APPENDIX D

TECHNICAL INFORMATION

APPENDIX

STORMWATER MANAGEMENT PLAN

FOR THE

PROPOSED ALTINA 120MW SOLAR PHOTOVOLTAIC & 40MW BATTERY ENERGY STORAGE SYSTEMS PROJECT NEAR THE TOWN OF ORKNEY, FREE STATE PROVINCE

Report prepared for:

Basic Assessment Report

Report prepared by:

Genesis Eco-Energy Developments

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1. OBJECTIVE

This Stormwater Management Plan (SMP) consists of a Water Management Plan, that ensures adequate steps to be taken to mitigate risks associated with all the Project's phases to enable a reduction in any environmental impacts at the proposed Altina 120MW Solar Photovoltaic & 40MW Battery Energy Storage Systems Facility (the Project), near the town of Orkney in the Free State Province, South Africa. This plan is based on preliminary designs and will be modified during detailed design stage. However, it is important that this plan will be used at all times in parallel with other plans throughout the lifecycle of the Project.

To this end the aim of this SMP is to provide:

- Tools for managing storm water flow throughout the lifecycle of the Project.

2. SCOPE

This SMP will serve as a guideline for the use of all stakeholders on the Project (including contractors) as per the environmental impact assessment process and guidelines of the Department of Forestry, Fisheries and the Environment (DFFE). More specifically, this SMP will be edited when relevant during the detailed design, construction and operation phases as it is implemented throughout the lifecycle of the Project.

The detailed SMP will ensure compliance with all relevant regulations in order to prevent off-site migration of contaminated storm water or increased soil erosion. The detailed SMP plan will include detailed designs for the construction and operation phases. The detailed designs will take into account that the topography is mostly flat with a gentle average slope of approximately 4.7% in order to allow surface and subsurface movement of water along drainage lines so as not to impede natural surface and subsurface flows. The drainage designs will enable the natural dissipation of storm water runoff.

To this end, this SMP is an evolving guideline and will be updated and as progress is made during the detailed design phase and during construction and operation phases where successes and failures of procedures may be identified.

Therefore, the primary aims of the SMP are:

- Include all steps and designs to ensure the dissipation of storm water run-off.
- Allow for natural surface and sub-surface flows so as not to impede the movement of water along drainage lines.
- Ensure that the natural habitats on site can be maintained and reduce, where possible, erosion.

3. LEGISLATION AND STANDARDS

There are a lot of legal requirements (National, Provincial and Local Government) to which the Applicant will comply with for the Project. The Applicant will also ensure that all environmental principles and values will be taken into account throughout the Project's lifecycle.

Therefore, all relevant legislation pertaining to the management of stormwater on the Project's site during detailed design, construction and operation phases will be complied with, including but not limited, to the National Environmental Management Act, National Water Act, Conservation of Agricultural Resources Act.

4. THE PROJECT DESCRIPTION

The Project consists of the following systems, sub-systems or components (amongst others):

- PV panel arrays, which are the subsystems which convert incoming sunlight into electrical energy;
- Mounting structures to support the PV panels;
- On-site inverters to convert DC to facilitate AC connection between the solar energy facility and electricity grid;
- Lithium Ion BESS;
- On-site substation (facility substation)
- New 132 kV power lines between the on-site substation and the grid connection point;
- Cabling between the Project's components, to be laid underground (where practical);
- Administration Buildings (Offices);
- Workshop areas for maintenance and storage;
- Temporary laydown areas;
- Internal access roads and perimeter fencing of the footprint;
- High Voltage (HV) Transformers; and
- Security Infrastructure.

Various aspects, including technology, design, construction materials, and structures have been considered by the engineering team during the preliminary design phase of the Project. The proposed layout has been selected by the engineering team with a number of aspects in mind, including safety, land availability/suitability, drainage and general conditions of the site.

4.1 Drainage infrastructure to be installed on site

Due to the relative flat topography of the Project area and with a gentle average slope of approximately 4.7 % and infiltration rates of the soils on site, the drainage infrastructure to be installed may be relatively simple in nature given the low probability of erosion on site. Stormwater runoff on site may be limited to runoff from the buildings and paved surfaces near the buildings and may be disposed of through soak-aways. The stormwater run-off along the main access road may be controlled by side swales and dispersed in a controlled manner at regular intervals. Water will be managed on the surface and dispersed into natural drainage routes. However, more designs may be implemented and will be taken into account in the detailed design of the construction phase.

4.1.1 Buildings

All buildings will be provided with down pipes to control runoff from the roofs. In addition, all buildings will be constructed with a 1 m wide concrete pavement structure around the building to minimise and prevent any runoff related erosion taking place around the buildings.

5. GENERAL GUIDELINES

The purpose of the SMP is to specify general guidelines and principles for stormwater management on the Project site. This will ensure that there won't be a significant increase in the volumes of stormwater in order to prevent ecological damage and erosion. Procedures for the management and control of stormwater throughout the Project lifecycle are described in this plan.

5.1. The Detailed Design Phase

Modify and develop a detailed SMP (by a suitably qualified professional) to ensure that runoff from stormwater does not result in erosion at the collection areas and at the discharge points on site. In general, the following measures may be recommended:

- Points of stormwater discharge to be stabilised
- Porous paving surfaces to be used wherever possible
- The harvesting of stormwater for appropriate uses where possible (such as cistern water or for irrigation) will be incorporated into the design where possible
- Rainwater runoff from roofs and panels will be directed into natural areas where possible
- Waste traps will be included in the stormwater design to catch any litter
- All roads and parking areas to have stable surfaces and channels lined
- All activities that affect surface drainage will be designed so as to ensure that stormwater runoff does not lead to excessive surface erosion problems on the site

5.2. The Construction Phase

The following is to be noted when implementing and maintaining the SMP:

- Run-off from roads will be managed to avoid erosion and pollution problems
- Mitigation steps will be in place to control the flow of excess water so that it does not impact on surface vegetation
- Only vegetation essential for construction will be removed and steps will be made so that no disturbance will occur to the adjoining natural vegetation cove.
- The drainage of the surface will be done in such a way that stormwater will be dissipated quickly and efficiently thereby preventing any erosion taking place
- Prevent stormwater or contaminated water directly entering any watercourse
- Install waste traps to catch litter conveyed by surface runoff

- Implement topsoil and stormwater runoff control management measures to prevent the loss of topsoil
- Dissipate concentrated stormwater flows through energy dissipaters or vegetated areas
- Repair all erosion damage as soon as possible
- All hazardous substances must be stored on an impervious surface in a designated bunded area (able to contain 110% of the total volume of materials stored at any given time)
- The integrity of the impervious surface and bunded area will be inspected regularly and any maintenance work conducted will be recorded in a maintenance report

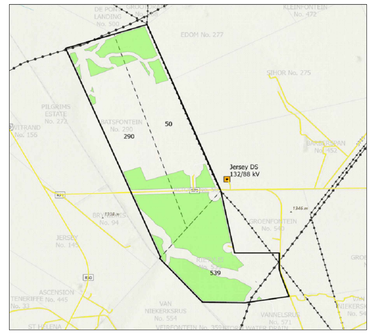
5.3 The Operational Phase

Maintain the storm water management system for the Project on a regular basis and ensure that it is always in good working order. The following are to be noted:

- Ensure that steps are in place to control the flow of excess water to avoid significant impact on surface vegetation.
- Prevent the accumulation of water on the surface. The drainage of the surface should be done in such a way that stormwater will be dissipated quickly and efficiently without any erosion taking place.
- Runoff from roads will be managed to avoid erosion and pollution problems.
- Prevent stormwater or contaminated water directly entering any watercourse.
- Dissipate concentrated stormwater flows through energy dissipaters or vegetated areas.
- Repair all erosion damage as soon as possible
- All waste traps within the stormwater system will be cleaned regularly to ensure efficient functioning

Altina - Layout	
DC Capacity (In MWp)	136.302
Module Watt.	545
Modules per string (In Nos.)	28
Mounting Configuration	1P
Structure Tilt	-55/55
Modules per Table (In Nos.)	56
Table Power [kW]	30.24
Pitch (Mtr.)	7
Nos. Of Total Modules In Plant (In Nos.)	250096
Nos. Of 56 MMS Tracker in plant (In Nos.)	4466
Nos. Of Strings in plant (In Nos.)	8932
Inverter rated power (kVA) @50°C	3125
Number of Inverter Central (3125 kVA)	44
Total installed power AC (MVA) (nominal capacity of inverters)	137.5
Grid limitation (MWac)	120
DC:AC Ratio	1.14

KEY PLAN:-



REVISIONS				
No.	DATE	REMARKS	DRN	CKED

NOTE:-

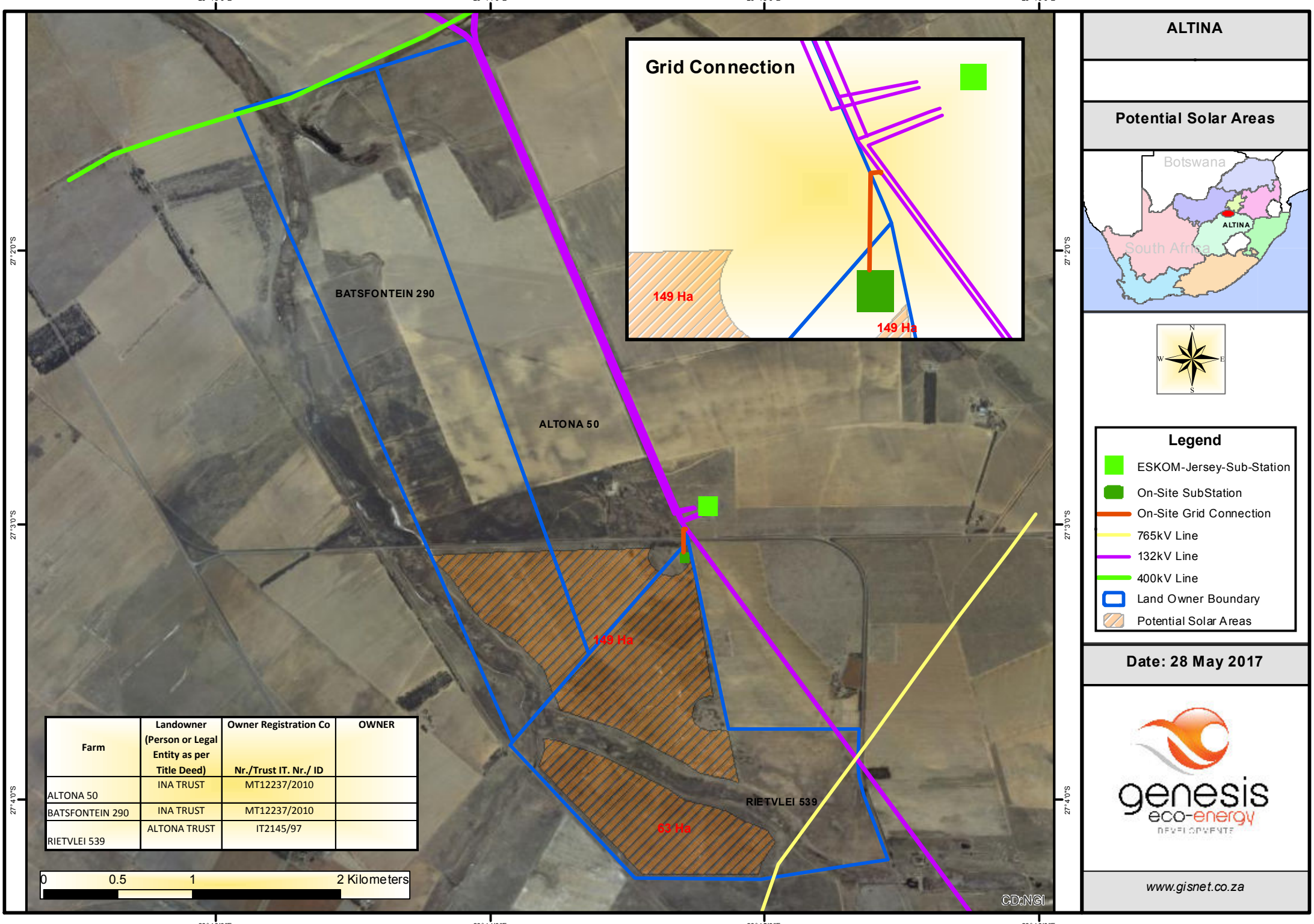
1. PARAMETER MAY GET CHANGE DURING DETAIL ENGINEERING.
2. THE ROADS ARE INDICATIVE AND FOR PRELIMINARY ESTIMATE ONLY.
3. THE PLANNED CAPACITY MAY CHANGE SLIGHTLY DUE TO THE TOPOGRAPHIC AND GEOTECH FEATURES OF THE SITE, THIS VARIATION COULD REDUCE THE CAPACITY OF THE PLANT BY 5%.

BOUNDARY COORDINATES		
POINTS	EASTING	NORTHING
A01	472015.994	7010781.640
A02	473441.696	7011269.564
A03	474748.485	7007896.251
A04	474992.197	7006631.528
A05	475778.442	7006634.186
A06	475778.682	7006306.333
A07	475805.681	7006189.643
A08	475952.190	7005750.093
A09	475187.177	7005619.227
A10	474433.097	7005628.559
A11	473677.954	7006517.291
A12	473694.170	7006539.477

PRELIMINARY- NOT FOR CONSTRUCTION

PROJECT NAME:	Solar PV Plant Altina, South Africa
CUSTOMER:-	Genesis Eco-Energy Developments (Pty) Ltd
PROPERTY DETAILS:-	
DOCUMENT TITLE:	PV ARRAY LAYOUT

DRAWING NO :		SCALE	NTS
DRAWN	HK	SHEET NO	1 OF 1
CHECKED	SM	PAPER SIZE	A1
APPROVED	UA	REV NO.	R0
DATE	16.03.2022		



Farm	Landowner (Person or Legal Entity as per Title Deed)	Owner Registration Co Nr./Trust IT. Nr./ ID	OWNER
ALTONA 50	INA TRUST	MT12237/2010	
BATSFONTEIN 290	INA TRUST	MT12237/2010	
RIETVLEI 539	ALTONA TRUST	IT2145/97	

ALTINA

Potential Solar Areas

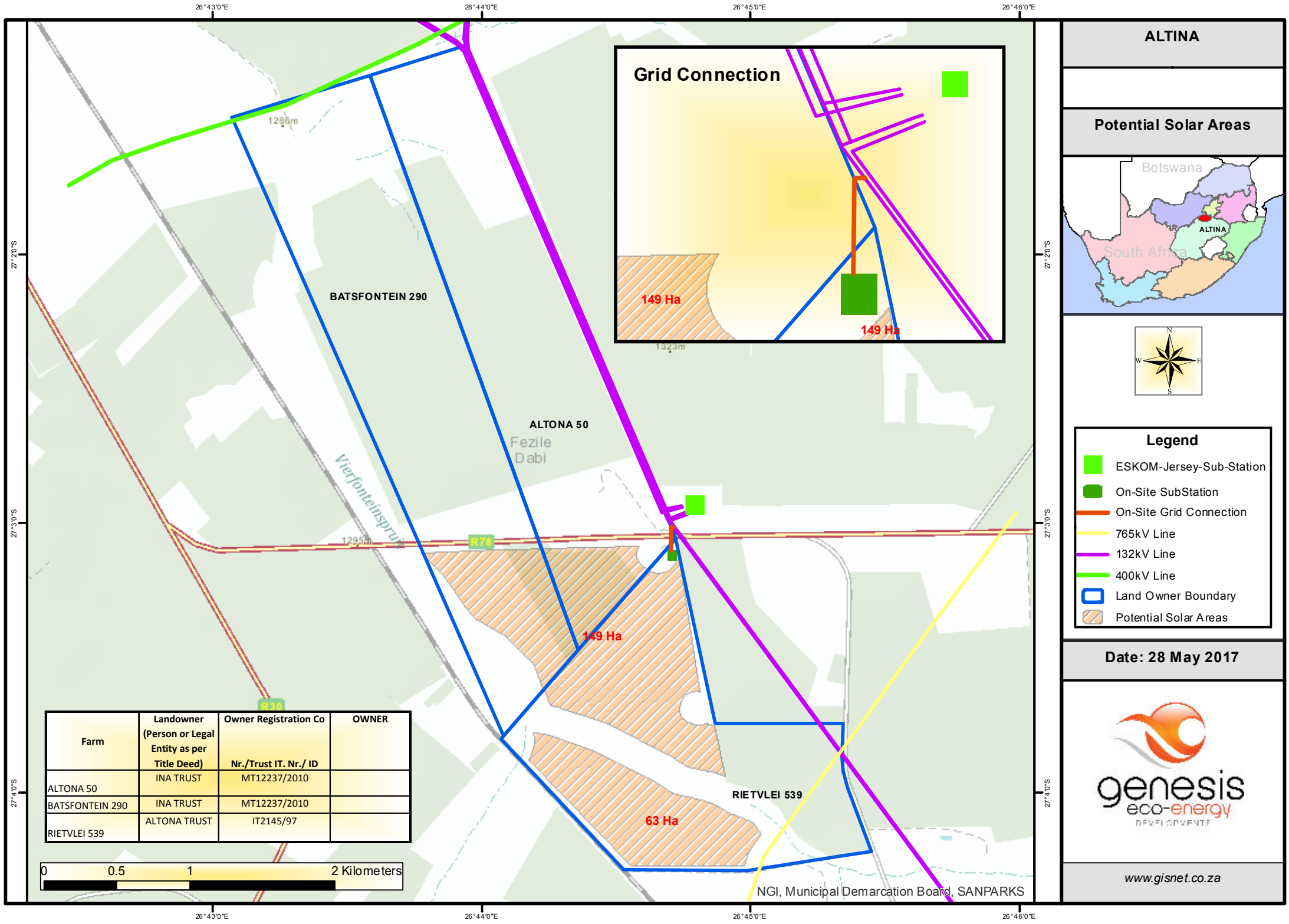
Legend

- ESKOM-Jersey-Sub-Station
- On-Site SubStation
- On-Site Grid Connection
- 765kV Line
- 132kV Line
- 400kV Line
- Land Owner Boundary
- Potential Solar Areas

Date: 28 May 2017

genesis eco-energy DEVELOPMENTS

www.gisnet.co.za



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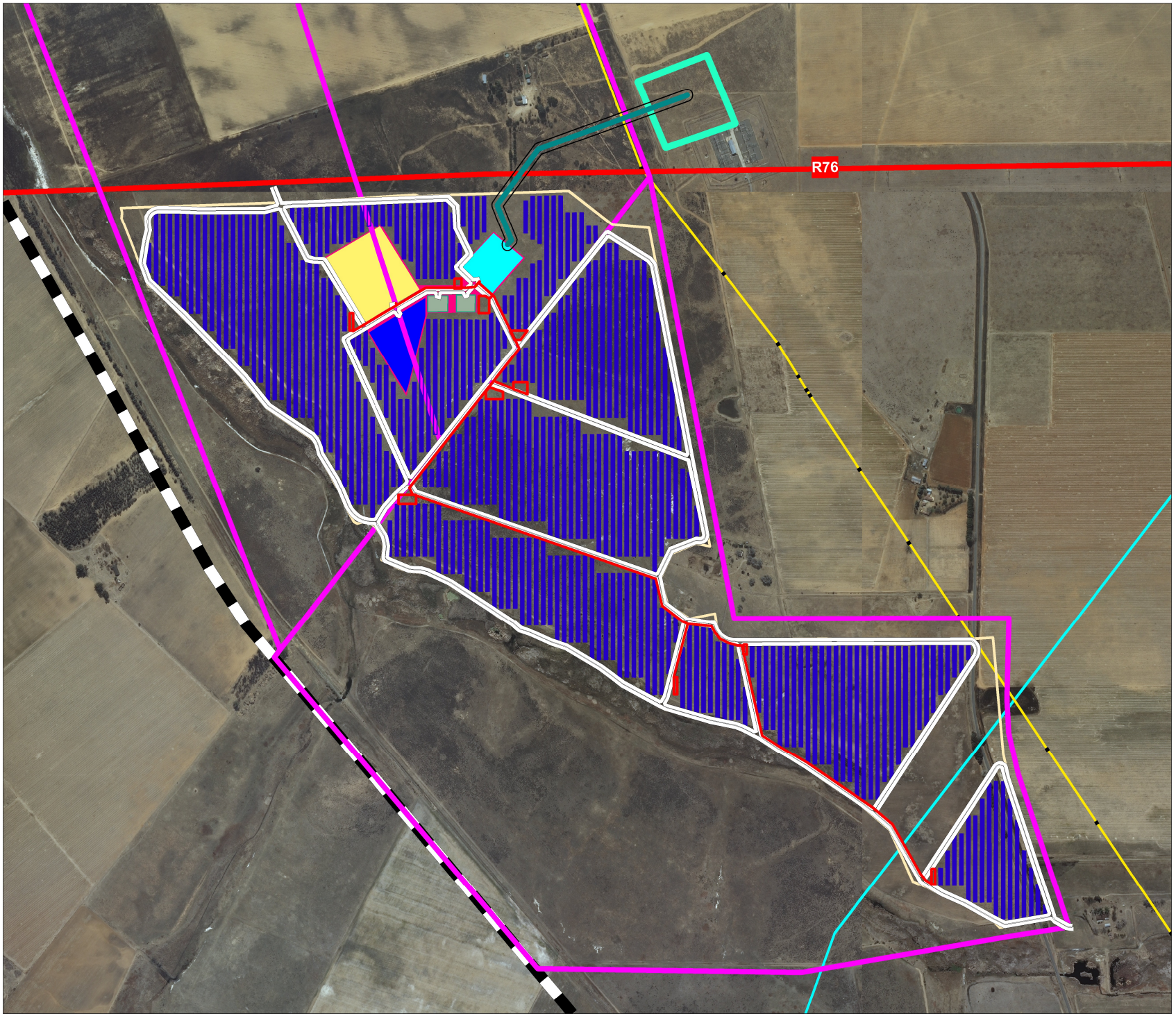

genesis eco-energy DEVELOPMENTS

Altina 120MW Solar PV & BESS Project

Preferred Alternative Layout Map

Legend

- Railway Line
- Main Transmission Powerline_existing
- Existing Power Lines

ALTINA PV PROJECT

- Property Boundary
- Existing Substation

Altina Solar Revised Alternative 2 Layout

- Fencing
- Hardened Area
- O&M Building
- Laydown Areas
- BESS

Proposed Grid

- 31m_servitude_132kV
- Proposed Overhead Powerline
- On-Site Substation
- Solar Panels N/S
- Roads
- Inverters and Internal Cables

NEMAI GREEN

Environmental Solutions for a Sustainable Future

N

Scale 1:15000

0 120 240 360 480 600 m