measures and Actions	Responsibility
1.	The site should not be fenced with electric fencing which is near to the ground.	Developer, Contractor
2.	Any fauna directly threatened by the construction activities should be removed to a safe location by the ECO or other suitably qualified person.	Developer, Contractor
3.	The collection, hunting or harvesting of any plants or animals at the site should be strictly forbidden. Personnel should not be allowed to wander off the demarcated construction site.	Contractor
4.	Fires should only be allowed within fire-safe demarcated areas.	Contractor
5.	No fuelwood collection should be allowed on-site.	Contractor
6.	No dogs should be allowed on site.	Contractor
7.	If the site must be lit at night for security purposes, this should be done with low-UV type lights (such as most LEDs), which do not attract insects.	Contractor
8.	All hazardous materials should be stored in the appropriate manner to prevent contamination of the site. Any accidental chemical, fuel and oil spills that occur at the site should be cleaned up in the appropriate manner as related to the nature of the spill.	Developer, Contractor
9.	Staff present during the operational phase should receive environmental education so as to ensure that that no hunting, killing, or harvesting of plants and animals occurs.	Developer, Contractor

6.4.17 Terrestrial biodiversity protection

Action no.	Mitigation Measures and Actions	Responsibility
1.	Removal of indigenous vegetation must be restricted to the immediate area for construction and as instructed by the PM and ECO.	Developer, Contractor
2.	Any protected vegetation species identified by a botanist or ECO may not be removed or cut without a permit from the relevant Conservation Authority. The removal of indigenous/endemic shrubs or forbs must be kept to a minimum and only be removed after a *Search* and *Rescue* has been done and any necessary permits have been obtained (if applicable).	Developer, Contractor
3.	Care must be taken to avoid the introduction of alien plant species to the site and surrounding areas. Where alien plants have been introduced on to the site, they must be removed immediately. Any cleared alien vegetation must be disposed of to a suitable landfill site. Invader species and weeds must be removed and disposed of in accordance with existing legislation (Conservation of Agricultural Resource Act (No. 43 of 1983) on a regular basis.	Contractor
4.	Should the need arise for the open burning of alien vegetation during the site development phase of the project, an open burning permit must be applied for the disposal of alien vegetation. *Alternative means for disposal, where practically possible, must be investigated and implemented prior to considering open burning as a means of disposal of vegetation*	Contractor
5.	The contractor must develop an Action Plan/Method statement for the removal of alien invasive species and submit it to the ECO for approval.	Contractor
6.	No poaching of any animal or harvesting/collecting of any vegetation is permitted and no animal may be killed, destroyed, hunted, trapped, snared or captured for any purpose. The removal of any protected fauna from site or surrounds is strictly prohibited, unless done so for the protection of the species with the applicable permits. Any dangerous animals, such as venomous snakes, should be handled only by a competent person. No killing of any snakes is permitted. By contravening any of these conditions, harsh contractual fines and penalties must be imposed and the immediate dismissal on any contract employee who is found attempting to kill, snare or otherwise harm animals.	Contractor
7.	The speed of vehicles to and around the site should be monitored / limited to avoid potential injuries and killing of fauna, and to allow for sufficient safety margins to avoid collisions.	Whole Project Team
8.	For the prevention of termite damage to infrastructure such as underground cabling the Applicant should consider preventative measures such as the use of physical barriers or suitable chemicals.	Developer, Contractor

6.5 POST-CONSTRUCTION / REHABILITATION PHASE

6.5.1 Site de-establishment

Action no.	Mitigation Measures and Actions	Responsibility
1.	On completion of construction, the contractor shall ensure that all temporary structures, equipment, materials, waste, litter, rubble, notice boards and structures fences used during construction are removed with minimum damage to the surrounding area.	Contractor, ECO, Project Manager
2.	The contractor shall clean and clear the site to the satisfaction of the PM and ECO.	Contractor
3.	After construction completion, any remaining disturbed surfaces on the site footprint shall be rehabilitated by scarifying the surface and rehabilitating the areas according to the EA, EMPr and specialist recommendations.	Contractor

6.5.2 Rehabilitation

Action no.	Mitigation Measures and Actions	Responsibility
1.	A rehabilitation programme should be implemented as soon as practically possible after completion of each main construction activity (once no further disturbances will occur). Locally appropriate indigenous vegetation must be used for the site in accordance to a Rehabilitation Plan/Method Statement.	Developer, Contractor
2	All disturbed surfaces compacted by construction activities should be ripped and scarified to allow organic contaminants to breakdown and to promote vegetation re-establishment.	Contractor
3.	Rehabilitation or re-vegetation of disturbed areas must take place during or immediately after construction is complete once no further disturbances will take place.	Contractor
4.	Only appropriate indigenous vegetation should be used for the rehabilitation and re-vegetation within the disturbed area in accordance to the Rehabilitation Plan.	Contractor
5.	Final rehabilitation must be completed within a period specified by the PM and ECO.	ECO, Developer, Contractor
6.	All disturbed areas must be rehabilitated immediately upon completion of the construction.	Contractor
7.	Rehabilitation efforts must strive to ensure that no visible erosion scars remain after completion of the Contract.	Contractor
8.	Disturbed areas of natural vegetation as well as any cut and fills must be rehabilitated to prevent soil erosion.	Contractor
9.	Ideally, the timeframe for rehabilitation should be planned to coincide with the growing season to allow vegetation to establish successfully.	Contractor
10.	It may be necessary that a botanical/ecological specialist or landscaper be consulted prior to the undertaking of rehabilitation and re-vegetation of all affected areas, as identified by the ECO in consultation with the Project Manager.	Project Manager, ECO
11.	Photos of all affected and rehabilitated areas must be taken *during* and *after* rehabilitation in order to compare with the site condition *pre*-construction i.e. pre-disturbance.	Contractor, ECO
12.	Rehabilitation is to be monitored by the contractor and ECO according to the requirements of the EMPr and specialist recommendations.	Contractor, ECO

6.5.3 Revegetation

Action no.	Mitigation Measures and Actions	Responsibility
1.	Re-vegetation within the development footprint should be monitored for a consecutive period of one year [annual growing season of all seasons] at intervals of 3, 6 and 12 months to ensure that: • Erosion and sedimentation is not taking place and vegetation re-growth is successful; • No alien invasive vegetation is spreading/emerging; • Any additional maintenance activities where intrusive works may be deemed necessary are adhering to the mitigation measures in this EMPr.	Contractor, Developer, ECO
2.	Original topsoil retained and stockpiled during construction should be used during rehabilitation, where applicable.	Contractor
3.	The contractor's Rehabilitation Method Statement should include details of the re-seeding and/or re-vegetation methods to be used for all affected areas where no hard surface infrastructure has been constructed. It may be necessary for the developer/contractor to appoint a suitably experienced landscaping contractor/botanist who is familiar with the local vegetation and rehabilitation methods. Such appointment must first be approved by the PM.	Contractor, ECO, Project Manager, Rehabilitation specialist/ landscaper
4.	It is recommended that as part of the final layout of the development during the operational phase, that as much natural vegetation [soft as opposed to hard surface] is retained/re-instated. Indigenous grass and plant species should be sourced from the original stripped grass on the site footprint and/ or a regional plant nursery.	Contractor, ECO, Project Manager, Rehabilitation specialist/ landscaper
5.	Rehabilitating disturbed areas by collecting seed from plants in the same community in nearby undisturbed vegetation for sowing on disturbed areas maybe also be a possible option. However, advice in this regard should be sought from the regional conservation authority.	Contractor, Developer, ECO

6.5.4 Erosion control measures

Action no.	Mitigation Measures and Actions	Responsibility
1.	Precautions should be taken to prevent soil erosion during the Rehabilitation Phase. Erosion control measures (e.g. application of straw mulches or soil binders to exposed soil) shall be put in place in all rehabilitated areas, including access roads, stockpiles and any other disturbed areas associated with the affected area operations.	Contractor
2.	If necessary, wind protection measures such as shade cloth screens shall be erected to protect the soil and vegetation.	Contractor

6.6 OPERATIONAL PHASE

The functioning and operation of the CEA hydroponics facility is expected to be long-term and fully functional once rehabilitation is complete. This component of the EMPr [*i.e.* operational] aims to provide the facility owner / end-user developer[s] with guidance to ensure that potential negative impacts on the environment associated with the operations of the facility continue to be monitored and minimised. It aims to ensure that infrastructure is operated and maintained according to principles of environmental 'Best Practice'.

It is recommended that an environmental management system [EMS] such as the ISO14001 standard is implemented at the facility for the operational phase.

6.6.1 Protection of ecological systems

Action no.	Mitigation Measures and Actions	Responsibility
1.	Maintain/adhere to 32m protection buffers around freshwater resources [wetland and watercourses].	Owner / End-user developer
2.	Monitor the condition of the site's natural ecosystem [vegetation] on an on-going basis.	Owner / End-user developer
3.	Restrict loss of any natural remaining habitats and establish a flora/fauna management protocol plan to ensure protection and/or safe relocation of animals such as birds, reptiles, bees and any other species which may occur or be found, permanently or intermittently, on the facility's footprint.	Owner / End-user developer

6.6.2 Vegetation management

Action no.	Mitigation Measures and Actions	Responsibility
1.	Avoid encroachment of alien and invasive plant species. If necessary, an alien plant monitoring and eradication programme must be implemented.	Owner / End-user developer
2.	Restrict losses of natural remaining vegetated footprints. Ensure rehabilitation efforts after construction have been successful to areas surrounding the development footprint and where necessary, re-instate vegetation and / or rehabilitate areas again.	Owner / End-user developer
3.	Appoint trained ground-staff to maintain vegetation around the facility.	Owner / End-user developer

6.6.3 Fire management

Action no.	Mitigation Measures and Actions	Responsibility
1.	Ensure that appropriate communication channels are established to be implemented in the event of a fire. Implement a fire management plan.	Owner / End-user developer
2.	Provide adequate fire-fighting equipment at the facility.	Owner / End-user developer
3.	Train internal staff and/or use external fire-fighting service-providers during operations.	Owner / End-user developer
4.	Contact details of emergency services should be prominently displayed.	Owner / End-user developer
5.	Fire breaks should be established where and when required. Cognisance must be taken of the relevant legislation when planning and burning firebreaks.	Owner / End-user developer

6.6.4 Waste management

I.e., wastewater, solid waste, hazardous waste, recycling

Action no.	Mitigation Measures and Actions	Responsibility
1.	Implement an integrated waste and water management plan [IWWMP].	Owner / End-user developer
2.	Litter and general waste materials must be disposed of into pest/scavenger- and weather-proof bins.	Owner / End-user developer
3.	Consideration of a recycling programme is strongly recommended where a number of bins are marked differently according to the category of waste being recycled (e.g. paper, metals, plastics, glass, batteries, printer cartridges, timber, etc.)	Owner / End-user developer
4.	As far as possible, any organic, biodegradable and non-toxic wastes e.g. vegetable/plant matter, soils, grass, wood chips, etc should be composted turned into manure for re-cycling on site.	Owner / End-user developer
5.	Waste management and disposal should conform to that of the norms, standards and by-law of the Local Municipality as well as the NEM: WA. Disposal of waste must be in accordance with relevant legislative requirements.	Owner / End-user developer
6.	Avoid and/or minimise the use of plastics and other non-recyclable materials during operations during all phases of production to delivery of final products.	Owner / End-user developer

6.6.5 Environmental awareness

Action no.	Mitigation Measures and Actions	Responsibility
1.	Formalise worker/ employee environmental awareness programmes on a regular basis.	Owner / End-user developer

6.6.6 Stormwater and Erosion

Action no.	Mitigation Measures and Actions	Responsibility
1.	Stormwater discharge points must be protected against erosion and not allowed to concentrate directly into and initiate erosion in the watercourse. Stormwater run-off from created 'hard surfaces' should be diverted / dissipated into vegetated terrestrial surfaces to allow even infiltration into the surrounding ground surfaces.	Owner / End-user developer
2.	Develop a Stormwater Management Plan for operational infrastructure or modify/amend the construction Stormwater Management Plan.	Owner / End-user developer
3.	Maintain [and repair where necessary] any permanent erosion control measures implemented during the construction phase. Also maintain any temporary erosion control measures for as long after construction as practically possible (*i.e.* run-off attenuation on slopes, sand bags, logs, silt fences, stormwater catch-pits, and shade nets).	Owner / End-user developer

6.6.7 Vehicle movements/traffic

E.g., deliveries, packaging, offloading, repairs, etc

Action no.	Mitigation Measures and Actions	Responsibility
1.	Vehicle movements must be restricted to the designated roadways.	Owner / End-user developer
2.	Operational activities likely to generate the most noise, *i.e.* vehicle deliveries to and from the facility should be restricted to normal working hours.	Owner / End-user developer

6.6.8 Electricity use

Action no.	Mitigation Measures and Actions	Responsibility
1.	Minimise electricity use as far as possible e.g. use light efficient technologies and using renewable energy sources as far as practically possible.	Owner / End-user developer

6.6.9 Water use

Action no.	Mitigation Measures and Actions	Responsibility
1.	Conserve water and minimise use as far as possible e.g. minimising water use during cleaning of any equipment at the facility.	Owner / End-user developer
2.	Immediately repair any dripping or leaking taps, water connections and infrastructure.	Owner / End-user developer
3.	Include as a topic of discussion water usage and conservation during environmental awareness training.	Owner / End-user developer
4.	Undertake systematic audits [e.g. LCA] related the efficiency of the facility's water system/infrastructure.	Owner / End-user developer

6.6.10 Hazardous Substances/Chemical use

Action no.	Mitigation Measures and Actions	Responsibility
1.	Where applicable, adhere to and implement the actions as listed under the construction phase section of this EMPr [see section 6.4.6].	Owner / End-user developer
2	The use of insecticides and/or other harmful agricultural chemicals must be managed responsibly and those handling it must wear the appropriate protective clothing and equipment.	Owner / End-user developer
3	Agricultural chemicals must be stored in a demarcated area that is bunded and on an impervious surface that will prevent the infiltration of any spills into soils. The area must be clearly marked with the proper warning signage.	Owner / End-user developer
4	Access to the storage area must be strictly controlled with only authorised personnel having access.	Owner / End-user developer
5	No agricultural chemicals or empty containers may be disposed of to the environment. The disposal of any hazardous agricultural chemicals must be in accordance with the policies and procedures of the Department of Agriculture.	Owner / End-user developer

6.6.11 Spills, Incidents and Pollution Control

Action no.	Mitigation Measures and Actions	Responsibility
1.	Where applicable, adhere to and implement the actions as listed under the construction phase section of this EMPr [see section 6.4.7].	Owner / End-user developer

6.6.12 Emergency Preparedness

Action no.	Mitigation Measures and Actions	Responsibility
1.	An Emergency Preparedness Plan, emphasising fire prevention, should be drafted before construction commences. Fire outbreaks pose a major risk to human life, property and vegetation in the surrounding area. Provision must be made to ensure preparedness toward preventing fires caused by construction activity or elsewhere to limit or prevent damage to surrounding areas. The plan must specify how fires will be prevented from breaking out causing damage to any surrounding areas during construction. Contact numbers for any local fire associations and/or fire-fighting authorities should be included.	Owner / End-user developer
2.	Training for emergency preparedness and potential emergency situations [*i.e.* fire outbreaks, floods, explosions, accidents, first aid, evacuations, snake bites, etc.] should be included in a Health and Safety plan for the development.	Owner / End-user developer

6.6.13 Air quality

I.e., noise and dust.

Action no.	Mitigation Measures and Actions	Responsibility
1.	Roads must be maintained to a manner that will ensure that nuisance to the community from dust is not visibly excessive.	Owner / End-user developer
2.	Excessive speed of vehicles must be restricted as defined by a health and safety policy.	Owner / End-user developer
3.	Vehicles and equipment must be maintained in a road-worthy condition at all times.	Owner / End-user developer
4.	Where applicable, appropriate dust suppressants with high moisture retention properties should be applied to any gravel roads as required minimise/control airborne dust.	Owner / End-user developer
5.	Operational activities likely to generate the most noise, *i.e.* vehicle deliveries to and from the facility should be restricted to normal working hours.	Owner / End-user developer

6.6.14 Complaints

Action no.	Mitigation Measures and Actions	Responsibility
1.	Maintain a Complaints Register at the facility.	Owner / End-user developer

6.6.15 Maintenance and efficiency of infrastructure

Action no.	Mitigation Measures and Actions	Responsibility
1.	Develop an operational management plan with forecasted budgetary/financial provisions to ensure the upkeep, maintenance and sustained performance [*i.e.* outputs and products] at the facility.	Owner / End-user developer

7 CONFORMANCE WITH THE ENVIRONMENTAL SPECIFICATIONS

It is necessary for both the **developer** and **contractor** to make provisions as part of their budgets for the implementation of the EMPr. In terms of NEMA, every person who causes, has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm to the environment is authorised by law or cannot reasonably be avoided or stopped, to minimise and rectify such pollution or degradation of the environment and is liable to pay costs both to the environment and human health and the preventative measures to reduce or prevent additional pollution and/or environmental damage from occurring. This is referred to as the Polluter Pays Principle. Section 28 of NEMA embodies the Polluter Pays Principle.

During **construction**, the developer (holder of the EA) and/or the contractor will be deemed not to have adhered with the Environmental Specifications/EMPr/EA if:

- Any unauthorised construction activities or unauthorised NEMA EIA listed activities knowingly take place in the context of those activities that are authorised for the Project.

During **construction**, the contractor is deemed not to have adhered with the Environmental Specifications/EA/EMPr if:

- There is evidence of contravention of clauses within and beyond the boundaries of the site footprint.
- Significant environmental damage is caused due to negligence.
- There is failure or ignorance to comply with corrective or other instructions issued by the PM or ECO within a specified time; and
- There is failure to respond to and adequately resolve reasonable complaints from members of the public or project stakeholders.

During **operations**, the developer is deemed not to have adhered with the Environmental Specifications/EA/EMPr if:

- Any unauthorised construction activities or unauthorised NEMA EIA listed activities knowingly take place in the context of those activities that are authorised for the development.
- There is evidence of environmental contravention within and beyond the boundaries of the development footprint.
- Significant environmental damage is caused due to negligence.

7.1 Non-Conformance

During construction, the contractor shall act immediately when any notice of non-conformance (NCR) is received and correct whatever is the cause for the issuing of the notice. Complaints received regarding activities on the construction site pertaining to the environment shall be recorded in a dedicated register and the response noted with the date and any actions of resolution taken. The ECO should be made aware of any complaints received.

Any non-conformance to the procedures of this EMPr may also be deemed a transgression of the various statutes and laws that define the manner in which the biophysical (natural) and socio-economic environment is managed. Any chronic or persistent negligence or failure to redress serious transgressions or contraventions shall be reported to the relevant authority for them to consider, mediate and officially advise upon on a basis that the authority deems to be environmentally fair, reasonable and justifiable.

It is recommended that the inclusion of a penalty clause in the contract documentation is implemented for incidents of major legal non-compliance or persistent negligence which significantly negatively impacts the environment. The contractor will be allowed one offence and a written warning issued by the ECO or PM. Failure to rectify the offence within two (2) working weeks of the issue of the warning or a repeat offence should result in a fine, as decided by the PM or ECO. The principle of any fines or penalties should be consistent with any clauses in the contractual documentation for the construction phase where fines or penalties may be issued to the contractor for any time delays/extensions or material or workmanship defects relating to the Project which are not allowed for in the contract and the associated budget.

It is recommended that the PM in collaboration with the ECO implement an integrated system of financial penalties and/or conditions for dismissal for less serious transgressions, and any others determined during the course of the construction phase, such as those listed below:

- Theft/removal and/or damage to any fauna, flora or cultural or heritage objects on site.
- Any persons, vehicles or equipment found within any of the designated “no-go” areas.
- Littering on site.
- Unlawful lighting of fires on site.
- Persistent or un-repaired fuel and oil leaks.
- Excess dust or excess noise emanating from site.
- Possession or use of intoxicating substances on site.
- Any vehicles being driven in excess of designated speed limits.
- Urination and defecation anywhere except at designated facilities.

It is recommended that any financial penalties are channelled to a local conservation fund or equivalent fund.

ANNEXURES

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Annexure A: Curriculum Vitae of Author

Nick Gates

Senior Environmental Consultant

Profession

Senior Environmental Consultant & Senior Manager

Qualification

BSocSci: Environmental and Geographical Sciences

- *University of Cape Town, 2007*

Short courses

SHEQ IMS Auditors Course

- *ISTEC Training, 2017*

Environmental Risk Assessment and Management based on ISO 31000 (NQF 6)

- *Centre for Environmental Management, 2014*

Project Management (NQF 8)

- *University of Stellenbosch Business School, 2014*

Integrated Water Resource Management in the Context of South African Legislation (NQF 7)

- *Centre for Environmental Management, 2011*

Basic GIS Training

- *Geocline , 2010*

Environmental Law (NQF 7)

- *Centre for Environmental Management, 2010*

Lead Auditing Course

- *DSQ, 2010*

Registration Bodies

- The Institute of Waste Management of South Africa: Registration No. 30116139
- International Association of Impact Assessment South Africa: Registration No. 5535
- Environmental Law Association: Registration No. 2018/198/WC

Years of Experience

- *14 years*

Key skills

Consulting, Project Management, Conflict Management, Problem Solving, Programme Implementation, Environmental compliance monitoring and implementation

Personal Details

- Gender: Male
- Date of Birth: 1983-07-31
- Nationality: South African
- Identity: 830102 5146 080
- Marital Status: Married
- Drivers Licence: Code B
- Languages: English

NCC Environmental Services (Pty) Ltd

2020 -Present

Service Line Manager: Environmental Consultant

2008 - 2020

Senior Environmental Consultant specializing in Water Use License Applications and Auditing

Current Duties

Project Manager of Legal Compliance Projects: Applying for various environmentally related licences, permits and authorizations; source, co-ordinate and manage specialist processes. Liaising with various Government Environmental Departments to meet minimum requirements of licenses. Liaising with clients to improve and speed up the application process.

Undertaking of various environmental compliance monitoring and implementation functions on various sites such as Environmental Control Officer, Environmental Manager, Auditor, compilation of Operational & Environmental Management Plans and Environmental Officer on a variety project mentioned below.

Projects

Auditing:

- Lead Auditor for Section 30A legal compliance audit for Saldanha Bay Municipality
- Lead Auditor for external legal compliance audits for Cape Agulhas Municipality Landfill and three drop off facilities
- Lead Auditor for external legal compliance audits for 14 City of Cape Town Drop Off Facilities
- Lead Auditor for external legal compliance audit of PetroSA's Waste Management Mossel Bay.
- Lead Auditor for external legal compliance audit of Saldanha Bay Municipality Vredenburg and Langebaan Landfills.
- Lead Auditor for external legal compliance audit of PetroSA's Voorbaai Water Use Licence
- Lead auditor for external legal compliance audit of Longyuan Mulilo De Aar Wind Facility operations
- Lead auditor for external legal compliance audit of Mulilo Sonnedix Prieska Photovoltaic Facility operations and Equator Principle Audit
- Lead auditor for external legal compliance audit of Exxaro's Grootegeluk Mine, various facilities.
- Polyoak Water Audit, Polyoak operating Facility
- Seaharvest Section 30A Audit, Seaharvest Saldanha Bay

Compliance Monitoring Projects (ECO/EO):

- KIPTS Project, Koeberg ESKOM
- Kusile Power Station EO, ESKOM
- SmartMatta Recycling Facility ECO, Smartmatta
- Saint Helena Airport Project ESO, Basil Read
- Mouille Point Sea Wall ECO, Ingerop Africa
- Mulilo Prieska Photovoltaic Facilities ECO, Mulilo
- Hydra Gamma 765kV ECO, ESKOM
- Medupi Spitskop 400kV, ESKOM
- Sishen South (Kolomela) Mining Project ECO, Kumba Iron Ore
- Vergelegen Erosion Rehabilitation Project ECO, Vergelegen Wine Estate
- WBHO Turbine Tower Facility ECO, Prieska, WBHO

Annexure B: Content of an EMPr

CONTENT OF AN EMPr[1]

[1]The content of this EMPr for is consistent with the requirements as set out in Section 19 (4) of the 2014 NEMA EIA Regulations [as amended] in terms of Appendix 4 of GN R982.

NEMA requirements [Sec 24N] for EMPrs		
Appendix 4 clause	**Content as required by NEMA**	**EMPr Section**
1[a]	(i) details of the EAP who prepared the EMPr; and	Sec 1.3 & Annexure A
	(ii) details of the expertise of that EAP to prepare an EMPr, including a curriculum vitae;	
1[b]	a detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description;	Sec 3 & 4
1[c]	a map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that any areas that should be avoided, including buffers;	Sec 3
1[d]	a description of the impact management objectives, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including -	As below:
	(i) planning and design;	Sec 6.2
	(ii) pre-construction activities;	Sec 6.3
	(iii) construction activities;	Sec 6.4
	(iv) rehabilitation of the environment after construction and where applicable post closure; and	Sec 6.5
	(v) where relevant, operation activities;	Sec 6.6
1[e]	a description and identification of impact management outcomes required for the aspects contemplated in paragraph (d);	Sec 6
1[f]	a description of proposed impact management actions, identifying the manner in which the impact management objectives and outcomes contemplated in paragraphs (d) and (e) will be achieved, and must, where applicable, include actions to -	As below:
	(i) avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;	Sec 6
	(ii) comply with any prescribed environmental management standards or practices;	Sec 6
	(iii) comply with any applicable provisions of the Act regarding closure, where applicable; and	Sec 6
	(iv) comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable;	Sec 6
1[g]	the method of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Sec 5, 6
1[h]	the frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Sec 5, 6
1[i]	an indication of the persons who will be responsible for the implementation of the impact management actions;	Sec 5, 6
1[j]	the time periods within which the impact management actions contemplated in paragraph (f) must be implemented;	Sec 5, 6
1[k]	the mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);	Sec 5, 6
1[l]	a program for reporting on compliance, taking into account the requirements as prescribed by the Regulations;	Sec 5
1[m]	an environmental awareness plan describing the manner in which –	As below:
	(i) the applicant intends to inform his or her employees of any environmental risk which may result from their work; and	Sec 6, Annexure D & G
	(ii) risks must be dealt with in order to avoid pollution or the degradation of the environment; and	
1[n]	any specific information that may be required by the competent authority.	EA Pending
2	Where a government notice gazetted by the Minister provides for a generic EMPr, such generic EMPr as indicated in such notice will apply.	N/A

Annexure C: Maps

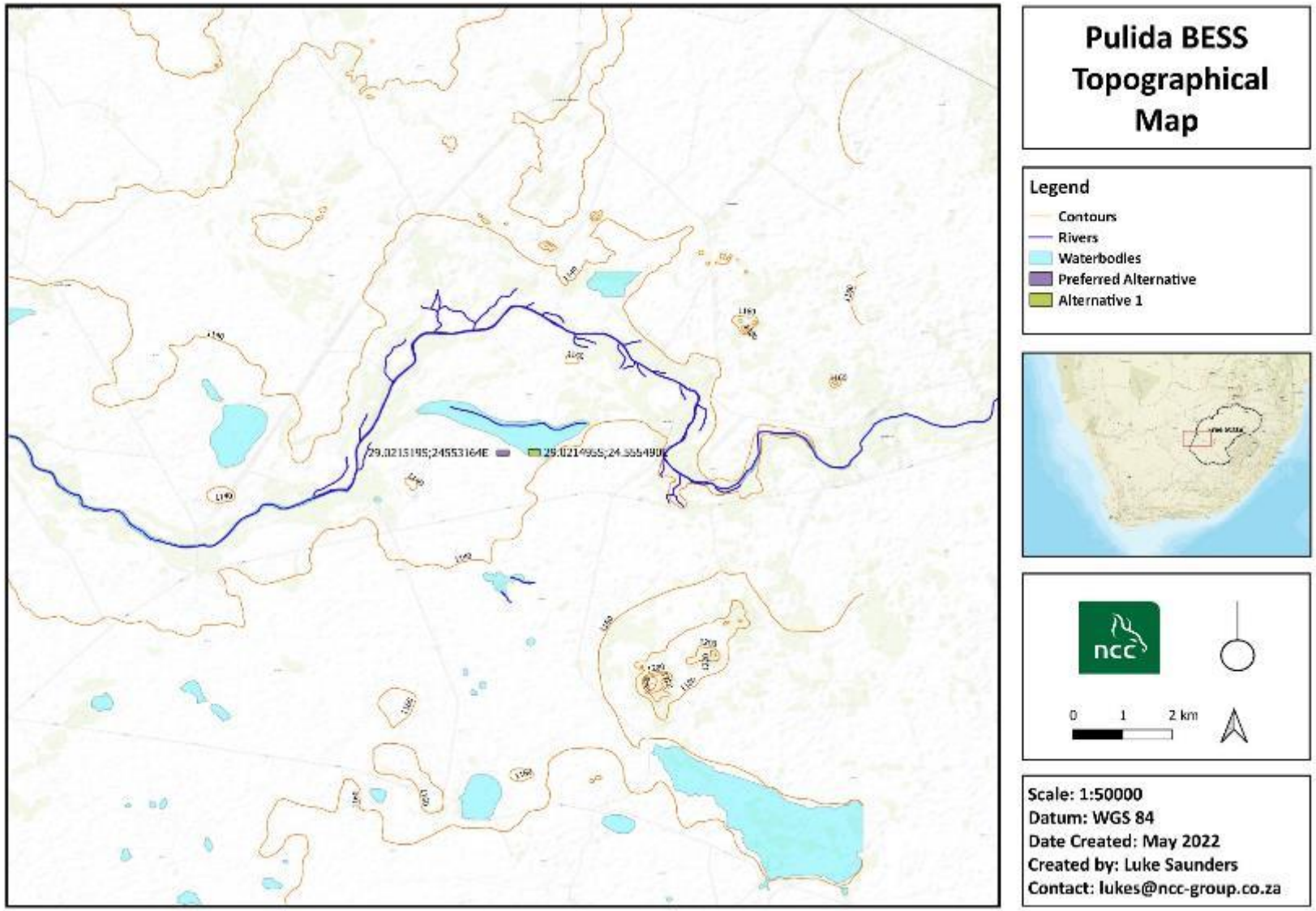

Figure C1: Topographical survey map

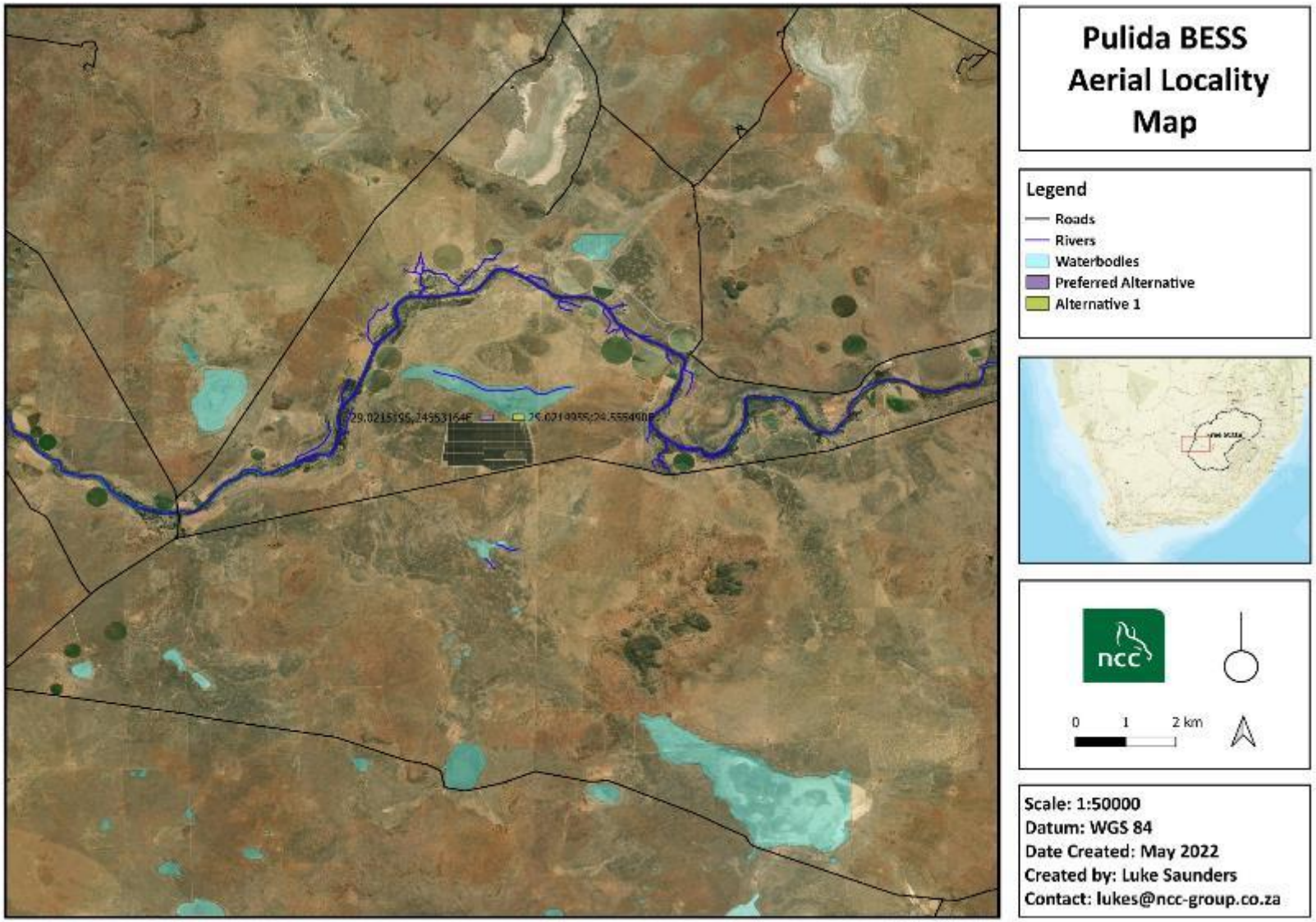

Figure C2: Aerial map

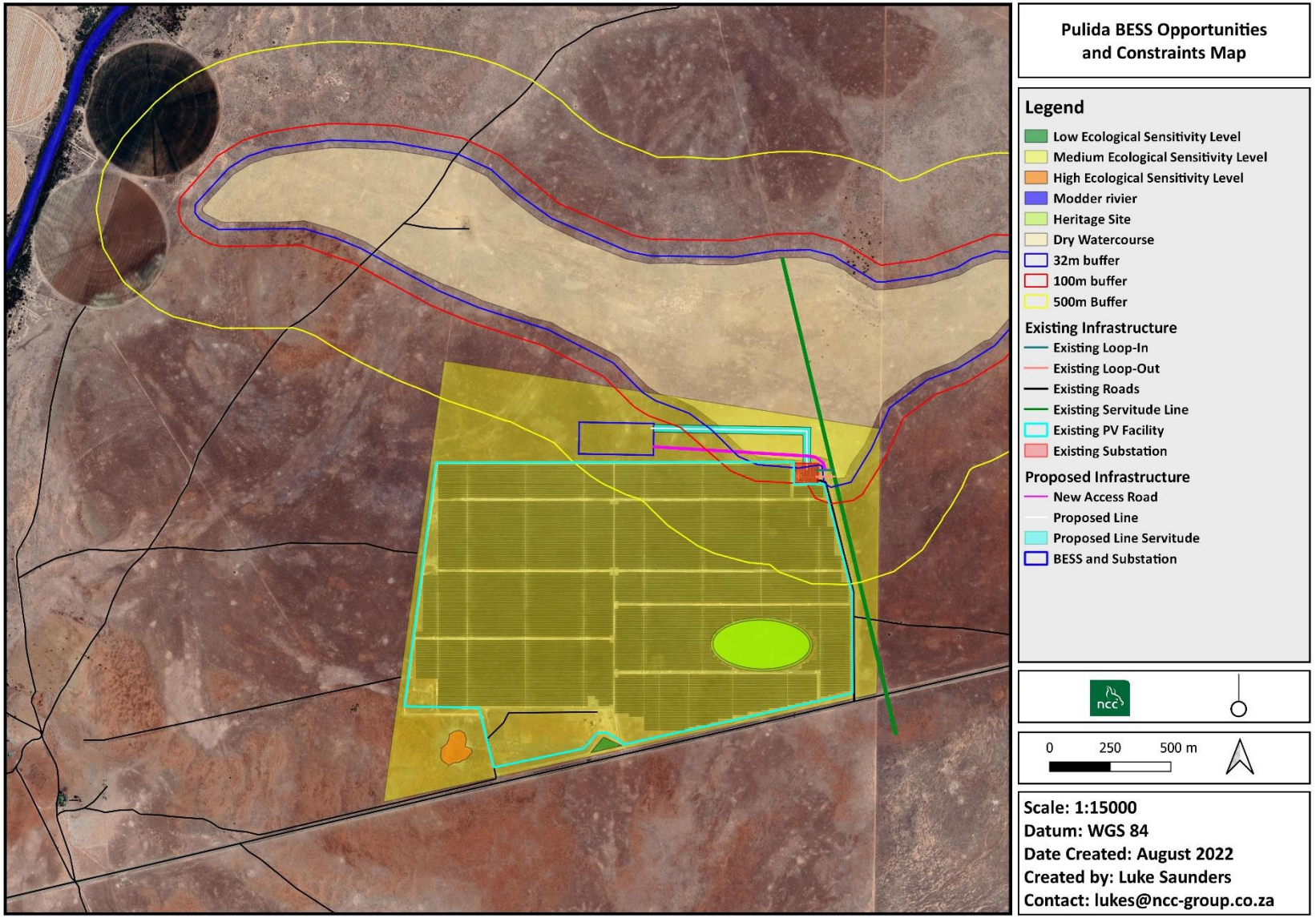

Figure C3: Opportunities and Constraints Map (Option A – Substation to Substation)

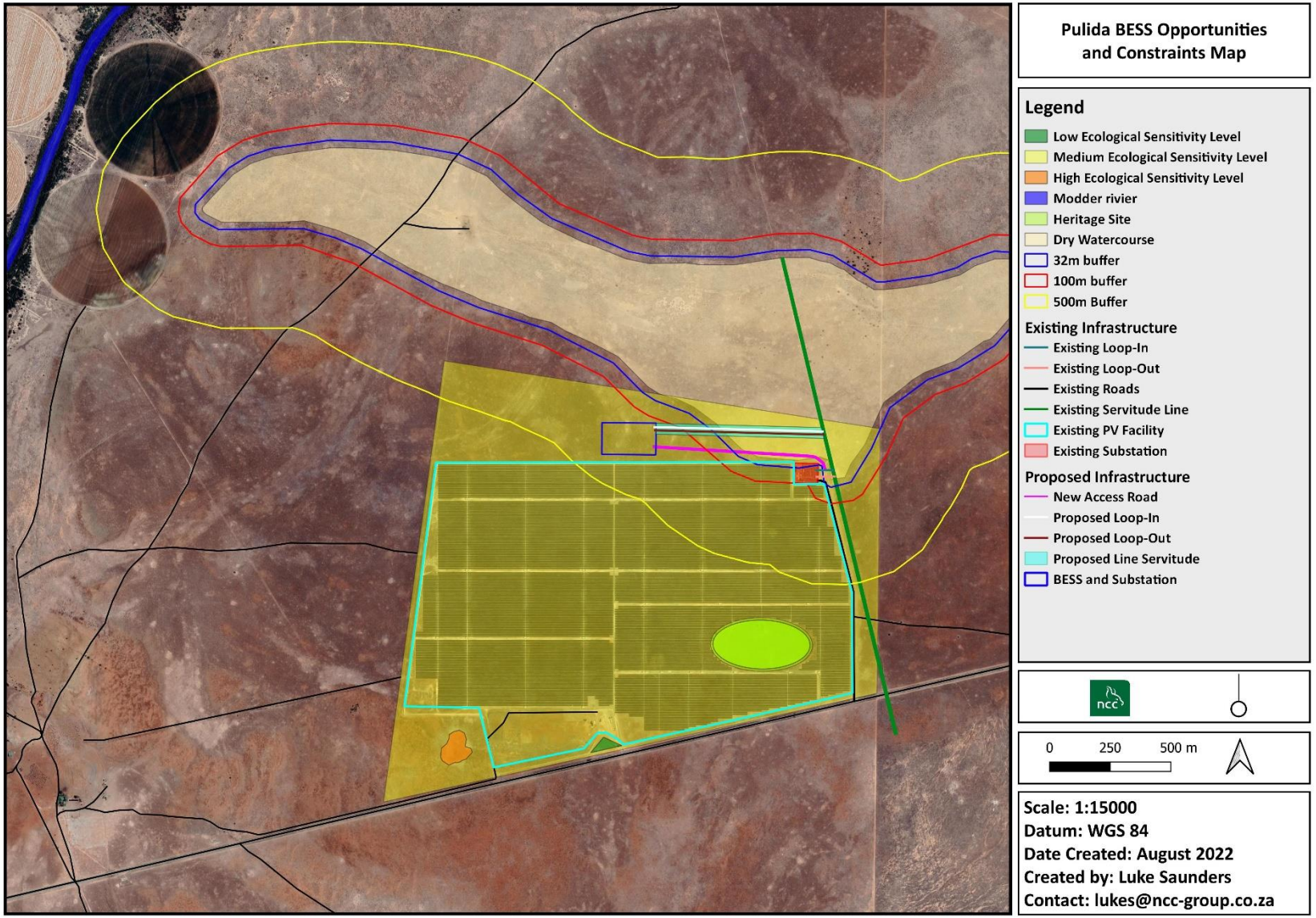

Figure C4: Opportunities and Constraints Map (Option B – Loop In & Loop Out)

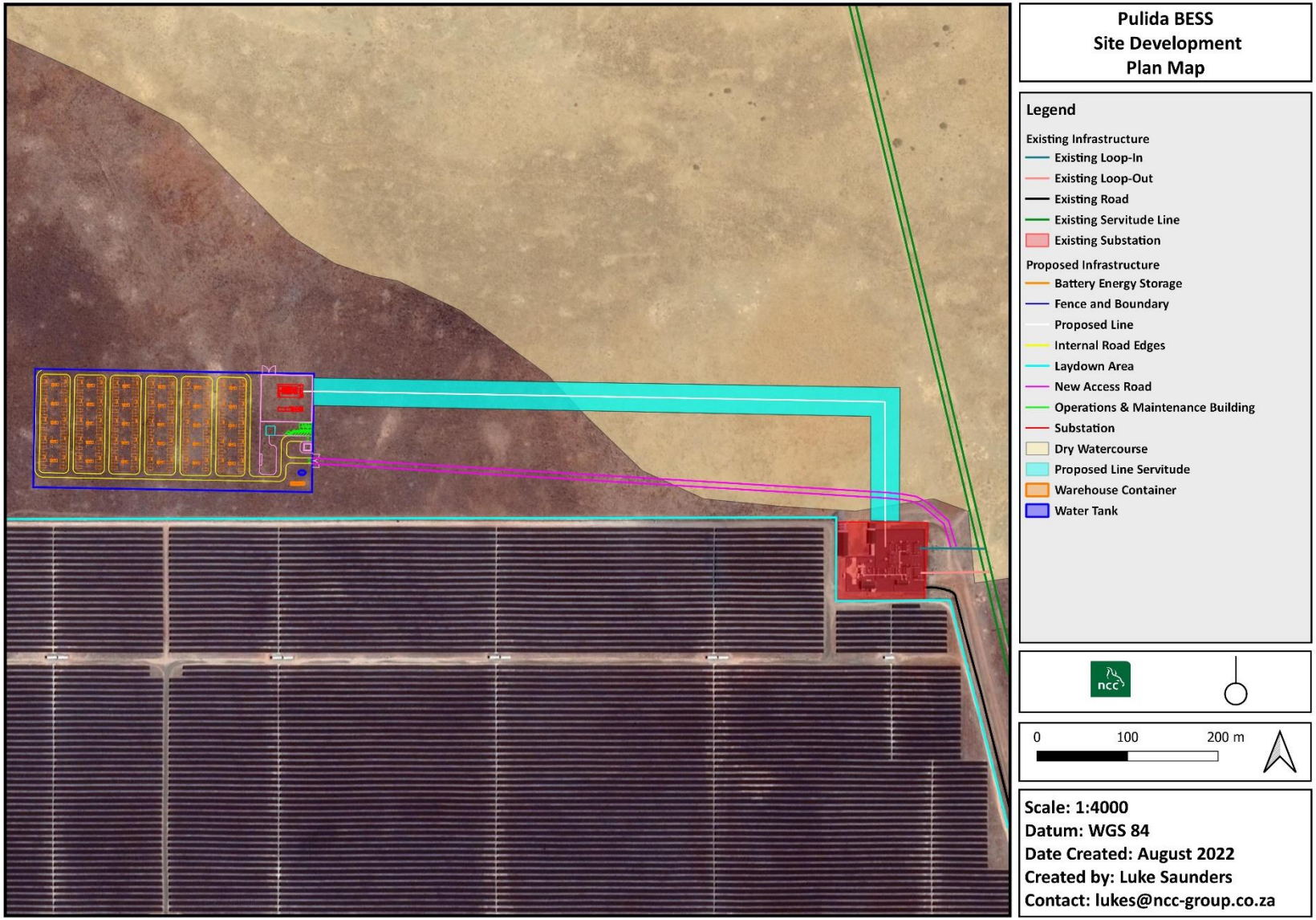

Figure C5: Site Development Plan (Option A – Substation to Substation)

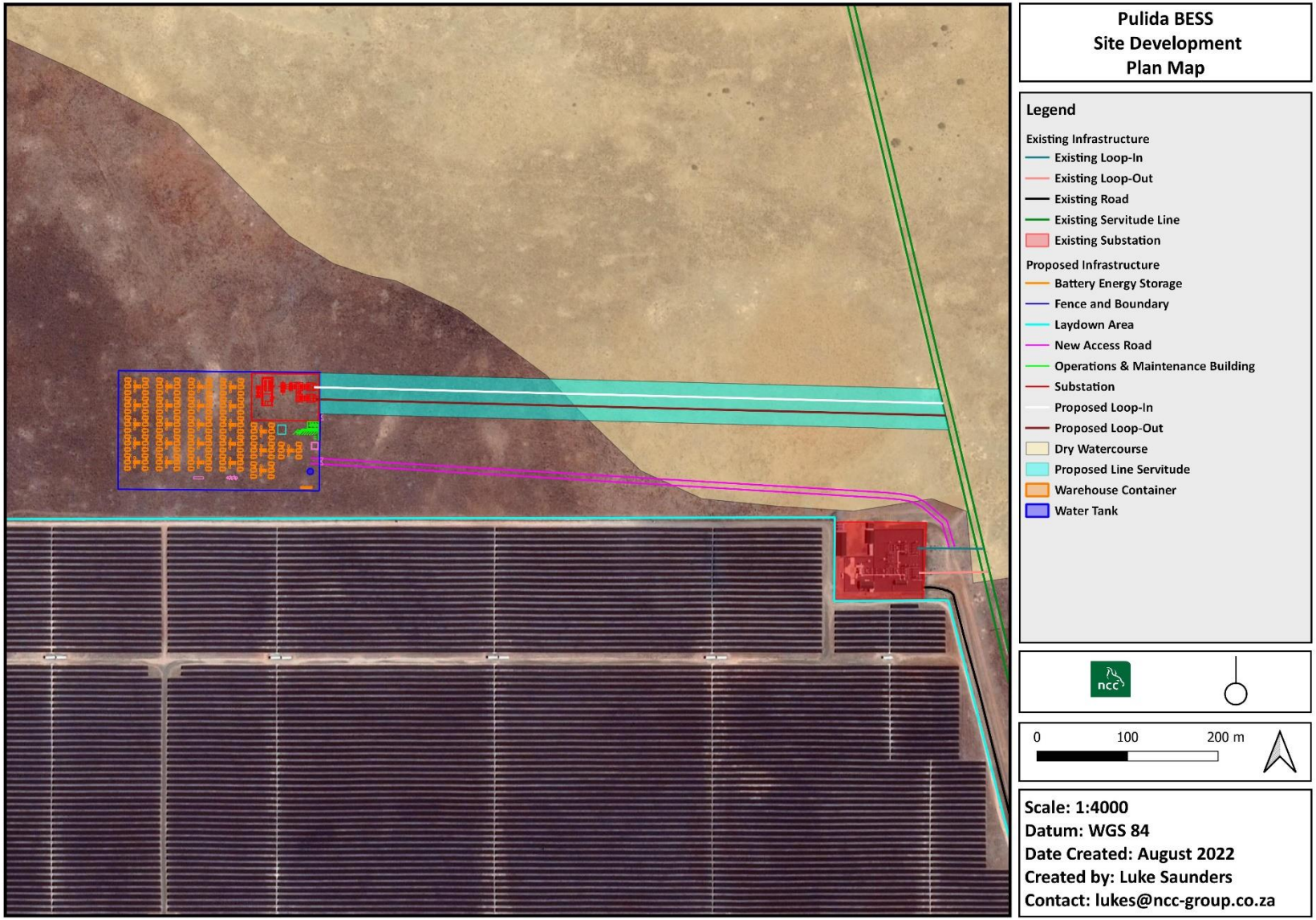

Figure C6: Site Development Plan (Option B – Loop In & Loop Out)

Annexure D: Awareness Training

Basic Environmental Awareness Training

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

Do not harm any animals on the site.
Report any animals on site to the site manager.

Report any petrol, oil & diesel leaks or spills to the Site Supervisor.
Use a drip tray under vehicles & machinery during refueling.

Put cigarette butts in designated bin.
Do not smoke near gas, paints or petrol.
Do not throw cigarettes into veld.

Know all the emergency phone numbers.

Do not light any fires.
Know the positions of fire fighting equipment.
Report all fires to the site supervisor.
Do not burn rubbish/vegetation.

Avoid producing dust – keep to speed limit.

Use the toilets provided.
Report full or leaking toilets to site supervisor.

Do not make loud noises around the site, especially near homes/business.
No employees to be using headphones/earphones on site.
Report noisy vehicles or machinery to the site supervisor.

Do not litter – put all rubbish into the bins provided.
Report full bins to site supervisor.

Always keep to the speed limit.
Drivers - check & report leaks.
Ensure loads are secure & do not spill.
NO vehicle/machinery washing is permitted.

Do not damage or cut down any trees or plants without the necessary permissions.
Do not pick flowers.

All employees entering site must have appropriate Personal Protective Equipment (PPE) on them at all times.

Report any breaks, floods, fires, leaks and injuries to the site supervisor.
Ask questions!

Annexure E: Environmental Registers

WASTE REGISTER TEMPLATE																								
Waste streams		Contractor	Service provider	Recycled / Recovered Waste								General Waste Disposed		Hazardous Waste Disposed							Comments	Collection slip received	Disposal slip received	Date Filed
Week	Slip date			Paper	Cardboard	Plastic	Scrap metal	Wood	Rubble	Printer Cartridges	Recycled Oil	General Waste	Clean cement bags	Sewage: Mobile toilets	Sewage: Conservancy tank	Chemical Waste	Oil Contaminated Waste		Sanitary Waste	Medical Waste				
				kg	kg	kg	kg	kg	m3	units	Litres	kg	kg	litres	litres	litres	litres	kg	kg	kg				

WATER USAGE TEMPLATE									
Date/ Week	Water source		Water Used on site (Weekly)			Water figures (Monthly)			Comments
	Water collected at *source	Grey/ treated water	Dust suppression	Civils works	Potable water/ Offices	Monthly Abstraction	Monthly Total Used	Monthly Total Stored	
	Litres	Litres	Litres	Litres	Litres	Litres	Litres	Litres	

ENVIRONMENTAL INCIDENT / SPILL / NCR REGISTER TEMPLATE																
No.	**Date**	**Source/ Originator**	**Responsible party / Contractor**	**Type**	**Impact**	**Location**	**Estimated volume of spill**	**Significance Classification**	**Repeated Offence**	**Description of Incident**	**Cause**	**Remedial Action**		**Action Date**	**Status**	**Escalated to NCR**
								Minor/ Moderate/ Major		What, Where, When, How, Why did it happen?		Immediate Corrective Actions	Preventative measures			
1																
2																
3																
4																
5																
6																
7																
8																
9																
10																

COMPLAINTS REGISTER TEMPLATE										
Ref No.	Notification Date	Category	Compliment, complaint or issue identified	Source of the issue	Significance of issue	Mitigation Measures		Lessons Learned	Response to initiator	Closure Status
						Corrective action	Preventive action	New or Additional controls required		

Annexure F: EMPr Acceptance

LETTER OF ACCEPTANCE OF THE EMPr – CONSTRUCTION

This letter is to be signed by the developer/infrastructure owner, ECO, principal contractor and project manager / agent / engineer, printed and kept on site.

Acceptance of the Environmental Management Programme			
Dear Sir/Madam, This is to state that the undersigned have received a copy of the approved Environmental Management Programme (EMPr) developed for the Pulida BESS Facility by NCC Environmental Services (Pty) Ltd dated _____. The undersigned parties hereby agree to implement and abide by the conditions and environmental specifications of the EMPr. Any contraventions of the EMPr should be recorded and appropriate corrective actions duly carried out. Any suggested amendments and/or changes to the EMPr should be motivated and approved by the appointed Environmental Control Officer (ECO) in conjunction with the relevant authority. Any such changes are to strictly be made in writing in terms of Chapter 5 of the 2014 NEMA EIA Regulations (as amended).			
As Agreed on this day _____of_____(Month)_____(Year)			
Environmental Control Officer (ECO)			
Name		**Date**	
Signature			
Principal Contractor			
Name		**Date**	
Signature			
Site Engineer/Agent/Project Manager			
Name		**Date**	
Signature			
Developer/Client			
Name		**Date**	
Signature			

LETTER OF ACCEPTANCE OF THE EMPr – OPERATIONS

This letter is to be signed by the developer/infrastructure owner and where applicable, any other operational end-users at the facility, printed and maintained at the facility.

Acceptance of the Environmental Management Programme			
Dear Sir/Madam, This is to state that the undersigned have received a copy of the approved Environmental Management Programme (EMPr) developed for the Pulida BESS by NCC Environmental Services (Pty) Ltd dated _____. The undersigned parties hereby agree to implement and abide by the conditions and environmental specifications of the EMPr. Any contraventions of the EMPr should be recorded and appropriate corrective actions duly carried out. Any suggested amendments and/or changes to the EMPr should be motivated and approved by the relevant environmental authority. Any such changes are to strictly be made in writing in terms of Chapter 5 of the 2014 NEMA EIA Regulations (as amended).			
As Agreed on this day _____of_____(Month)_____(Year)			
Developer/Infrastructure owner			
Name		**Date**	
Signature			
End-user operations contractor [if applicable]			
Name		**Date**	
Signature			
End-user operations contractor [if applicable]			
Name		**Date**	
Signature			

Annexure G: Method Statement Guideline and Basic Template

GUIDELINE FOR METHOD STATEMENTS

Environmental method statements must be prepared by the Developer/Agent/Contractor and submitted to and approved by the ECO and Project Manager and updated/revised as may be necessary. Environmental method statements must contain minimum information on the following basic aspects:

- **Title** - a title of the activity relating to method.
- **Activity Description** - a brief description of the specific activity.
- **Location** - a brief description of the location of the activity.
- **Specifications** - referencing relevant documents such as South African Bureau of Standards, the EMPr, the Environmental Authorisation, Legislation, etc.
- **Drawings** - where relevant.
- **Major Equipment** - listing the major equipment that will be involved in the specific construction or operational activity.
- **Timeframe/Programme** - identifying when the activity is expected to take place.
- **Method** - detailing the method and sequence that will be followed.
- **Resources** - resources that will be required for the activity.
- **Environmental** - information regarding awareness, training, precautions, etc., and
- **Declarations** - signatures of approval of method statements by relevant project role-players.

Example layout for 'Declarations' shown below:

1) PROJECT MANAGER / ENGINEER
The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

_____ _____
(Signed) (Print name)

Dated: _____

2) ECO
The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

_____ _____
(Signed) (Print name)

Dated: _____

3) 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 and with approval by the Engineer, and that the SHE Coordinator, Construction Manager and ECO will audit my compliance with the contents of this Method Statement:

_____ _____
(Signed) (Print name)

Dated: _____

BASIC METHOD STATEMENT EXAMPLE TEMPLATE

METHOD STATEMENT TEMPLATE

CONTRACT: _____

DATE: _____

PROPOSED ACTIVITY (give title of method statement and reference number from the EMPR):

WHAT WORK IS TO BE UNDERTAKEN (give a brief description of the works):

WHERE ARE THE WORKS TO BE UNDERTAKEN (where possible, provide an annotated plan and a full description of the extent of the works):

START AND END DATE OF THE WORKS FOR WHICH THE METHOD STATEMENT IS REQUIRED:

Start Date: _____

End Date: _____

HOW ARE THE WORKS TO BE UNDERTAKEN (provide as much detail as possible, including annotated maps and plans where possible):
