ENVIRONMENTAL IMPACT ASSESSMENT REPORT

EIA Report for the proposed development of the Vhuvhili Solar Photovoltaic (PV) Facility near Secunda in the Mpumalanga Province

PART A: MAIN REPORT

ENERTRAG

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DRAFT ENVIRONMENTAL IMPACT ASSESSMENT REPORT

Draft EIA Report for the proposed development of the Vhuvhili Solar Photovoltaic (PV) Facility near Secunda in the Mpumalanga Province

Prepared by:
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South Africa

Prepared for:
Vhuvhili Solar (RF) (Pty) Ltd

November 2022

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SCOPING AND ENVIRONMENTAL IMPACT ASSESSMENT

for the Proposed Development of the Vhuvhili Solar Photovoltaic (PV) Energy Facility and associated infrastructure near Secunda in the Mpumalanga Province

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT REPORT

November 2022

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REPORT DETAILS

Title:	**Scoping and Environmental Impact Assessment (S&EIA) for the proposed development of the Vhuvhili Solar Photovoltaic Energy Facility and associated infrastructure near Secunda in the Mpumalanga Province: DRAFT ENVIRONMENTAL IMPACT ASSESSMENT REPORT**
Prepared for:	The purpose of this Draft Environmental Impact Assessment Report (Draft EIA Report) is to: • Present the details of and need for the proposed project; • Describe the affected environment, including the planning context, at a sufficient level of detail to facilitate informed decision-making; • Provide an overview of the EIA Process being followed, including public consultation; • Assess the predicted positive and negative impacts of the project on the environment; • Provide recommendations to avoid or mitigate negative impacts and to enhance the positive benefits of the project; and • Provide an Environmental Management Programme (EMPr) for the design, construction and operational phases of the project. The Draft EIA Report is now available to all Interested and Affected Parties (I&APs), Organs of State and stakeholders for a 30-day review period extending from 14 November to 14 December 2022. All comments submitted during the 30-day review period will be incorporated in a detailed Comments and Responses Report, and addressed, as applicable and where relevant, and included in the Final EIA Report. The Final EIA Report will be submitted to the Mpumalanga Department of Agriculture, Rural Development and Land Affairs (DARDLEA) for decision-making.
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EXECUTIVE SUMMARY

PROJECT OVERVIEW AND LOCATION

The Project Applicant, Vhuvhili Solar (RF) (Pty) Ltd (hereafter referred to as the "Project Applicant"), is proposing to design, construct and operate the Vhuvhili Solar Photovoltaic (PV) Energy Facility (SEF) and its associated infrastructure approximately 7 km south-east of the town of Secunda in the Mpumalanga Province. The proposed SEF will have a capacity of up to 300 MW (export) and is subject to a full Scoping and Environmental Impact Assessment (S&EIA) process. The locality and current footprint of the proposed project is depicted in Figure S-1. It should be noted that the project layout has been updated following sensitivities identified by the specialists that needed to be avoided (including cropland). This project layout was then updated based on sensitivities identified by the specialists that needed to be avoided, and an updated project layout taken into the EIA Phase as presented in Chapter 2 (project description). The project layout recommended for approval is included in Figure S-1. The proposed project is situated in the Govan Mbeki Local Municipality and the Gert Sibande District Municipality, in the Mpumalanga Province.

The infrastructure associated with the proposed Vhuvhili SEF includes a Battery Energy Storage System (BESS) and various structures, buildings, and electrical grid infrastructure (EGI) such as an on-site 33/132 kV Substation (SS). Two site alternatives for the on-site SS and BESS (known as the SS and BESS complex) have been identified by the Project Applicant. These are Alternative 1 (A-B) and Alternative 2 (C-D) as shown in Figure S-1. A construction laydown area was also identified and includes the Operation and Maintenance (O&M) buildings. A detailed project description is provided in Chapter 2 of this report.

The proposed Vhuvhili SEF will be developed on the farm portions as indicated in Table S-1 which also specifies the corresponding 21-digit Surveyor General code for each affected farm portion. The properties to be affected by the proposed Vhuvhili SEF development will be leased from the property owners by the Project Applicant for the life span of the Vhuvhili SEF (i.e., up to 25 years).

Table S-1: Farm portions affected by the proposed Vhuvhili SEF project that were assessed by the specialists in the EIA phase

Farm name	Farm No.	Farm Portion	SG code
GROOTVLEI	584	RE	T0IS00000000058400000
GROOTVLEI	293	18	T0IS00000000029300018
GROOTVLEI	293	20	T0IS00000000029300020
GROOTVLEI	293	21	T0IS00000000029300021
POVERTY ACRES	585	RE	T0IS00000000058500000
VLAKSPRUIT	292	21	T0IS00000000029200021

The electricity generated by the proposed Vhuvhili SEF will be transferred from the proposed on-site substation at the proposed Vhuvhili SEF via a 132 kV power line which will extend approximately 12 km in length to the proposed switching station at the proposed Mukondeleli WEF. From there the combined electricity produced by the two Renewable Energy Facilities (REFs) will be transferred to a step-down substation at Sasol where it will be used for the production of green hydrogen and aviation fuel.

The proposed power line is subject to a separate Basic Assessment (BA) process which is undertaken by the Project Applicant in parallel to this EIA process. The proposed Mukondeleli WEF is also subject to a separate S&EIA process which is undertaken by the Project Proponent (NEAS Reference: MPP/EIA/0001099/2022).

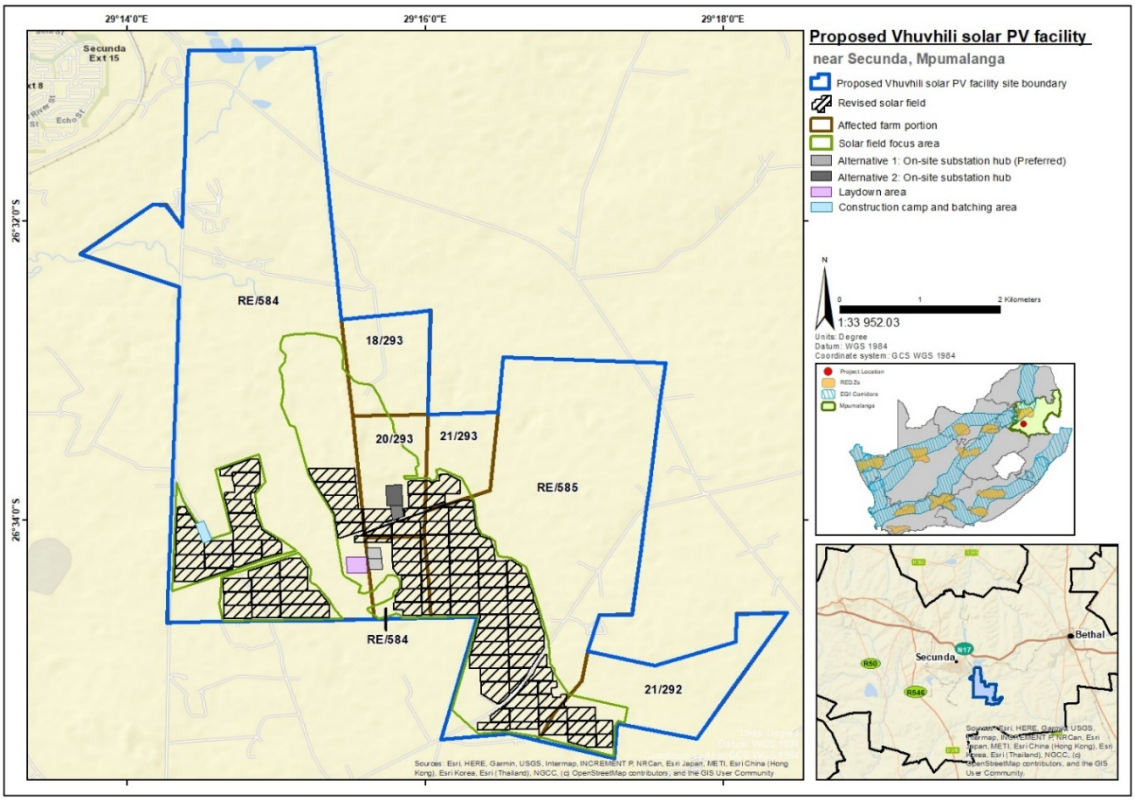

Figure S-1 Revised site layout recommended by the EAP for approval for the proposed Vhuvhili SEF project which was assessed during the EIA Phase.

PROJECT SCENARIOS

The Project Developer, ENERTRAG South Africa (Pty) Ltd (hereafter referred to as the "ENERTRAG"), is currently investigating two scenarios for the uptake of energy from the proposed Vhuvili SEF:

Scenario 1:

The proposed Vhuvhili SEF is planned to provide renewable energy to Sasol (via the 132 kV power line from the on-site substation at the proposed Vhuvhili SEF to the switching station at the proposed Mukondeleli WEF from where the electricity will be transferred to Sasol) for the production of green hydrogen and green aviation fuel. This is viewed as the main proposed outcome of the proposed project, via an agreement between several consortium parties including ENERTRAG and Sasol.

Scenario 2:

Alternatively, should the above agreement not materialise under Scenario 1, and a private off-taker of the renewable energy cannot be obtained, the proposed Vhuvhili SEF will be bid into the future rounds of the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) or similar tender processes. It is understood that the Environmental Authorisation (EA) received by the competent authority, i.e., the DARDLEA for the proposed Vhuvhili SEF (should it be granted) would be suitable for both scenarios. Furthermore, the scenario of providing the proposed renewable energy to Sasol via a private off-taker agreement and the scenario of bidding the project into the REIPPPP would have no bearing on the assessment of potential environmental impacts of the proposed project by the Environmental Assessment Practitioner (EAP).

Therefore, both scenarios have been documented in the EIA Report, i.e., Scenario 1 of having a private off-taker (i.e., Sasol) and Scenario 2 of bidding the project into the REIPPPP or another suitable tender process.

PROJECT TEAM

In accordance with Regulation 12 (1) of the 2014 NEMA EIA Regulations (as amended), ENERTRAG has appointed the Council for Scientific and Industrial Research (CSIR) to undertake the S&EIA Process to determine the potential biophysical, social and economic impacts associated with the proposed project, and to identify how such negative impacts can be avoided, remedied, mitigated or managed; and how positive impacts can be enhanced. Public participation forms an integral part of the S&EIA Process and assists in identifying issues and possible alternatives to be considered. The CSIR is also undertaking the Public Participation Process (PPP) for this S&EIA Process. Details on the PPP are included in Chapter 4 of this Draft EIA Report.

The project team, which is involved in this S&EIA Process, is listed in Table S-2 below. This team includes several specialists who have extensive experience in conducting specialist studies for REFs in South Africa.

Table S-2. Project Team for the Vhuvhili SEF Scoping and EIA Process

NAME	ORGANISATION	ROLE/STUDY TO BE UNDERTAKEN
Environmental Management Services (CSIR)		
Paul Lochner *(Registered EAP (2019/745))*	CSIR	EAP, Reviewer, Technical Advisor and Quality Assurance
Minnelise Levendal (*Pr.Sci.Nat.)*	CSIR	Project Manager
Dhiveshni Moodley *(Cand.Sci.Nat.)*	CSIR	GIS specialist
Willan Adonis	CSIR	Project Officer
Helen Antonopoulus	CSIR	Project Officer
Suvasha Ramcharan	CSIR	Project Officer
Specialists		
Johann Lanz (*Pr.Sci.Nat.)*	Private	Agriculture and Soils Assessment
Dr Noel van Rooyen *(Pr.Sci.Nat.)*	Ekotrust cc	Terrestrial Biodiversity and Species Impact Assessment
Lorainmari den Boogert (Pr.Sci.Nat.), Antoinette Bootsma Nee van Wyk (Pr.Sci.Nat.), Rudi Bezuidenhoudt (Pr.Sci.Nat.) and André Strydom	Iggdrasil Scientific Services & Limosella Consulting	Aquatic Biodiversity and Species Impact Assessment
Chris van Rooyen and Albert Froneman (*Pr.Sci.Nat.)*	Chris van Rooyen Consulting	Avifauna Impact Assessment
Kerry Schwartz	SiVEST SA (Pty) Ltd	Visual Impact Assessment
Dr Jayson Orton	ASHA Consulting (Pty) Ltd	Heritage Impact Assessment (Archaeology and Cultural Landscape)
Professor Marion Bamford	Private	Palaeontology Site Sensitivity Verification Report
Tony Barbour	Tony Barbour Environmental Consulting	Socio-Economic Impact Assessment
Adrian Johnson	JG Afrika (Pty) Ltd	Traffic Impact Assessment
Bulala Khuthadzo (Pr.Sci.Nat.)	WSP GOLDER	Geotechnical Desktop study
Paul Lochner (EAP), Helen Antonopoulus, Lizande Kellerman (Pr.Sci.Nat.) and Minnelise Levendal (Pr.Sci.Nat.)	CSIR	Civil Aviation Site Sensitivity Verification
Paul Lochner (EAP), Helen Antonopoulus, Lizande Kellerman (Pr.Sci.Nat.) and Minnelise Levendal (Pr.Sci.Nat.)	CSIR	Defence Site Sensitivity Verification
Debbie Mitchell *(Pr Eng)*	Ishecon cc	Battery Storage High Level Safety, Health, and Environment Risk Assessment

PROJECT DESCRIPTION

It is important to point out at the outset that the exact specifications of the proposed project components will be determined during the detailed engineering phase (subsequent to the issuing of Environmental Authorisation (EA), should it be granted for the proposed project). **It should also be noted that the project footprint may be refined as part of the detailed specialist studies to be undertaken in the EIA phase. Hence, an updated, refined footprint may be presented in the EIA Report.**

A summary of the key components of the proposed Vhuvhili SEF project is provided in Table S-3 below.

Table S-3. Summary of the proposed Vhuvhili SEF project components and associated infrastructure

Component	Description
Solar Field	
Type of Technology	PV Technology
Generation Capacity	300 MW (export)
SEF Footprint: Total developable area that includes the PV arrays and associated infrastructure within the fenced off area of the PV facility	Approximately 694 ha
PV Panel Structure (with the following possible tracking and mounting systems): ▪ Single Axis Tracking structures (aligned north-south); ▪ Fixed Axis Tracking (aligned east-west); ▪ Dual Axis Tracking (aligned east-west and north-south); ▪ Fixed Tilt Mounting Structure; or ▪ Bifacial Solar Modules.	Height: Approximately 6 m (maximum)
Building Infrastructure	
Warehouses/Workshops	▪ Footprint: Approximately 1000 m^2 ▪ Height: Up to 10 m
Site Offices and meeting room	▪ Footprint: Approximately 250 m^2 ▪ Height: Up to 10 m
Operational and Maintenance (O&M) Control Centre	▪ Footprint: Approximately 250 m^2 ▪ Height: Up to 10 m This will form part of the construction laydown area
Guard Houses	▪ Number of guard houses: Up to 6 ▪ Footprint of each guard house: Approximately 35 m^2 ▪ Height of each guard house: Up to 6 m
Ablution facilities	▪ Number of ablution facilities: Up to 6 ▪ Footprint of each ablution facility: Approximately 250 m^2 ▪ Height of each ablution facility: Up to 6 m
Inverter/Transformer Stations	▪ Preliminary total number of stations: 249

Component	Description
	▪ Footprint: Approximately 220 m^2 each ▪ Height: Approximately 3 m each
On-site Substation Complex	▪ Footprint: Approximately 4 ha ▪ Height: Up to 10 m ▪ Capacity: Internal voltage step up from 22 kV or 33 kV to 132 kV for a grid connection.
Associated Infrastructure	
Battery Energy Storage System (BESS)	▪ Technology: It is proposed that Lithium Battery Technologies, such as Lithium-Ion Phosphate, Lithium Nickel Manganese Cobalt oxides or Vanadium Redox flow technologies will be considered as the preferred battery technology; however, the specific technology will only be determined following Engineering, Procurement and Construction (EPC) procurement. ▪ Footprint: Approximately 5 ha ▪ Height of BESS: Up to 10 m ▪ Capacity of BESS: Up to 300 MW/1200 MWh
On-site medium voltage (22 or 33 kV) internal power lines/underground cables	Depth: Maximum depth of 1.5 m
Underground low voltage cables or cable trays	Depth: Maximum depth of 1.5 m
Access roads (including upgrading and widening of existing roads)	Current width: Approximately 5 m Upgraded width: Approximately 10 m Two site access points are recommended for the site. The access points are proposed off the gravel sections of the D823 and D619 road.
Internal roads	Internal roads to be widened to approximately 10 m, including turning circle/bypass areas of up to 20 m at some sections during the construction phase. As such, the roads and cables will be positioned within a 20 m wide corridor. Existing roads will be upgraded wherever possible, although new roads will be constructed where necessary.
Length of internal access roads	Estimated to be up to approximately 20 km.
Fencing around the PV Facility Perimeter	Type: Palisade or mesh or fully electrified

Component	Description
	Height: Up to 3 m
Storm water channels	Details to be confirmed once the EPC contractor has been selected and the design is finalised. A detailed stormwater management plan would need to be developed.
Work area during the construction phase (i.e., laydown area)	Temporary Laydown area: Approximately: 4.5 ha. The need for a permanent laydown area will be confirmed during the EIA Phase.
Water Requirements	▪ Approximately 30 000 m^3 of water is estimated to be required for the construction phase, over an estimated up to a 36-month construction period. ▪ Approximately 5 000 m^3 of water is estimated to be required per annum for the operational phase for a minimum of 20-year operational lifespan. ▪ Water be sourced from the following potential sources: Local municipality, third-party water supplier (e.g., Sasol) or existing or drilled boreholes on site.

NEED FOR AN ENVIRONMENTAL IMPACT ASSESSMENT

The proposed Vhuvhili SEF is not located within any of the Renewable Energy Development Zones (REDZs) gazetted in Gazette 41445, GN R114 on 16 February 2018; and Gazette 44191, GN R144 on 26 February 2021. It is also not located within any of the strategic power corridors gazetted in Gazette 41445, GN R113 on 16 February 2018; and Gazette 44504, GN R383 on 29 April 2021.

Therefore, in terms of the NEMA 2014 EIA Regulations, as amended, published in GN R326, R327, R325 and R324, a full S&EIA Process is required for the proposed project with a 107-day decision-making timeframe, as opposed to a BA Process and 57-day decision-making time frame allowed for in the REDZs and strategic power corridors. The need for the S&EIA is triggered by, amongst others, the inclusion of Activity 1 listed in GN R325 (Listing Notice 2):

"The development of a facility or infrastructure for the generation of electricity from a renewable resource where the electricity output is 20 megawatts or more, excluding where such development of facility or infrastructure is for photovoltaic installations and occurs (a) within an urban area; or (b) on existing infrastructure".

Chapter 4 of this Draft EIA Report contains the detailed list of activities contained in R327, R325, and R324 which may be triggered by the various project components and thus form part of the Scoping and EIA Process.

The purpose of the S&EIA Process is to identify, assess and report on any potential impacts the proposed project, if implemented, may have on the receiving environment. The S&EIA process therefore needs to show the Competent Authority, the DARDLEA; and the project proponent, ENERTRAG, what the consequences of their choices will be in terms of impacts on the biophysical and socio-economic environment and how such impacts can be, as far as possible, enhanced or mitigated and managed as the case may be.

PUBLIC PARTICIPATION PROCESS

An Application for EA for the Vhuvhili SEF S&EIA project was submitted to the DARDLEA on 13 June 2022 together with the Draft Scoping Report for comment.

The Draft Scoping Report was released for a 30-day commenting period which extended from 13 June to 14 July 2022. The Draft Scoping Report was also made available on the following website (https://www.csir.co.za/environmental-impact-assessment). A newspaper advertisement was placed in the "Ridge Times" in English and Afrikaans to notify Interested and Affected Parties of the release of the Draft Scoping Report for comment (proof of which has been included in Appendix E.2 of this EIA Report). Copies of all comments received during the review of the Draft Scoping Report have been included in Appendix E.4 of the EIA Report as well as in Comments and Response Report (Appendix E.5 to the EIA Report). In line with Regulation 21 (1) of the NEMA EIA Regulations, 2014, as amended, the Final Scoping

Report have been submitted to the Mpumalanga DARDLEA for decision making on 27 July 2022 and has been approved by DARDLEA.

Copies of comments received after the 30-day commenting period have been added to Appendix E.4 of the EIA Report as well as to the Comments and Response Report (Appendix E.5 to the EIA Report).

The Draft EIA Report is now being released to I&APs and stakeholders for a 30-day commenting period, extending from 14 November 2022 to 14 December 2022. The Draft EIA Report will be uploaded to the project website (i.e., https://www.csir.co.za/environmental-impact-assessment) for I&APs to access it. As a supplementary mechanism, the Draft EIA Report will also be uploaded to other alternative web-platforms such as Dropbox or Google Drive. Written notification of the commencement of the EIA Phase, the availability of the Draft EIA Report for comment and the outcome of decision-making on the Final Scoping Report will be sent to all I&APs and Organs of State included on the project database via email, where email addresses are available. This notification will be sent at the commencement of the 30-day comment period on the Draft EIA Report and include information on the proposed project and notification of the release and availability of the report. Copies of all written comments received during the review of the Draft EIA Report will be compiled into a Comments and Responses Report for inclusion in an annexure to the Final EIA Report that will be submitted to the DFFE for decision-making.

The results of the specialist assessments and other relevant project information are summarised and integrated into this EIA Report. Part C.1 and C.2 of this EIA Report include Environmental Management Programmes (EMPrs) for the proposed Vhuvhili SEF and the on-site substation respectively. The EMPrs are based on the recommendations made by specialists for design, construction, operation and decommissioning of the proposed Vhuvhili SEF project.

IDENTIFICATION OF ISSUES

Based on the specialist studies (Chapters 6 to 15 and Chapter 18), the following main direct potential impacts were identified (Table S-4.). The management and mitigation measures to ensure the potential impacts are suitably addressed and managed during all phases of the project are included in the EMPrs (Part C of this EIA Report).

Table S-4: Impacts identified by the specialists

KEY IMPACT	IMPACTS IDENTIFIED
Agriculture	▪ Loss of agricultural potential by occupation of land. ▪ Loss of agricultural potential by soil degradation including erosion and topsoil loss. ▪ Enhanced agricultural potential through increased financial security for farming operations[1].
Visual	**Construction Phase** ▪ Potential alteration of the visual character and sense of place resulting from construction activities. ▪ Potential visual impacts of construction affecting receptors in the study area, including: o visual intrusion resulting from large construction vehicles and equipment; o visual effect of construction laydown areas and material stockpiles;

[1] This potential issue is considered to have a positive impact because of the proposed development.

KEY IMPACT	IMPACTS IDENTIFIED
	○ impacts of increased dust emissions from construction activities and related traffic; ○ visual scarring of the landscape as a result of site clearance and earthworks; and ○ visual pollution resulting from littering on the construction site. **<u>Operational Phase</u>** ▪ Potential alteration of the visual character and sense of place; ▪ Potential visual impacts affecting receptors in the study area, including: ○ visual intrusion resulting from the presence of PV arrays, particularly in more natural undisturbed settings; ○ visual clutter caused by substation and other associated infrastructure on-site; ○ impacts of increased dust emissions from maintenance vehicles accessing the site via gravel roads; and ○ visual scarring of the landscape as a result of site clearance and earthworks. ▪ Potential glint and glare impacts on passing motorists and nearby receptors; and ▪ Potential visual impact on the night-time visual environment. **<u>Decommissioning Phase</u>** ▪ Potential visual impacts of decommissioning affecting receptors in the study area, including: ○ visual intrusion resulting from vehicles and equipment involved in the decommissioning process; ○ impacts of increased dust emissions resulting from decommissioning activities and related traffic; ○ visual scarring of the landscape as a result of decommissioning activities; and ○ visual intrusion of any remaining infrastructure on the site.
Heritage and Cultural Landscape	▪ Damage or destruction of archaeological sites or graves. ▪ Visible landscape scarring.
Palaeontology	**<u>Construction Phase</u>** ▪ Damage or destruction of palaeontological materials in excavations. **<u>Decommissioning Phase</u>** ▪ Damage or destruction of palaeontological materials.
Terrestrial Biodiversity and Species	**<u>Construction Phase</u>** ▪ The clearing of natural vegetation. ▪ The loss of threatened, protected, CITES listed and/or endemic plants/animals. ▪ Loss of faunal habitat. ▪ Direct faunal mortalities due to construction and increased traffic. ▪ Increased dust deposition. ▪ Increased human activity, noise, and light levels. ▪ Establishment of alien vegetation. ▪ Increased water run-off and erosion. ▪ Changes in animal behaviour. **<u>Operational Phase</u>** ▪ Direct faunal mortalities.

KEY IMPACT	IMPACTS IDENTIFIED
	▪ Establishment of alien vegetation. ▪ Increased water run-off and erosion. ▪ Changes in animal behaviour. **Decommissioning Phase** ▪ Direct faunal mortalities. ▪ Increased dust deposition. ▪ Establishment of alien vegetation. ▪ Increased water run-off and erosion.
Aquatic Biodiversity and Species	**Construction Phase** ▪ Alteration in flow regime; ▪ Changes in sediment regimes; ▪ Introduction and spread of alien vegetation; ▪ Loss and disturbance of riparian/watercourse habitat and vegetation; ▪ Alteration in water quality due to pollution; and ▪ Loss of aquatic biota. **Operational Phase** ▪ Alteration in flow regime; ▪ Changes in sediment regimes; ▪ Introduction and spread of alien vegetation; ▪ Loss and disturbance of riparian/watercourse habitat and vegetation; ▪ Alteration in water quality due to pollution; and ▪ Loss of aquatic biota. **Decommissioning Phase** ▪ Alteration in flow regime; ▪ Changes in sediment regimes; ▪ Introduction and spread of alien vegetation; ▪ Loss and disturbance of riparian/watercourse habitat and vegetation; ▪ Alteration in water quality due to pollution; and ▪ Loss of aquatic biota.
Avifauna Assessment	**Construction Phase** ▪ Displacement due to disturbance associated with the construction of the solar PV plants and associated infrastructure. ▪ Total or partial displacement of avifauna due to habitat transformation associated with the presence of the solar PV plants and associated infrastructure. **Operational Phase** ▪ Bird mortality and injury as a result of collisions with the solar panels. ▪ Entrapment of priority species in the perimeter fences, leading to mortality. ▪ Electrocution of priority species in the onsite substations. **Decommissioning Phase** ▪ The noise and movement associated with the activities at the development area will be a

KEY IMPACT	IMPACTS IDENTIFIED
	source of disturbance which would lead to the displacement of avifauna from the area.
Socio-Economic	**Construction Phase** ▪ Impacts associated with the presence of construction workers on local communities. Disruption of local social structures ▪ Potential influx of jobseekers. ▪ Increased risks to livestock and farming infrastructure associated with the construction related activities and presence of construction workers on the site. ▪ Increased risk of grass fires associated with construction related activities. ▪ Nuisance impacts, such as noise, dust, and safety, associated with construction related activities and vehicles. ▪ Impact on productive farmland. ▪ Creation of employment and business opportunities, and opportunity for skills development and on-site training. **Operational Phase** ▪ Creation of employment opportunities ▪ Generate renewable energy to produce green hydrogen and ammonia. ▪ Benefits to the affected landowners. ▪ Visual impacts and associated impacts on sense of place. ▪ Impact on property values. ▪ Impact on tourism. **Decommissioning Phase** ▪ Potential creation of additional, construction-type jobs.
Geotechnical Study	**Construction Phase** ▪ Increase stormwater velocity. ▪ Increase in soil and wind erosion due to clearing of vegetation. ▪ Creation of drainage paths along access tracks. ▪ Sedimentation of non-perennial features and excessive dust. ▪ The displacement of natural earth material and overlying vegetation leading to erosion. ▪ Potential groundwater and drainage feature contamination. ▪ Slope instability around structures. ▪ Damage of proposed development during construction. **Decommissioning Phase** ▪ Increase in soil and wind erosion due to clearance of structures. ▪ Displacement of soil and damage to vegetation by vehicles. ▪ The displacement of natural earth material and overlying vegetation leading to erosion. ▪ Potential oil spillages due to clearance of structures. ▪ Slope instability around structures.
Traffic	**Construction, Operational and Decommissioning Phases** ▪ Increase in traffic and associated noise, dust, and exhaust pollution due to traffic.
BESS Risk	**Construction, Operational and Decommissioning Phases in terms of human health and equipment**

KEY IMPACT	IMPACTS IDENTIFIED
Assessment	**safety:** ▪ Chronic exposure to toxic chemical or biological agents ▪ Exposure to noise ▪ Exposure to temperature extremes and/or humidity ▪ Exposure to psychological stress ▪ Exposure to ergonomic stress ▪ Human and Equipment Safety - exposure to acute toxic chemical and biological agents ▪ Human and Equipment Safety - exposure to violent release of kinetic or potential energy ▪ Human and Equipment Safety - exposure to fire radiation ▪ Human and Equipment Safety - exposure to explosion over pressures

OVERALL ENVIRONMENTAL IMPACT STATEMENT AND REASONED OPINION FROM THE EAP

The information presented in the EIA Report, including its associated appendices, contributes to this overall environmental impact statement and reasoned opinion from the EAP as to whether the proposed project should or should not be authorised, including any conditions that should be made in respect of the authorisation (should it be granted).

Based on the findings of the specialist assessments, which all recommend that the proposed project can proceed and should be authorised by the Mpumalanga DARDLEA, the proposed project is considered to have an **overall low to very low negative environmental impact** and an **overall moderate positive socio-economic impact** (with the implementation of respective mitigation and enhancement measures).

The proposed project will take place within the revised development footprint of 694 ha as discussed in Chapter 5 and Chapter 19 of the EIA Report which avoids the sensitive features identified by the respective specialists (including cropland).

On a municipal planning level, the proposed Vhuvhili SEF project is aligned with the vision and goals of the GMLM and the GSDM as set out in their IDPs as it will assist in local job creation during the construction and operation phases of the project (if approved by the DARDLEA).

Section 24 of the Constitutional Act states that "*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 prevents pollution and ecological degradation; promotes conservation; and secures ecologically sustainable development and use of natural resources while promoting justifiable economic and social development*". Based on this, this EIA was undertaken to ensure that these principles are met through the inclusion of appropriate management and mitigation measures, and monitoring requirements. These measures will be undertaken to promote conservation by avoiding the sensitive environmental features present on site and through appropriate monitoring and management plans (refer to the EMPrs in Part C of this EIA Report).

The outcomes of this project therefore succeed in meeting the environmental management objectives of protecting the ecologically sensitive areas and supporting sustainable development and the use of natural resources, whilst promoting justifiable socio-economic development in the towns nearest to the project site. The findings of this EIA show that all natural resources will be used in a sustainable manner (i.e., this

project is a renewable energy project and the majority of the negative site specific and cumulative environmental impacts are considered to be of low significance with mitigation measures implemented), while the benefits from the project will promote justifiable economic and social development.

Taking into consideration the findings of the S&EIA Process and given the national and provincial strategic requirements for renewable energy development, it is the opinion of the EAP, that the project benefits outweigh the costs and that the project will make a positive contribution to the production of renewable energy for South Africa. This will assist South Africa transition away from relying on coal for approximately 90% of the electricity generation, with associated environmental and health impacts. Provided that the specified mitigation measures are applied effectively, **it is recommended that the proposed project receives EA in terms of the NEMA EIA Regulations, 2014, as amended promulgated under the NEMA.**

It is understood that the information contained in this EIA Report and appendices is sufficient to make a decision in respect of the activity applied for. It is recommended that the EA be valid for a period of 10 years.

Summary of where requirements of Appendix 3 of the 2014 NEMA EIA Regulations (GN R982, as amended in GN R326) are provided in this Environmental Impact Assessment Report

Section of the EIA Regulations	Requirements for an Environmental Impact Assessment Report in terms of Appendix 3 of the 2014 NEMA EIA Regulations (GN R982, as amended in GN R326)	Chapter / Appendix
Appendix 3 - (3) (1) (a)	Details of - i. the EAP who prepared the report; and ii. the expertise of the EAP, including a curriculum vitae;	Chapter 1: Section 1.9 Appendix A
Appendix 3 - (3) (1) (b)	The location of the development footprint of the activity on the approved site as contemplated in the accepted scoping report, including - i. the 21-digit Surveyor General code of each cadastral land parcel; ii. where available, the physical address and farm name; iii. where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties;	Chapter 1: Table 1.1; Figure 1.1 Chapter 2: Table 2.1 and Chapter 19: Table 19.1 and Figure 19.1
Appendix 3 - (3) (1) (c)	A plan which locates the proposed activity or activities applied for as well as the associated structures and infrastructure at an appropriate scale, or, if it is - i. a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or ii. on land where the property has not been defined, the coordinates within which the activity is to be undertaken;	Chapter 1: Section 1.2
Appendix 3 - (3) (1) (d)	A description of the scope of the proposed activity, including – i. all listed and specified activities triggered and being applied for; ii. a description of the associated structures and infrastructure related to the development;	Chapter 2: Section 2.1.and Section 2.2 Chapter 4: Section 4.2 and Table 4.1
Appendix 3 - (3) (1) (e)	A description of the policy and legislative context within which the development is located and an explanation of how the proposed development complies with and responds to the legislation and policy context;	Chapter 1: Section 1.3 Chapter 4: Section 4.1; Section 4.2 and Section 4.3
Appendix 3	A motivation for the need and desirability for the proposed development, including	Chapter 1: Sections 1.4

Section of the EIA Regulations	Requirements for an Environmental Impact Assessment Report in terms of Appendix 3 of the 2014 NEMA EIA Regulations (GN R982, as amended in GN R326)	Chapter / Appendix
- (3) (1) (f)	the need and desirability of the activity in the context of the preferred development footprint within the approved site as contemplated in the accepted scoping report;	and 1.10 Chapter 5
Appendix 3 – (3) (1) (g)	A motivation for the preferred development footprint within the approved site as contemplated in the accepted scoping report	Chapter 5: Section 5.5
Appendix 3 – (3) (1) (h)	A full description of the process followed to reach the proposed preferred activity, site and location of the development footprint within the site, including -	(i). Chapter 5
	i. details of all the alternatives considered;	(ii). Chapter 4: Section 4.4 Appendix D and Appendix E
	ii. details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;	(iii). Appendix E.4 Appendix E.5: Comments and Responses Report
	iii. a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them;	(iv). Chapters 3, 6 - 15
	iv. the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	(v). Chapters 6 - 15
	v. the impacts and risks which have informed the identification of each alternative, including the nature, significance, consequence, extent, duration and probability of such identified impacts, including the degree to which these impacts –	(vi). Appendix G
	(aa) can be reversed;	(vii). Chapter 6 - 15
	(bb) may cause irreplaceable loss of resources; and	(viii). Chapter 6 - 15
	(cc) can be avoided, managed or mitigated;	(ix). Chapter 5
	vi. the methodology used in identifying and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives;	(x). Chapter 5
	vii. positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	
	viii. the possible mitigation measures that could be applied and level of residual risk;	
	ix. the outcome of the site selection matrix;	
	x. if no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such and a concluding statement indicating the preferred alternatives, including preferred location of the activity;	
Appendix 3 - (3) (1) (i)	A full description of the process undertaken to identify, assess and rank the impacts the activity and associated structures and infrastructure will impose on the preferred development footprint on the approved site as contemplated in the accepted scoping report through the life of the activity, including –	Throughout Chapters 6 - 15
	i. a description of all environmental issues and risks that were identified during the environmental impact assessment process; and	
	i. an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures;	
Appendix 3 – (3) (1) (j)	An assessment of each identified potentially significant impact and risk, including-	Throughout Chapters 6-15
	i. cumulative impacts;	
	ii. the nature, significance and consequences of the impact and risk;	

Section of the EIA Regulations	**Requirements for an Environmental Impact Assessment Report in terms of Appendix 3 of the 2014 NEMA EIA Regulations (GN R982, as amended in GN R326)**	Chapter / Appendix
	iii. the extent and duration of the impact and risk; iv. the probability of the impact and risk occurring; v. the degree to which the impact and risk can be reversed; vi. the degree to which the impact and risk may cause irreplaceable loss of resources; and vii. the degree to which the impact and risk can be mitigated;	
Appendix 3 – (3) (1) (k)	Where applicable, a summary of the findings and recommendations of any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final assessment report;	Throughout Chapter 19
Appendix 3 – (3) (1) (l)	An environmental impact statement which contains- i. a summary of the key findings of the environmental impact assessment: ii. a map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred development footprint on the approved site as contemplated in the accepted scoping report indicating any areas that should be avoided, including buffers; and iii. a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;	(i) Throughout Chapters 6 – 15 and 19; Part C.1 and C.2 of this EIA Report (ii) Appendix C and Chapter 19 (iii) Throughout Chapters 6 – 15 and 19; Part C.1 and C.2 of this EIA Report
Appendix 3 – (3) (1) (m)	Based on the assessment, and where applicable, recommendations from specialist reports, the recording of proposed impact management outcomes for the development for inclusion in the EMPr as well as for inclusion as conditions of authorisation;	Chapter 20
Appendix 3 – (3) (1) (n)	The final proposed alternatives which respond to the impact management measures, avoidance, and mitigation measures identified through the assessment;	Chapter 5 and Chapter 19
Appendix 3 – (3) (1) (o)	Any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation;	Throughout Chapters 6 - 15
Appendix 3 – (3) (1) (p)	A description of any assumptions, uncertainties and gaps in knowledge which relate to the assessment and mitigation measures proposed;	Throughout Chapters 6 – 15
Appendix 3 – (3) (1) (q)	A reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation;	Chapter 19
Appendix 3 – (3) (1) (r)	Where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required and the date on which the activity will be concluded and the post construction monitoring requirements finalised;	Not Applicable
Appendix 3 - (3) (1) (s)	An undertaking under oath or affirmation by the EAP in relation to - ii. the correctness of the information provided in the reports; iii. the inclusion of comments and inputs from stakeholders and interested and affected parties; iv. the inclusion of inputs and recommendations from the specialist reports where relevant; and v. any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested or affected parties;	Appendix B

Section of the EIA Regulations	**Requirements for an Environmental Impact Assessment Report in terms of Appendix 3 of the 2014 NEMA EIA Regulations (GN R982, as amended in GN R326)**	Chapter / Appendix
Appendix 3 - (3) (1) (t)	Where applicable, details of any financial provision for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts;	Not applicable
Appendix 3 – (3) (1) (u)	An indication of any deviation from the approved scoping report, including the plan of study, including - i. any deviation from the methodology used in determining the significance of potential environmental impacts and risks; and ii. a motivation for the deviation;	No applicable
Appendix 3 - (3) (1) (v)	Any specific information that may be required by the competent authority; and	Appendix E Appendix F
Appendix 3 - (3) (1) (w)	Any other matters required in terms of section 24(4)(a) and (b) of the Act.	Throughout Chapters 6-15
Appendix 3 - (3) (2)	Where a government notice gazetted by the Minister provides for any protocol or minimum information requirement to be applied to an environmental impact assessment report the requirements as indicated in such notice will apply.	No applicable at this stage