



Submitted to: Alcon Consulting Services
(Pty) Ltd.
Attention: Mr Victor Coupier
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REPORT:

ALCON AUSSENKEHR SOLAR PLANT –

COMPLIANCE REPORT

PROJECT NUMBER: ECC-43-414-02-REP-A

REPORT VERSION: REV 01

DATE: AUGUST 2022

TITLE AND APPROVAL PAGE

Project Name: Alcon Aussenkehr Solar Plant – Compliance Report
Client Company Name: Alcon Consulting Services (Pty) Ltd.
Client Name: Mr Victor Coupier
Ministry Reference: APP-00920
Authors: Environmental Compliance Consultancy
Status of Report: For internal review
Project Number: ECC-43-414-02-REP-A
Date of issue: August 2022
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TERMS AND ABBREVIATIONS

ABBREVIATIONS	DESCRIPTION
DEA	Directorate of Environmental Affairs
ECC	Environmental Compliance Consultancy
EIA	environmental impact assessment
EMP	environmental management plan
MEFT	Ministry of Environment, Forestry and Tourism

1 INTRODUCTION

1.1 COMPANY BACKGROUND

Alcon Consulting Services (Alcon) is a registered Namibian company established in 2010 to develop a 5 MW photovoltaic power plant (solar plant) on a 24-ha area in Aussenkehr, !Karas region. See Figure 1. Alcon is a subsidiary of Innosun Energy Holdings (Pty) Ltd.

Alcon Consulting Services (Pty) Ltd (the Proponent) has developed the Aussenkehr 5MW Solar PV Park connected to the national grid via the NamPower Aussenkehr Substation. The Solar PV Park covering 15 Ha piece of private farmland is situated to the east of the settlement of Aussenkehr, Karasburg West Constituency, Karasburg District, !Karas Region. The site is accessible through a private access road that comes off the C13 road linking Rosh Pinah and Noordoewer.

Environmental Compliance Consultancy (ECC) has been retained by Innosun Energy Holdings (Pty) Ltd to prepare the application to renew the environmental clearance certificate. The Proponent currently holds a valid environmental clearance certificate for the operation of the Alcon solar plant, for which a renewal is being applied. As part of this application, an onsite environmental compliance audit has been undertaken to determine the status of compliance with the environmental management plan.

The project is located in the !Karas Region. See Figure 1.

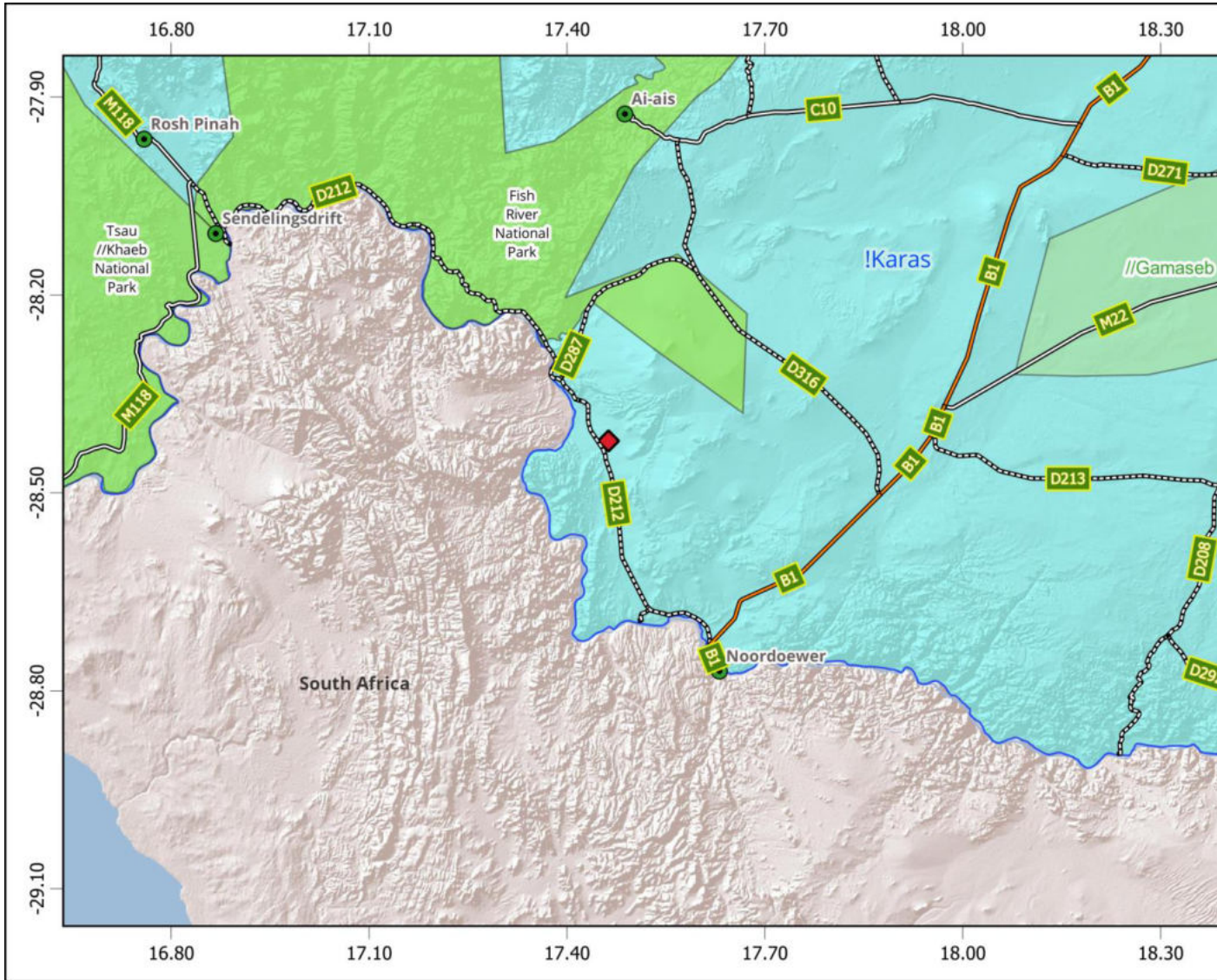


Figure 1

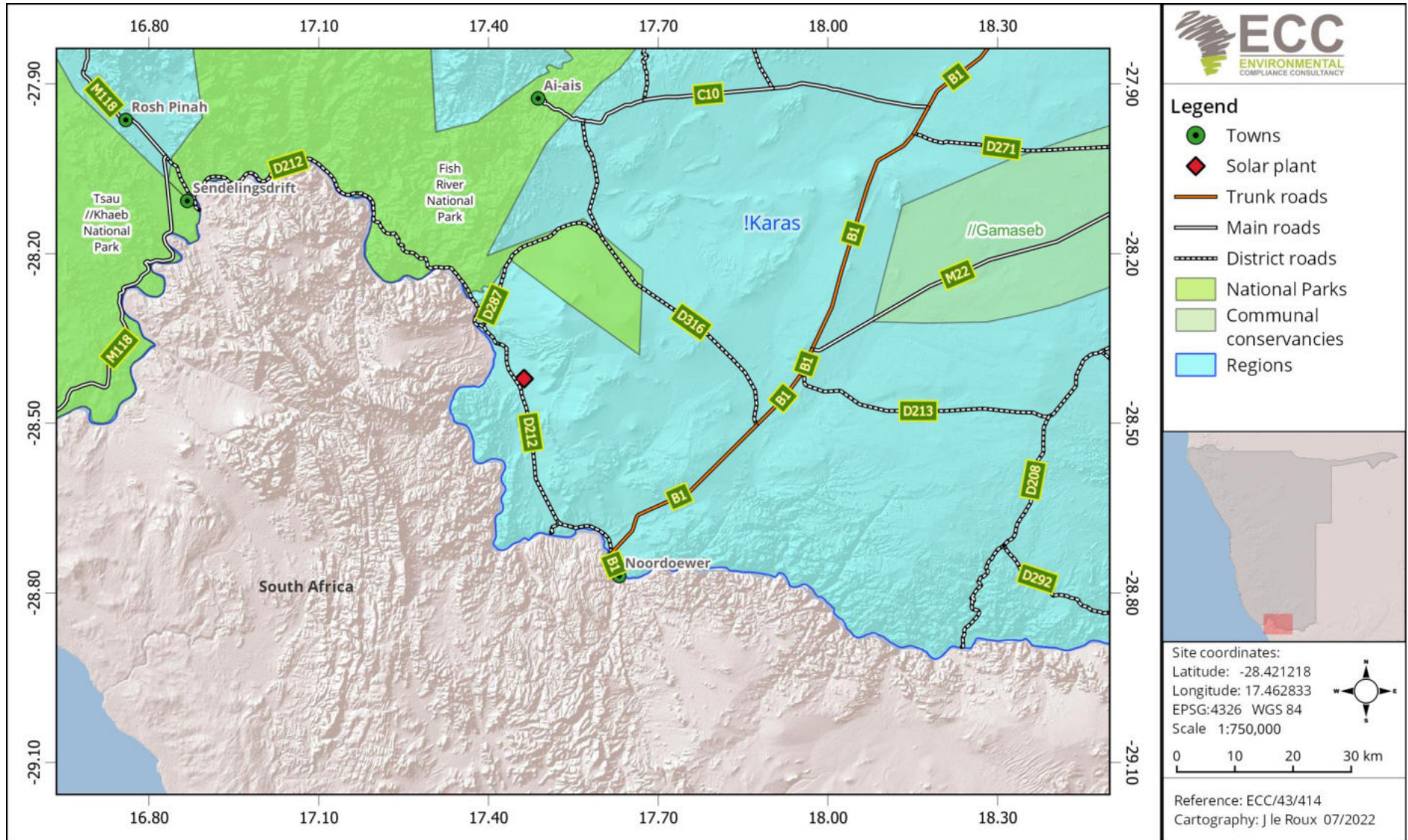


Figure 1 - Project location

1.2 THE PROPONENT OF THE PROPOSED PROJECT

Alcon (Pty) Ltd is the Proponent for the project. The Proponents' details are provided in Table 1.

Table 1 – Proponents details

Company Representative:	Contact Details:
Mr Victor Coupier	Alcon Consulting Services (Pty) Ltd: 2 Schutzen Str P O Box 27527 Windhoek, Namibia

1.3 ENVIRONMENTAL ASSESSMENT PRACTITIONER

Environmental Compliance Consultancy (ECC) (Reg. No. CC 2013/11401) has prepared this renewal report and the on behalf of the Proponent.

This report has been authored by employees of ECC, who have no material interest in the outcome of this report, nor do any of the ECC team have any interest that could be reasonably regarded as being capable of affecting their independence in the preparation of this report. ECC is independent from the proponent and has no vested or financial interest in the project, except for fair remuneration for professional fees rendered based upon agreed commercial rates. Payment of these fees is in no way contingent on the results of this report or the assessment, or a record of decision issued by Government. No member or employee of ECC is, or is intending to be, a director, officer, or any other direct employee of Alcon Consulting Services. No member or employee of ECC has, or has had, any shareholding in Alcon Consulting Services.

All compliance and regulatory requirements regarding this report should be forwarded by email or posted to the following address:

Environmental Compliance Consultancy
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Tel: +264 81 669 7608
Email: info@eccenvironmental.com

1.4 PURPOSE OF REPORT

The purpose of this report is to document the findings of an environmental compliance audit, which accompanies the renewal application for the environmental clearance certificate for the Alcon solar plant.

The approved EMP for the existing environmental clearance certificate is audited to monitor the proceeds of the project and ensure that all measures stipulated in the document are met and effectively adhered to, as required by the Department of Environmental Affairs (DEA). In an event where the project activities are altered, the EMP is required to be revised and amended accordingly.

As per the Environmental Management Act, No. 7 of 2007 and its EIA Regulations of 2012, energy generation cannot be undertaken without a valid environmental clearance certificate. Alcon proposes to continue to generate and feed energy into the national grid system operated by Nampower from its 5MW site in Aussenkehr.

2 BACKGROUND OF AUSSENKEHR SOLAR PLANT

The general site layout of the Aussenkehr 5MW Solar PV Park falls within the 24Ha leased area extent while the actual solar park occupies 15 Ha.

The project commenced with the 15ha large scale Earth Works in March 2017 was completed and commissioned on the 20th of November 2017. A major part of the engineering construction work was construction of the 36 rows of One-Dimensional Ideematec Tracking System and the installation of the 19 400 high-efficiency Poly-Crystalline. The solar panels are assembled on a ground-mounted substructure, which will follow the sun by using a very robust horizontal single-axis-tracker

The PV panels each produce an output of 315 W and are mounted on the tracking structures, approximately 4 m in height from the ground. The solar park uses a decentralised inverter concept which allows for easy maintenance and economic spare part management.

The 22-kV power line from the new grid connection substation connects this Solar PV Park to the existing Aussenkehr Substation west of the site.

The site has a very high standard of all the necessary supporting infrastructures such as external and internal site road accesses covered in dust suppressing loose crushed gravel, high boundary fence, security cameras, onsite security personnel and related solar park infrastructures.

2.1 RENEWAL ACTIVITIES

As part of the project this plant will continue to generate power to supply to the national grid and be maintained by the proponent for approximately another 20 years.

3 ENVIRONMENTAL COMPLIANCE AUDIT

3.1 SITE INSPECTION

A site inspection was conducted by ECC in June 2022 of the Alcon Aussenkehr Solar Plant.



Figure 2 - Solar panels



Figure 3 - Soil erosion prevention mechanisms



Figure 4 - Clean restrooms

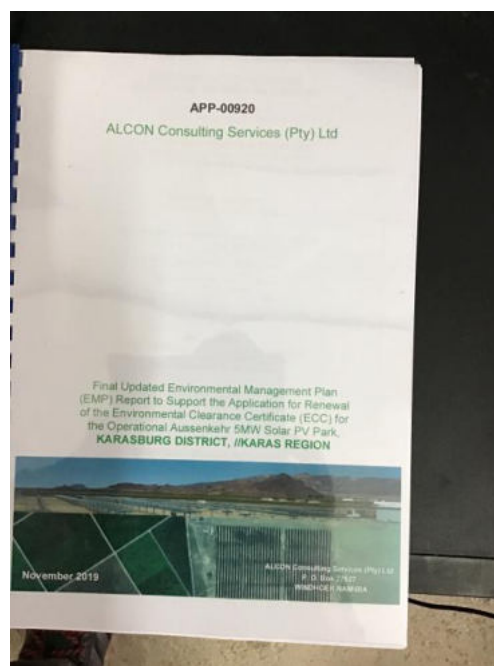


Figure 5 - Emergency response plan and latest updated EMP on site

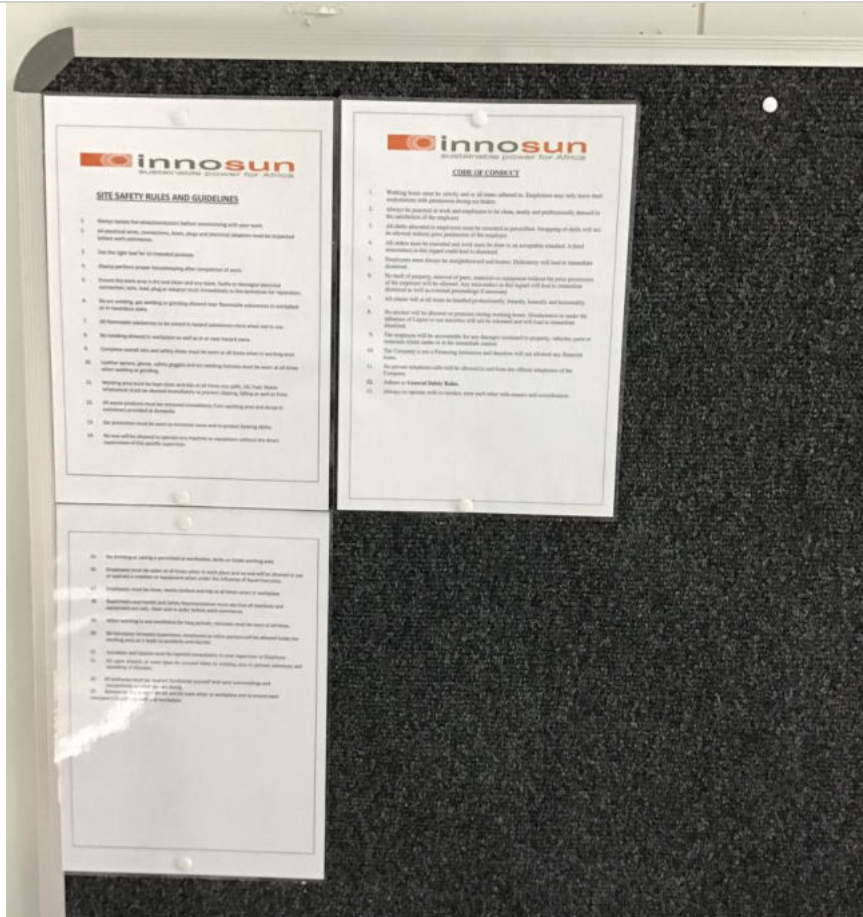


Figure 6 - Safety rules and guidelines adequately presented



Figure 7 - Valid fire hydrant on site

3.1.1. Bi-annual monitoring

An environmental report will be submitted to the Ministry of Environment, Forestry and Tourism biannually reporting on periods from January to June and July to December. These reports report on compliance with regards to the activities taking place on-site, roads or tracks made or used, accommodation structures and infrastructure erected, any rehabilitation done, and any incidents of conflict reported. These reports are attached in Appendix C.

3.1.2 Activities for the monitoring period

During the previous monitoring period during the operational phase from [2020 to 2022] the proponent carried out a variety of activities such as:

- Solar power generation and maintenance (which include cleaning of area around panels and cleaning of solar panels maximum 3 times a year, with a consumption of around 30 000L per cleaning)

3.2 ANNUAL COMPLIANCE AUDIT

Furthermore, the approved EMP covers all adverse environmental impacts, including any additional potential impacts that may result from the activities. The EMP provides the technical details for each mitigation, monitoring and institutional measure, including the

impact(s) to which it relates and the conditions when required, together with designs, equipment descriptions and operating procedures as granted.

3.3 COMPLIANCE AUDIT FINDINGS

This section outlines the findings of the environmental audit completed for the project. It addresses obligations in terms of the key Acts that govern the activities on site, the commitments made in the EMP, and present the findings and recommended corrective actions where applicable (Table 2).

The EMP:

- Identifies all construction and operational activities that could cause environmental damage (risks and potential impacts) and provides a summary of actions required;
- Identifies institutions responsible for ensuring compliance with the EMP and provides their contact information;
- Provides standard procedures to avoid, minimize and mitigate the identified negative environmental impacts and to enhance the positive impact of the proposed activities on the environment;
- Provides for plant rules and actions required;
- Forms a written record of procedures, responsibilities, requirements and rules for contractor/s, their staff and any other person who must comply with the EMP;
- Ensure zero pollution incidents; minimal vegetation clearing, protect local flora, fauna, and water resources; and use water and other natural resources effectively and efficiently.
- Provides a monitoring and auditing program to track and record compliance and identify and respond to any potential or actual negative environmental impacts, and
- Provides a monitoring program to record any mitigation measures that are implemented.
- Ensure that an annual environmental audit is carried out by either MME or MEFT.

3.4 ISSUES OF NON-COMPLIANCE

A few issues of non-compliance were identified:

- Stack heights of boxes in shed pose a fire hazard threat and a safety threat to workers



Figure 8 - Stacked boxes in storage shed

- Presence of rat faeces



Figure 9 - Rat faeces

Table 2 - EMP Audit

Activity	Potential Impacts	Management/Mitigation Measures	Compliance	Comments
<ul style="list-style-type: none"> – People need skills to perform their jobs. the technology to do something is often not found locally. Development of people and technology are key to economic development 	<ul style="list-style-type: none"> – Enhance skills transfer and technology to Aussenkehr and subsequent promotion of economic development 	<ul style="list-style-type: none"> – Training must be provided to Namibians to ultimately employ a predominantly Namibian workforce 	<ul style="list-style-type: none"> – Compliant 	<ul style="list-style-type: none"> – In progress.
<ul style="list-style-type: none"> – New and existing developments attract people seeking work. – The increased trucking and distribution of goods to Aussenkehr 	<ul style="list-style-type: none"> – Increase the extent of informal settlements and its associated problems – Increased spread of HIV/AIDS 	<ul style="list-style-type: none"> – Restricted employment for local Namibians only should be practiced. Deviations from this practice should be justified appropriately. Training of local people should be considered from the start. 	<ul style="list-style-type: none"> – Compliant 	<ul style="list-style-type: none"> – This provision is upheld, with the employment of two locals stationed on site on a daily basis.
<p>Employment and increased electricity to the national grid</p>	<ul style="list-style-type: none"> – The solar park will provide employment to locals as well as increase electricity supply to the national grid 	<ul style="list-style-type: none"> – None required 	<ul style="list-style-type: none"> – Compliant 	<ul style="list-style-type: none"> – Continuously ongoing

Activity	Potential Impacts	Management/Mitigation Measures	Compliance	Comments
Open fires used for cooking	<ul style="list-style-type: none"> - Outbreak of an uncontrolled fire could lead to the spread of fires. 	<ul style="list-style-type: none"> - Open fires should not be allowed on site - All fire precautions and fire control at the site must be in accordance with the relevant SANS regulations or better. - Firefighting measures as per the Material Safety Data Sheets of the products should be adhered to. - All personnel have to be sensitized about responsible fire protection measures and good housekeeping such as the removal of flammable materials including rubbish. - Regular inspections should be carried out to check for these materials at the site. 	<ul style="list-style-type: none"> - Compliant 	<ul style="list-style-type: none"> - Appropriate firefighting training has been provided to active staff members onsite and their training is certified.

Activity	Potential Impacts	Management/Mitigation Measures	Compliance	Comments
Health, safety and security	<ul style="list-style-type: none"> - Risks include work related injuries or exposures to harmful products, theft and sabotage, etc. - Damage to eyesight of operators from reflection of sun panels 	<ul style="list-style-type: none"> - All health and safety standards specified in the labour Act should be complied with. All staff members to be briefed about the potential risks of injuries on site - ensure staff are provided protective sunglasses when working with solar panels - health and safety regulations pertaining to personal protective clothing, first aid kits being available on site, warning signs etc., - selected personnel should be trained in first aid. The contact details of all emergency services must be readily available. - Dermal contact with hydrocarbons must be avoided and all products handled according to their MSDS 	<p>- Partially compliant</p>	<ul style="list-style-type: none"> - Excessive stack height of solar panels in the storeroom should be reduced.
Waste production	<ul style="list-style-type: none"> - The ability of a product to act as a waste which must be cleaned up. These can be soils that become contaminated with fuel. 	<ul style="list-style-type: none"> - See the MSDS for handling hazardous substances. Contaminated fuel products that can no longer be used in the market must be disposed of in the hazardous waste section of a 	<p>- Compliant</p>	<ul style="list-style-type: none"> -

Activity	Potential Impacts	Management/Mitigation Measures	Compliance	Comments
	<ul style="list-style-type: none"> - Domestic waste from bins, offices and ablution facilities 	<ul style="list-style-type: none"> - municipal dump or where possible converted for beneficial use. - All domestic waste should be disposed of regularly to maintain visual orderliness, but more so to not give time for liquid waste to enter the soil substrate. - Contaminated soils can be remediated in accordance with accepted procedures at a site dedicated for this purpose. Liaise with the municipality regarding waste and handling of hazardous waste. 		
Groundwater	<ul style="list-style-type: none"> - Leakages or spills from hazardous material 	<ul style="list-style-type: none"> - Due to the nature of some hazardous materials, they should be disposed of in an appropriate way at an appropriate classified waste disposal facility. 	- Compliant	<ul style="list-style-type: none"> - EMP provisions will continue to be implemented
Visual Impact	<ul style="list-style-type: none"> - This is an impact that affects the aesthetic appearance of the area 	<ul style="list-style-type: none"> - Regular maintenance and general upkeep of the park will ensure continuous low visual impact and maintain the general integrity of the solar park 	- Compliant	<ul style="list-style-type: none"> - EMP provisions will continue to be implemented

Activity	Potential Impacts	Management/Mitigation Measures	Compliance	Comments
Ecosystem impact	<ul style="list-style-type: none"> - Illegal hunting and poaching of wild animals by workers onsite 	<ul style="list-style-type: none"> - All employees should be educated about the value of biodiversity. - Strict conditions prohibiting harvesting and poaching of fauna and flora should be part of employment contracts. - Disciplinary actions to be taken against all employees failing to comply with contractual conditions 	<p>- Compliant</p>	<ul style="list-style-type: none"> - EMP provisions will continue to be implemented
Birds roosting	<ul style="list-style-type: none"> - Birds roosting, foraging and nesting on and around solar panels 	<ul style="list-style-type: none"> - Nesting of birds should be discouraged - changes to buildings should take into account the habitats that can be created inadvertently by certain architectural or engineering designs. - All unnecessary destruction of nests should be avoided. - Enforced anti-poaching measures. - Disciplinary actions to be taken against all employees failing to comply with contractual conditions. - Create awareness on the negative impacts of recording all incidents. 	<p>- Compliant</p>	<ul style="list-style-type: none"> -

Activity	Potential Impacts	Management/Mitigation Measures	Compliance	Comments
Collision of birds on the power line structures	<ul style="list-style-type: none"> – Collision of birds with power line 	<ul style="list-style-type: none"> – Ensure the entire length of the power line is marked with large double loop bird flight diverters to increase the visibility of the line. – Markings should be on the top conductor at 10–15-meter intervals in alternating black and white devices. 	– Compliant	–
Electrocution of birds on the powerline structures	<ul style="list-style-type: none"> – Electrocution of birds on powerline structures 	<ul style="list-style-type: none"> – Each wire on the pole should be “gapped” (an air space safety gap) – Stay wire should all be “gapped” by insulators. – Offset jumpers where possible – T-piece perch must be placed on top of the pole at each bend point and above the transformer structures – Ensure the design does not attract birds for perching etc. 	– Compliant	–
Nesting activity	<ul style="list-style-type: none"> – Bird nesting activity on the powerline structures 	<ul style="list-style-type: none"> – No mitigation for bird nesting activity, but monitoring is essential 	– Compliant	–
Cumulative impacts	<ul style="list-style-type: none"> – Possible cumulative impacts associated with the operational phase 	<ul style="list-style-type: none"> – Addressing each of the individual impacts as discussed and recommended in the EMP would reduce the cumulative impacts. 	– Compliant	–

Activity	Potential Impacts	Management/Mitigation Measures	Compliance	Comments
	included an increased impact on the surrounding environment, especially on bird populations, as a result of poaching or harvesting of park products	<ul style="list-style-type: none"> - Reviewing biannual and annual reports for any new or re-occurring impacts or problems would aid in identifying cumulative impacts and help in planning if the existing mitigations are insufficient 		
Community liaison/Grievance mechanism	<ul style="list-style-type: none"> - Grievances of surrounding community members regarding project implementation 	<ul style="list-style-type: none"> - The community liaison offices should implement a community communication plan which will include a register for public and community grievances - Community regarding the project progress and maintenance should be provided to surrounding and local communities 	- Compliant	-
Waste production	<ul style="list-style-type: none"> - The ability of product to act as a waste which must be cleaned up - Upon decommissioning waste will be produced in the form of building rubble, obsolete equipment and 	<ul style="list-style-type: none"> - Waste must be recycled and those items that cannot be used again must be scrapped in the appropriate manner. - Upon demolition of the buildings and concrete, the rubble must be removed from the property and taken to an approved dumpsite. 	- Compliant	-

Activity	Potential Impacts	Management/Mitigation Measures	Compliance	Comments
	<p>structures, obsolete or residual products and equipment or structures that can be used elsewhere or sold as scrap</p> <ul style="list-style-type: none"> - Solid polluted by hydrocarbons must be treated as hazardous waste 			
Ecology	<ul style="list-style-type: none"> - Operations spanning many years may create new habitat for fauna and flora. - Upon decommissioning these habitats will be destroyed 	<ul style="list-style-type: none"> - Alcon would have to ensure that no new habitat is created for flora and fauna. - Before decommissioning the HSE would need to inspect every structural facility to ensure that the dismantling and removal of any structure would not affect any organism that has been dependent on those structures for survival, shelter or breeding. - Where new habitats were created, that is now occupied by fauna and flora, Alcon must contact MEFT or other appropriate organizations to 	<ul style="list-style-type: none"> - Compliant 	<ul style="list-style-type: none"> - The proponent has not commenced decommissioning

Activity	Potential Impacts	Management/Mitigation Measures	Compliance	Comments
		<p>establish the conservation status of it.</p> <ul style="list-style-type: none"> - The possibility of relocating the fauna and flora must be investigated and executed. Should the species be listed as vulnerable to extinction or worse a meeting should be held with MEFT in order to determine the appropriate handling of the situation. - After decommissioning the site must be restored to its natural condition if the site will not be used for similar future activities 		
Employment	<ul style="list-style-type: none"> - Decommissioning of the solar park may lead to retrenchments or re-location of staff no longer required 	<ul style="list-style-type: none"> - Plan in advance for meeting the labour act requirements for retrenching of staff if required. - Where possible staff can be relocated to other photovoltaic parks that need more staff 	- Compliant	<ul style="list-style-type: none"> - The proponent has not commenced decommissioning
Dust	<ul style="list-style-type: none"> - Dust will be generated during the decommissioning phase and might be aggravated 	<ul style="list-style-type: none"> - It is recommended that regular dust suppression be included in the decommissioning phase when dust becomes an issue. 	- Compliant	<ul style="list-style-type: none"> - The proponent has not commenced decommissioning

Activity	Potential Impacts	Management/Mitigation Measures	Compliance	Comments
	during periods with string winds	<ul style="list-style-type: none"> Personnel should be issued with dust masks for health and safety reasons. 		
Noise	<ul style="list-style-type: none"> Noise pollution will exist due to heavy vehicles accessing the site to collect rubble from demolished building materials. Cranes may be erected for removing the huge storage tanks, hammers, diggers and drills will be used. 	<ul style="list-style-type: none"> Noise levels during this phase should follow the World Health Organization (WHO) guideline on maximum noise levels (Guidelines for community noise, 1999). To prevent hearing impairment. This limits levels in industrial areas to an average of 70dB over a 24-hour period with maximum noise levels not exceeding 110dB during the period. All personnel must be issued with hearing protectors and neighbours must be notified of the time and duration of decommissioning. Notice of the start of the decommissioning should be given to the local authorities with an invitation to give feedback at any time with regards to the noise impact, 	<ul style="list-style-type: none"> Compliant 	<ul style="list-style-type: none"> The proponent has not commenced decommissioning

Activity	Potential Impacts	Management/Mitigation Measures	Compliance	Comments
Visual	<ul style="list-style-type: none"> - This is an impact that affects the aesthetic appearance 	<ul style="list-style-type: none"> - Visual impact could pose one of the most significant impacts. Visual impacts could be limited through keeping all decommissioned areas clean and orderly at all times. Good housekeeping also reduces risk of 	- Compliant	<ul style="list-style-type: none"> - The proponent has not commenced decommissioning
Groundwater, surface water and soil contamination	<ul style="list-style-type: none"> - Porous surface substrate can allow unwanted hazardous and ecologically detrimental substances to seep down to the water table 	<ul style="list-style-type: none"> - All precautions are to be taken to prevent contamination of the soil as this could enter the ecosystem. Leakages from vehicles might occur especially if they are serviced on site. - Care must be taken 	- Compliant	<ul style="list-style-type: none"> - The proponent has not commenced decommissioning
Health, safety and security	<ul style="list-style-type: none"> - During the decommissioning phase similar risks to human beings as with previous phases will be present. All other risks associated with demolitions must be considered 	<ul style="list-style-type: none"> - Proper training of operators - First aid treatment - Medical assistance - Emergency treatment - Manuals and training regarding the correct handling of materials and packages should be in place and updated as new or updated MSDS' become available - 24-hour security surveillance in case of opportunistic activities. 	- Compliant	<ul style="list-style-type: none"> - The proponent has not commenced decommissioning

Activity	Potential Impacts	Management/Mitigation Measures	Compliance	Comments
Fire	<ul style="list-style-type: none"> - Outbreak of an uncontrolled fire due to open fires made by workers onsite while decommissioning the Park. 	<ul style="list-style-type: none"> - The holistic fire protection and prevention plan should still be utilised. Experience has shown that the best chance to rapidly put out a major fire is in the first 5 minutes. - It is important to recognise that a responsive fire prevention plan does not solely include the availability of firefighting equipment, but more importantly, it involves premeditated measures and activities to timeously prevent, curb and avoid conditions that may result in fires. 	<ul style="list-style-type: none"> - Compliant 	<ul style="list-style-type: none"> - The proponent has not commenced decommissioning

4 DECOMMISSIONING AND REHABILITATION

Decommissioning is the process whereby after the plant has reached its end of life and is not upgraded the plant will be dismantled and the land will be remediated. The proponents decommissioning plan outlines the required steps to remove the system, dispose of, recycle of its components, and rehabilitate the land to a state close to its original state. However, the plant is still significantly far from reaching this stage. The Proponent shall continuously and on an annual basis estimate decommissioning costs and provide for such costs in the long-term budgetary allocation for environmental liability.

5 CONCLUSION AND RECOMMENDATIONS

All proposed activities shall be carried out in compliance with the relevant requirements and conditions of the granted licence in accordance with the approved EMP. It is recommended that the Proponent continues to adhere to all environmental legislation and company standards to ensure that best practical environmental protection continues as the project activities progress.

APPENDIX A: ENVIRONMENTAL MANAGEMENT PLAN

APPENDIX B - ENVIRONMENTAL CLEARANCE CERTIFICATE

ECC – 00454 Serial: CPfCqi454



REPUBLIC OF NAMIBIA
MINISTRY OF ENVIRONMENT AND TOURISM
OFFICE OF THE ENVIRONMENTAL COMMISSIONER

ENVIRONMENTAL CLEARANCE CERTIFICATE
ISSUED

In accordance with Section 37(2) of the Environmental
Management Act (Act No. 7 of 2007)

TO
ALCON Consulting Services (Pty) Ltd
P. O. Box 27527, Windhoek, 2 Schutzen Street

TO UNDERTAKE THE FOLLOWING LISTED ACTIVITY
Operational Aussenkehr 5MW Solar PV Park, Karasburg District,
//Karas Region


DEPUTY ENVIRONMENTAL COMMISSIONER

Issued on the date: 2019-12-19
Expires on this date: 2022-12-19

(See conditions printed over leaf)

This certificate is printed without erasures or alterations



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APP-00920

ALCON Consulting Services (Pty) Ltd

**Final Updated Environmental Management Plan
(EMP) Report to Support the Application for Renewal
of the Environmental Clearance Certificate (ECC) for
the Operational Aussenkehr 5MW Solar PV Park,
KARASBURG DISTRICT, //KARAS REGION**



November 2019

**ALCON Consulting Services (Pty) Ltd
P. O. Box 27527
WINDHOEK NAMIBIA**

PROPONENT, LISTED ACTIVITIES AND RELATED INFORMATION SUMMARY

NAME OF THE PROPONENT

ALCON Consulting Services (Pty) Ltd

MINISTRY OF ENVIRONMENT AND TOURISM (MET) ENVIRONMENTAL CLEARANCE CERTIFICATE (ECC) APPLICATION REFERENCE No.

APP-00920

COMPETENT AUTHORITY

Ministry of Mines and Energy (MME)

ADDRESS OF THE PROPONENT AND CONTACT PERSON

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WINDHOEK NAMIBIA

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Chief Operating Officer

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PROJECT TITLE

Renewal of the Environmental Clearance Certificate (ECC)
for the Operational Aussenkehr 5MW Solar PV Park,
Karasburg District, //Karas Region

PROJECT LOCATION

Aussenkehr, Karasburg District, //Karas Region, Southern Namibia
(Latitude: -28.421202, Longitude: 17.464426)
Latitude: 28°25'16.3"S, Longitude: 17°27'51.9"E

ENVIRONMENTAL CONSULTANTS



Risk-Based Solutions (RBS) CC

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ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)

Dr. Sindila Mwiya

PhD, PG Cert, MPhil, BEng (Hons), Pr Eng

Summary Profile and Qualification of the Environmental Assessment Practitioner (EAP) / International Consultant Projects Director – Dr Sindila Mwiya

Dr Sindila Mwiya has more than eighteen (18) years of direct technical industry experience in Environmental Assessment (SEA, EIA, EMP, EMS), Energy (Renewable and Non-renewable energy sources), onshore and offshore resources (minerals, oil, gas and water) exploration / prospecting, recovery and utilisation, covering general and specialist technical exploration and recovery support, Health, Safety and Environment (HSE) permitting for Geophysical Surveys such as 2D and 3D Seismic and Gravity Surveys for mining and petroleum (oil and gas) operations support, through to engineering planning, layout, designing, logistical support, recovery, production / operations, compliance monitoring, rehabilitation, closure and aftercare projects lifecycles.

Through his companies, Risk-Based Solutions (RBS) CC and Foresight Group Namibia (FGN) (Pty) Ltd which he founded, he has undertaken more than 200 projects for local, regional (SADC) and international clients. He continues to work for global reputable resources (petroleum and mining / minerals) and energy companies such as CGG Services UK Limited (UK/ France), BW Offshore (Singapore), Shell Namibia B. V. Limited (Namibia/ the Netherlands), Tullow Oil (UK), Debmarine (DBMN) (Namibia), Reconnaissance Energy Africa Ltd (ReconAfrica) (UK/Canada), Osino Resource Corporation (Canada/Germany/ Namibia), Desert Lion Energy Corporation (Canada/ Australia), Petrobras Oil and Gas (Brazil) / BP (UK), REPSOL (Spain), ACREP (Namibia/Angola), Preview Energy Resources (UK), HRT Africa (Brazil / USA), Chariot Oil and Gas Exploration (UK), Serica Energy (UK), Eco (Atlantic) Oil and Gas (Canada / USA), ION GeoVentures (USA), PGS UK Exploration (UK), TGS-NOPEC (UK), Maurel & Prom (France), GeoPartners (UK), PetroSA Equatorial Guinea (South Africa / Equatorial Guinea), Preview Energy Resources (Namibia / UK), Sintezneftegaz Namibia LTD (Russia), INA Namibia (INA INDUSTRIJA NAFTE d.d) (Croatia), Namibia Underwater Technologies (NUTAM) (Namibia), InnoSun Holding (Pty) Ltd (Namibia / France) and OLC Northern Sun Energy (Pty) Ltd (USA /Namibia). Dr Sindila Mwiya is highly qualified with extensive experience in petroleum, mining, renewable energy (Solar, Wind, Biomass, Geothermal and Hydropower), Non Renewable energy (Coal, Petroleum, and Natural Gas), applied environmental assessment, management and monitoring (Scoping, EIA, EMP, EMP, EMS) and overall industry specific HSE, cleaner production programmes, Geoenvironmental, geological and geotechnical engineering specialist fields.

Dr Sindila Mwiya has undertaken and continues to undertake and manage high value projects on behalf of global and local resources and energy companies. Currently, (2019-2021) Dr Sindila Mwiya is responsible for permitting planning through to operational and completion compliance monitoring, HSE and engineering technical support for multiple major upstream petroleum, minerals, mining and manufacturing operations in different parts of the World including Namibia. He continues to work as an International Resources Consultant, national Environmental Assessment Practitioner (EAP), Engineering / Technical Consultant (RBS / FGN), Project Manager, Programme Advisor for the Department of Natural and Applied Sciences, Namibia University of Science and Technology (NUST) and has worked as a Lecturer, University of Namibia (UNAM), External Examiner/ Moderator, NUST, National (Namibia) Technical Advisor (Directorate of Environmental Affairs, Ministry of Environment and Tourism / DANIDA – Cleaner Production Component) and Chief Geologist for Engineering and Environment Division, Geological Survey of Namibia, Ministry of Mines and Energy and a Field-Based Geotechnician (Specialised in Magnetism, Seismic, Gravity and Electromagnetics Exploration and Survey Methods) under the Federal Institute for Geoscience and Natural Resources (BGR) German Mineral Exploration Promotion Project to Namibia, Geophysics Division, Geological Survey of Namibia, Ministry of Mines and Energy.

He has supervised and continues to support a number of MScs and PhDs research programmes and has been a reviewer on international, national and regional researches, plans, programmes and projects with the objective to ensure substantial local skills development pivotal to the national socioeconomic development through the promotion of sustainable natural resources coexistence developmental and resources recovery approaches, utilisation, management and for development policies, plans, programmes and projects financed by governments, private investors and donor organisations. Since 2006 until 2017, he has provided extensive technical support to the Department of Environmental Affairs (DEA), Ministry of Environment and Tourism (MET) through GIZ and continued to play a significant role in the amendments of the Namibian Environmental Management Act, 2007, (Act No. 7 of 2007), preparation of new Strategic Environmental Assessment (SEA) Regulations, preparation of the updated Environmental Impact Assessment (EIA) Regulations as well as the preparation of the new SEA and EIA Guidelines and Procedures all aimed at promoting effective environmental assessment and management practices in Namibia.

Among his academic achievements, Dr Sindila Mwiya is a holder of a PhD (Geoenvironmental Engineering and Artificial Intelligence) – Research Thesis: Development of a Knowledge-Based System Methodology (KBSM) for the Design of Solid Waste Disposal Sites in Arid and Semiarid Environments focusing on Namibia, MPhil/PG Cert and BEng (Hons) (Engineering Geology and Geotechnics), qualifications from the University of Portsmouth, School of Earth and Environmental Sciences, United Kingdom. During the 2004 Namibia National Science Awards, organised by the Namibian Ministry of Education, and held in Windhoek, Dr Sindila Mwiya was awarded the Geologist of the Year for 2004, in the professional category. Furthermore, as part of his professional career recognition, Dr Sindila Mwiya is a life member of the Geological Society of Namibia, Consulting member of the Hydrogeological Society of Namibia and a Professional Engineer registered with the Engineering Council of Namibia.

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EXECUTIVE SUMMARY

ALCON Consulting Services (Pty) Ltd (the Proponent) has developed the Aussenkehr 5MW Solar PV Park connected to the national grid via the NamPower Aussenkehr Substation. The Solar PV Park covering 15 Ha piece of private farmland is situated to the east of the settlement of Aussenkehr, Karasburg West Constituency, Karasburg District, //Karas Region. The site is accessible through private access road that comes off the C13 road linking Rosh Pinah and Noordoewer.

The construction of now operational Aussenkehr 5MW Solar PV Park was implemented after the Proponent has obtained all the applicable legal documentations as required under various national regulations. This updated Environmental Management Plan (EMP) Report has been prepared based on the environmental monitoring and previous assessment and management plan reports that were prepared in 2016 and used to support the application for Environmental Clearance Certificate (ECC) for this project. This updated EMP Report has been prepared in order to support the application for the renewal of the now expired ECC that was issued on the 8th April 2016.

This updated Environmental Management Plan (EMP) provides a detailed plan of action required in the implementation of the mitigation measures for minimising and maximising the identified negative and positive impacts respectively. The EMP also provides for the management actions with roles and responsibilities requirements for implementation by the Proponent (ALCON Consulting Services (Pty) Ltd) or through the contractor involved in the operational, abandonment and decommissioning of the Solar PV Park. The EMP gives commitments including financial and human resources provisions for effective implementation of the EMP and management of the likely environmental liabilities throughout the lifecycle of this Solar PV Park. Regular assessments and evaluation of the environmental liabilities during the operational stage will need to be undertaken and will ensure adequate provision of the necessary resources towards good environmental management at various stages of the project lifecycle.

Based on the assessment of both negative and positive impacts undertaken for the Aussenkehr 5MW Solar PV Park project, a number of high positive and localised negative impacts were identified. Mitigation measures for the negative impacts have been proposed and management strategies are provided in this Environmental Management Plan (EMP) covering the operational and decommissioning closure / upgrade stages of the Aussenkehr 5MW Solar PV Park.

The implementation of this EMP by the ALCON Consulting Services (Pty) Ltd as a part of the management of the impacts covers the entire lifecycle (operational and decommissioning closure / upgrade stages) of the of now operational Aussenkehr 5MW Solar PV Park.

All the responsibilities to ensure that the recommendations of this EMP Report are executed accordingly, rest with the **ALCON Consulting Services (Pty) Ltd (the Proponent)**. The company must provide all appropriate human and financial resources required for the implementation of this EMP.

Key recommendations are provided in Chapter 5 of this report and it is the responsibility of ALCON Consulting Services (Pty) Ltd to make sure that all members of the workforce including the stakeholders, contractors and subcontractors' workers are all aware of the provisions of this EMP Report and its objectives.

1. PROJECT BACKGROUND

1.1 Introduction

ALCON Consulting Services (Pty) Ltd (the Proponent) has developed the Aussenkehr 5MW Solar PV Park connected to the national grid through the NamPower Aussenkehr Substation. The Aussenkehr 5MW Solar PV Park is situated east of the settlement of Aussenkehr in the Karasburg West Constituency, Karasburg District, //Karas Region (Fig. 1.1).

The Solar PV Park covering 15 Ha is located on a 24 Ha leased portion of the private Farm Aussenkehr No. 147 (Fig. 1.2). The site is accessible through private access road that comes off the C13 road linking Aussenkehr to Rosh Pinah in the west and Noordoewer to the east (Figs. 1.1 -1.3).

1.2 Summary of the Developed Process

The construction of now operational Aussenkehr 5MW Solar PV Park was implemented after the Proponent has obtained the following documentations in accordance with the provisions of all the applicable the national regulations (See Chapter 2 of this Report):

- (i) Generation License (GL) issued by the Electricity Control Board (ECB), as approved by the Ministry of Mines and Energy (MME)
- (ii) Power Purchase Agreement (PPA) between the Proponent and the consumer (NamPower) of the electricity to be generated by the Solar PV Park,
- (iii) Land Lease Agreement between the Proponent and the private land owner of Farm Aussenkehr No. 147; and
- (iv) Environmental Clearance Certificate (ECC) issued by the Environmental Commissioner in the Ministry of Environment and Tourism (MET).

1.3 Objective of this Updated EMP

This updated Environmental Management Plan (EMP) Report has been prepared based on the environmental monitoring undertaken by the Proponent and the assessment and management plan reports that were prepared by the Environmental Consultants GeoPolution Technologies (Pty) Ltd dated February 2016 and used to support the application for ECC for this project.

A copy of the now expired ECC that was issued on the 8th April 2016 is shown in Fig. 1.4. This updated EMP Report has been prepared in order to support the application for the renewal of this ECC with respect to the operational and decommissioning closure / upgrade stages of the Aussenkehr 5MW Solar PV Park.

1.4 Project Summary

Solar energy systems produce energy by converting solar irradiation into electricity or heat. Photovoltaic (PV) facilities use PV panels comprising modules. Modules comprise many individual PV cells which absorb solar energy. The absorbed solar energy excites electrons inside the cells and produces electrical energy.

The panels are joined together in rows to form PV arrays. Which produces electricity in Direct Current (DC). The feeding of electricity into the NamPower grid requires the transformation of DC (as produced) into Alternating Current (AC) by an inverter.

The general site layout of the Aussenkehr 5MW Solar PV Park is shown in Figs. 1.3 -1.5. The current site as shown in Fig. 1.2 falls within the 24Ha leased area extent while the actual solar park occupies 15 Ha (Figs. 1.2 and 1.3 and 1.5 - 1.7).

The project commenced with the 15ha large scale Earth Works in March 2017 was completed and commissioned on the 20th November 2017 (Plates 1.1 and 1.2). The major part of the engineering construction work was construction of the 36 rows of One-Dimensional Ideematec Tracking System and the installation of the 19 400 high efficiency Poly-Crystalline. The solar panels are assembled on a ground mounted substructure which will follow the sun by using a very robust horizontal single-axis-tracker. This tracker solution ensures very high energy yields over the whole day.

The PV panels will each produce an output of 315 W and are mounted on the tracking structures, approximately 4 m in height from the ground. The solar park uses a decentralised inverter concept which allows for easy maintenance and economic spare part management. The inverter is the heart of a solar power installation.

The 22-kV powerline from the new grid connection substation connects this Solar PV Park to the existing Aussenkehr Substation west of the site (Fig. 1.3).

The site has a very high standard of all the necessary supporting infrastructures such as external and internal site road accesses covered in dust suppressing loose crushed gravel, high boundary fence, security cameras, onsite security personnel and related solar park infrastructures.

The following is the summary of the key components of the now operational Aussenkehr 5MW Solar PV Park as covered in this updated Environmental Management Plan (EMP) Report:

- ❖ PV solar panels/modules (arranged in arrays);
- ❖ PV module mountings;
- ❖ DC (direct current)-AC (alternating current) inverters and transformers;
- ❖ New grid connection substation;
- ❖ Underground cabling;
- ❖ Overhead power lines;
- ❖ Operations and maintenance building;
- ❖ Guardhouse;
- ❖ Access roads and internal road network, and;
- ❖ Ancillary infrastructure.

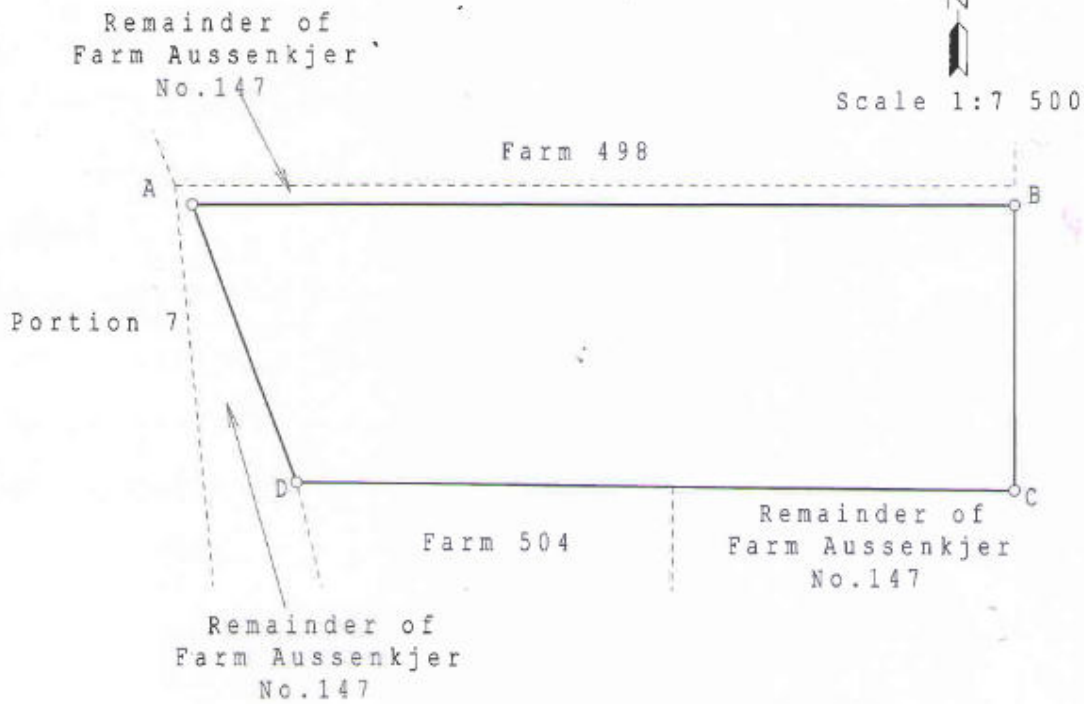


Figure 1.1: Regional location of the Aussenkehr 5MW Solar PV Park.

Sides	Distances (metres)	Angles of Direction	CO-ORDINATES			Design.
			Y	System:22/17	X	
A B	862,96	269 55 04	A	-45 273,67	+711 207,82	8Agn
B C	300,72	359 55 00	B	-46 136,63	+711 206,58	7Ag
C D	753,70	90 27 25	C	-46 137,07	+711 507,30	9Ag
D A	313,31	159 30 00	D	-45 383,39	+711 501,29	Ag5
		Uhabis	▲	-65 354,05	+706 808,77	No.27
		Quartzite	▲	-38 935,81	+720 652,95	No.18

Description of Beacons

All.....20mm Round Iron Peg



The figure A B C D represents
24,0016 hectares of land being

Farm 497
(a Portion of the Farm Aussenkjer No.147)

Situate in the Settlement Area
of the Farm Aussenkjer No.147

Registration Division V
Karas Region

Republic of Namibia

Surveyed between August 2015 and September 2016 by me

Pateh
Land Surveyor
R.T Nyatoti
(Reg.No.048)

This diagram is annexed to No.	The original diagram is No. A34/1950	S.R.E201/2016
	CRT : No.63/1950	Noting Plan:GG-N
Registrar of deeds	Dated : 29-01-1951	File No.:V147
		Lat: -28' 21'
		Long: 17' 24'

Figure 1.2: Detailed outlined of the Portion of Farm Aussenkehr No. 147 used for the 5MW Solar PV Park (Source: ALCON, 2019).



Figure 1.3: Detailed location of the Aussenkehr 5MW Solar PV Park (Source: Google Earth, 2019).



REPUBLIC OF NAMIBIA

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04 April 2016

OFFICE OF THE ENVIRONMENTAL COMMISSIONER

Tironenn Kauluma
The Managing Director
Alcon Consulting Services (Pty) Ltd
P.O. Box 99202
Windhoek
Namibia

Dear Sir /Madam

SUBJECT: ENVIRONMENTAL CLEARANCE CERTIFICATE FOR THE ENVIRONMENTAL ASSESSMENT AND ENVIRONMENTAL MANAGEMENT PLAN FOR THE PROPOSED AUSSENKEHR SOLAR PLANT, KARAS REGION

The Environmental Scoping Report and Environmental Management Plan submitted is sufficient as it made provisions of the environmental management concerning the project's activities. From this perspective regular environmental monitoring and evaluations on environmental performance should be conducted. Targets for improvements should be established and monitored throughout this process.

This Ministry reserves the right to attach further legislative and regulatory conditions during the operational phase of the project.

On the basis of the above, this letter serves as an environmental clearance for the project to commence. However, this clearance letter does not in any way hold the Ministry of Environment and Tourism accountable for misleading information, nor any adverse effects that may arise from this project's activities. Instead, full accountability rests with Alcon Consulting Services and their consultants.

This environmental clearance is valid for a period of 3 (three) years, from the date of issue unless withdrawn by this office.

Yours sincerely,



Teofilus Nghitila
ENVIRONMENTAL COMMISSIONER



"Stop the poaching of our rhinos"

All official correspondence must be addressed to the Permanent Secretary

Figure 1.4: Copy of the now expired ECC that was issued on the 8th April 2016. This updated EMP has been prepared in order to support the application for the renewal of this ECC.

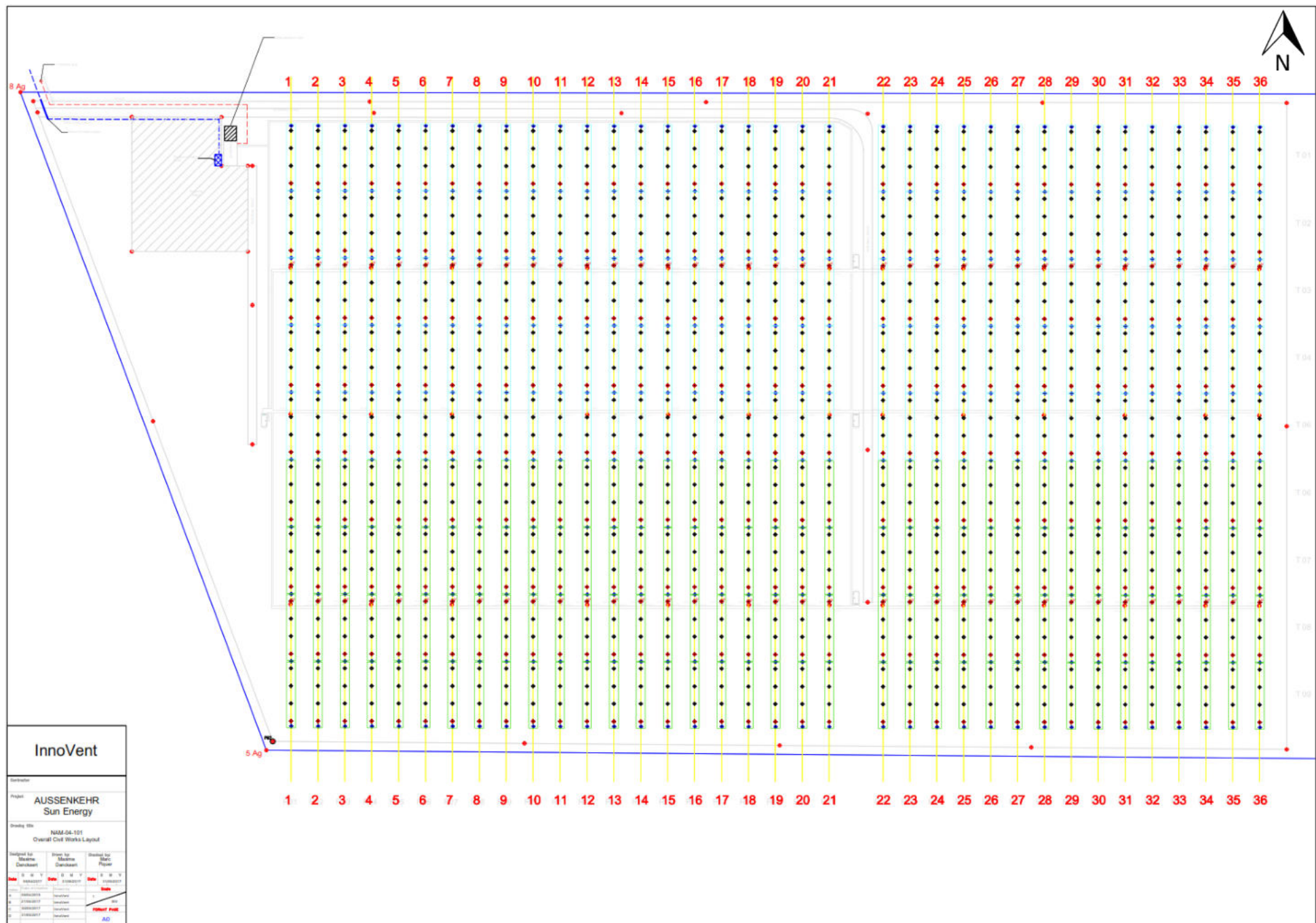


Figure 1.5: Detailed technical layout of the Aussenkehr 5MW Solar PV Park (Source: ALCON, 2019).



Figure 1.6: Overview of the land used for the Aussenkehr 5MW Solar PV Park before construction (Source: Google Earth, 2019).



Plate 1.1: The Aussenkehr 5MW Solar PV Park under construction (Source: ALCON, 2019).

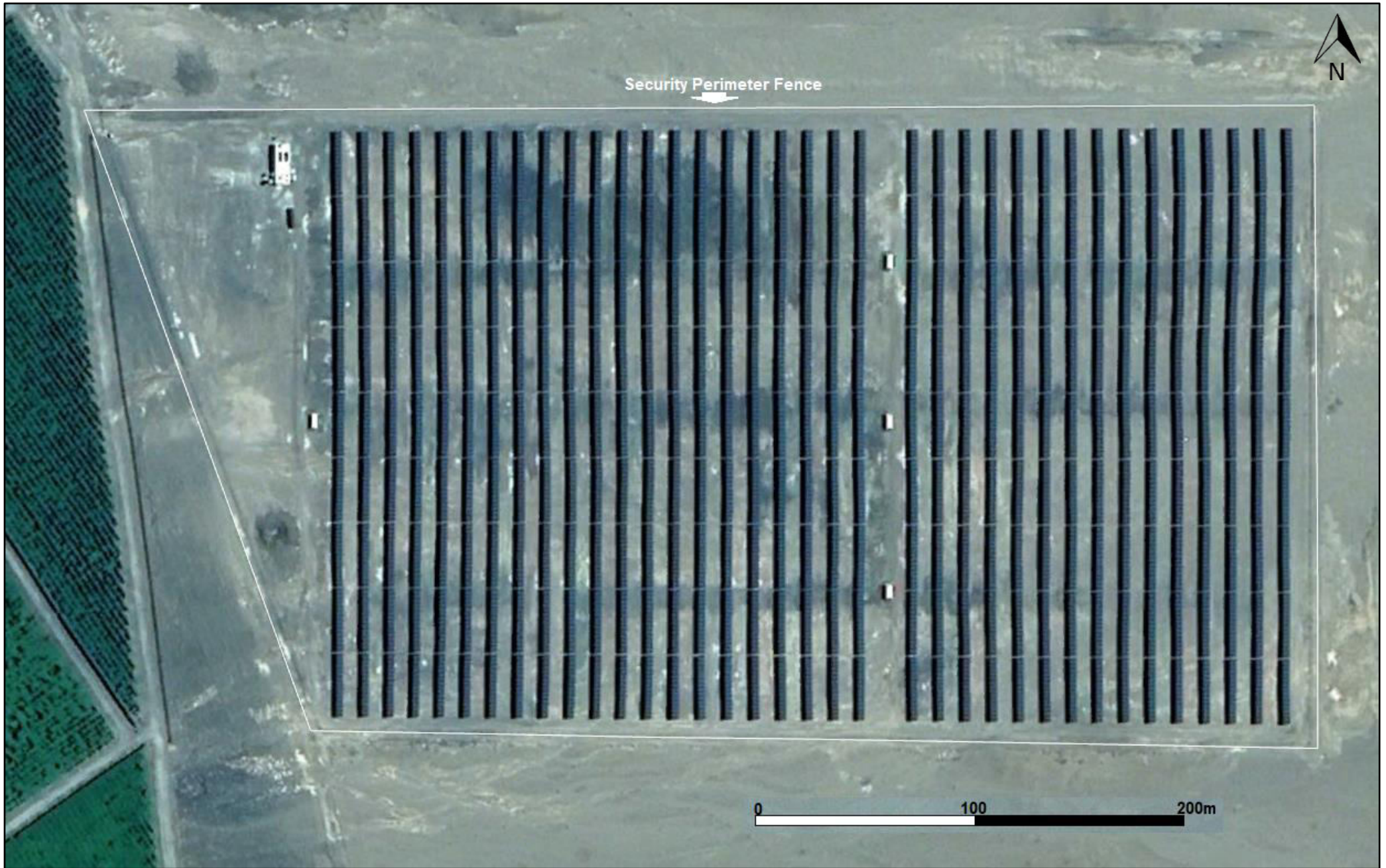


Figure 1.7: Overview of the Aussenkehr 5MW Solar PV Park after construction (Source: Google Earth, 2019).



Plate 1.2: The operational Aussenkehr 5MW Solar PV Park (Source: ALCON, 2019).

2. REVIEW OF LEGISLATION AND IMPACT ASSESSMENT

2.1 Review of Regulatory Framework

The Electricity Act, 2000 (Act No. 2 of 2000), Electricity Act 2007 (Act No. 4 of 2007) and the Environmental Management Act, 2007, (Act No. 7 of 2007) as well as the associated regulations are the key the legislations linked to the licenses, permits, authorisations and certificates requirements for the Aussenkehr 5MW Solar PV Park (Table 2.1 – 2.3).

Table 2.1: Summary of the legislative framework applicable to the Aussenkehr 5MW Solar PV Park.

LAW	DESCRIPTION
<p>Constitution of the Republic of Namibia, 1990</p>	<p>The Constitution is the supreme law in Namibia, providing for the establishment of the main organs of state (the Executive, the Legislature and the Judiciary) as well as guaranteeing various fundamental rights and freedoms. Provisions relating to the environment are contained in Chapter 11, Article 95, which is entitled “promotion of the Welfare of the People”. This article states that the Republic of Namibia shall –</p> <p>“actively promote and maintain the welfare of the people by adopting, inter alia, policies aimed at ... maintenance of ecosystems, essential ecological processes and biological diversity of Namibia and utilisation of living natural resources on a sustainable basis for all Namibians, both present and future; in particular, the Government shall provide measures against the dumping or recycling of foreign nuclear waste on Namibian territory.”</p>
<p>Electricity Act, 2000 (Act No. 2 of 2000)</p>	<p>To provide for the establishment and functions of the Electricity Control Board; and to provide for matters incidental thereto</p>
<p>Electricity Regulations: Administrative (Electricity Act, 2000)</p>	<p>The Minister of Mines and Energy has under section 39 of the Electricity Act, 2000 (Act No. 2 of 2000) made the regulations set out in the Schedule which shall come into effect on the date of publication of this notice. The Act commenced on 12 July 2000</p>
<p>Electricity Act 2007 (Act No. 4 of 2007)</p>	<p>Provides for a wide electricity industry including- “to exercise control over the electricity supply industry and to regulate the generation, transmission, distribution, use, import and export of electricity in accordance with prevailing Government policy so as to ensure order in the efficient supply of electricity.</p>
<p>Environmental Management Act (2007)</p>	<p>The purpose of the Act is to give effect to Article 95(l) and 91(c) of the Namibian Constitution by establishing general principles for the management of the environment and natural resources; to promote the co-ordinated and integrated management of the environment; to give statutory effect to Namibia’s Environmental Assessment Policy; to enable the Minister of Environment and Tourism to give effect to Namibia’s obligations under international conventions. In terms of the legislation it will be possible to exercise control over certain listed development activities and activities within defined sensitive areas. The listed activities in sensitive areas require an Environmental Assessment to be completed before a decision to permit development can be taken. The legislation describes the circumstances requiring Environmental Assessments. Activities listed as per the provisions of the Act will require Environmental Assessment unless the Ministry of Environment and Tourism, in consultation with the relevant Competent Authority, determines otherwise and approves the exception.</p>
<p>Water Resources Management Act, 2004</p>	<p>Although not yet implemented, this is the principal law deals with water resources management in Namibia. A key objective of the Act is <i>to provide for the management, development, protection, conservation, and use of water resources.</i></p> <p>Part I of the Act deals with Preliminary Provisions and under section 3 addresses fundamental principles. Relevant principles include; - harmonisation of human needs with environmental ecosystems and the species that depend upon them, while recognising that those ecosystems must be protected to the maximum extent; management of water resources so as to promote sustainable development; prevention of water pollution, and the polluter’s duty of care and liability to make good; and meeting Namibia’s international obligations (e.g. Ramsar and CBD) and promoting respect for Namibia’s rights with regard to internationally shared water resources and, in particular, to the abstraction of water for beneficial use and the discharge of polluting effluents.</p>

Table 2.1: *Cont.*

LAW	DESCRIPTION
Hazardous Substance Ordinance 14 of 1974	Provisions for hazardous waste are amended in this act as it provides “for the control of substances which may cause injury or ill-health to or death of human beings by reason of their toxic, corrosive, irritant, strongly sensitizing or flammable nature or the generation of pressure thereby in certain circumstances; to provide for the prohibition and control of the importation, sale, use, operation, application, modification, disposal or dumping of such substance; and to provide for matters connected therewith”
Atmospheric Pollution Prevention Ordinance 11 of 1976;	This regulation sets out principles for <i>the prevention of the pollution of the atmosphere and for matters incidental thereto</i> . Part III of the Act sets out regulations pertaining to atmospheric pollution by smoke. While preventative measures for dust atmospheric pollution are outlined in Part IV and Part V outlines provisions for Atmospheric pollution by gases emitted by vehicles.
The Nature Conservation Ordinance, Ordinance 4 of 1975,	This Ordinance covers game parks and nature reserves, the hunting and protection of wild animals (including game birds), problem animals, fish and the protection of indigenous Parks.
Conservation Amendment Act 5 of 1996	The Nature Conservation Amendment Act 5 of 1996 amends the Nature Conservation Ordinance, 1975, so as to provide for an economically based system of sustainable management and utilization of game in communal areas; to delete references to representative authorities; and to provide for matters incidental thereto.
The Labour Act, 2007 (Act No. 11 of 2007)	The labour Act gives effect to the constitutional commitment of Article 95 (11), to promote and maintain the welfare of the people. This Act is aimed at establishing <i>a comprehensive labour law for all employees; to entrench fundamental labour rights and protections; to regulate basic terms and conditions of employment; to ensure the health, safety and welfare of employees</i> under which provisions are made in chapter 4. Chapter 5 of the act improvises on the <i>protection of employees from unfair labour practice</i> .
National Heritage Act (27 of 2004)	The principal instrument of legal protection for archaeological sites or remains in Namibia. PART I: In terms of the Act, “heritage” is restricted to places and objects, including those of archaeological, cultural, historical, scientific and social significance. The legislation does not address what is sometimes known as “intangible heritage”, such as customs, beliefs and oral history.

Table 2.2: Government agencies regulating environmental protection in Namibia.

AGENCY	RESPONSIBILITY
Ministry of Environment and Tourism (MET)	Issue of Environmental Clearance Certificate (ECC) based on the review and approval of the Environmental Assessments (EA) reports comprising Environmental Scoping, Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) prepared in accordance with the Environmental Management Act (2007) and the Environmental Impact Assessment Regulations, 2012
Ministry of Mines and Energy (MME)	The Competent Authority for electricity generation activities in Namibia. Approves Generations License as issued by the Electricity Control Board (ECB) in terms of the provisions of the Electricity Act 2007 (Act No. 4 of 2007)
Ministry of Agriculture, Water and Forestry (MAWF)	The Directorate of Resource Management within the Department of Water Affairs (DWA) at the MAWF is currently the lead agency responsible for management of surface and groundwater utilisation through the issuing of abstraction permits and waste water disposal permits. DWA is also the Government agency responsible for water quality monitoring and reporting. The National Botanical Research Institute’s (NBRI) mandate is to study the flora and vegetation of Namibia, in order to promote the understanding, conservation and sustainable use of Namibia’s Parks for the benefit of all. The Directorate of Forestry (DOF) is responsible for issuing of forestry permits with respect to harvest, transport, and export or market forest resources.
Ministry of Labour, Industrial Relation and Employment Creation	Regulations relating to the health and safety of employees at work

Table 2.3: Permit / authorisation requirements for the operational Aussenkehr 5MW Solar PV Park.

ACTIVITY	APPLICABLE LEGISLATION	PERMITTING AUTHORITY	CURRENT STATUS
Generation Licence (GL)	Electricity Act 2007 (Act No. 4 of 2007)	Electricity Control Board through approval by MME Ministry of Mines and Energy (MME)	GL issued and valid for twenty-five (25) years
Environmental Clearance Certificate (ECC)	Management Act, 2007, (Act No. 7 of 2007)	Ministry of Environment and Tourism (MET)	ECC issued in April 2016 and valid for three (3) years. Current ECC expired and hence the preparation of this Updated EMP to support the renewal
Land Rights covering the operational Solar Park Area	None	Private Land	Lease Agreement in Place
Construction, alteration of waterworks with capacity to hold in excess of 20, 000 L	Water Resources Management Act, 2004 (No. 284 of 2004).	Ministry of Agriculture, Water and Forestry	No Permits Required
Abstraction of water other than that provided by NamWater.			
Discharge of effluents or construction of effluent facility			
Protection of archaeological and heritage resources	National Heritage Act (27 of 2004)	National Heritage Council	No known archaeological, cultural, historical, scientific and social significance resources onsite
Removal, disturbances or destruction of bird eggs.	Nature Conservation Ordinance 4, 1975.	Ministry of Environment and Tourism (MET)	No removals
Removal, disturbance of protected Parks.			
Removal, destruction of indigenous trees, bushes or Parks within 100 yards of stream or watercourse.	Forestry Act, 12 of 2001.	Ministry of Water Affairs and Forestry (MWAFF)	
Scheduled processes in controlled area.	Atmospheric Pollution Prevention Ordinance 11 of 1976	Ministry of Health and Social Services.	No Permits Required
Discarding or disposing of used oil.	Petroleum (Exploration and Production) Act 1991 (Act 2 of 1991)	Ministry of Mines and Energy (MME).	Not required
Operating a petroleum consumer installation.	Regulation 16 (2001) Petroleum Regulations.		

2.2 Summary Review of Impact Assessment Results

2.2.1 Project Activities

The following is the summary of the key activities associated with the preconstruction, construction, operational and decommissioning stages of the now operational Aussenkehr 5MW Solar PV Park that have been considered in the impact assessment as potential sources of impacts:

- ❖ Access roads preparation;
- ❖ Cabling linking the solar park to the substation and running next to the existing infrastructure;
- ❖ Underground cable trenching;
- ❖ Site clearing and preparation ;
- ❖ Fencing;

- ❖ Soil / Ground preparation;
- ❖ Power line connectivity;
- ❖ Foundation;
- ❖ Posts driving works;
- ❖ Structure mounting;
- ❖ Module clamping;
- ❖ DC wiring and electrical equipment installation;
- ❖ AC electrical works;
- ❖ Installation of Communication Monitoring;
- ❖ Commissioning;
- ❖ Soar Energy Generation and Maintenance (for 25 Years);
- ❖ Decommissioning (After 25 Years) / Upgrade of Facility.

2.2.2 Summary Review of Key Issues and Significant Impact

The following is the summary of the key issues that have been considered in the EIA processes with respect to the likely impacts (without mitigations) that the Aussenkehr 5MW Solar PV Park activities will have on the receiving environment during the preconstruction, construction, operation and decommissioning stages:

- ❖ Land Use Impacts (Impact: *Very low*, Significant: *Negligible*);
- ❖ Surficial geology (Impact: *Localised low*, Significant: *Low*);
- ❖ Water Use and Quality (Impact: *Very low*, Significant: *Negligible*);
- ❖ Faunal loss (Impact: *Localised low*, Significant: *Low*);
- ❖ Flora loss (Impact: *Localised low*, Significant: *Low*);
- ❖ Landscape and Visual Change (Impact: *Localised low*, Significant: *Negligible*);
- ❖ Light Reflection (Impact: *Very low*, Significant: *Negligible*);
- ❖ Ground Conditions Contamination (Impact: *Localised low*, Significant: *Negligible*);
- ❖ Noise and Vibration (Impact: *Localised low*, Significant: *Negligible*);
- ❖ Air Quality (Impact: *Localised low*, Significant: *Negligible*);
- ❖ Cultural and Paleontological Resources (Impact: *Very low*, Significant: *Negligible*);
- ❖ Socioeconomic (Impact: *High*, Significant: *High*);
- ❖ Electrical Safety (Impact: *Localised low*, Significant: *Negligible*);

- ❖ Occupational Health and Safety (Impact: Localised low, Significant: Negligible);
- ❖ Public Access (Impact: Localised low, Significant: Negligible);
- ❖ Waste Management (Impact: Localised low, Significant: Negligible) during the preconstruction, constructions and operational stage and (Impact: Localised low, Significant: medium) during the decommissioning stage.

2.2.3 Review of the Overall the Results of the Significant Impact

Overall the results of the significant impact assessment impacts results of the now operational Aussenkehr 5MW Solar PV Park is of low impact on the biological environmental (fauna, flora and habitant) with respect to the activities of the preconstruction, constructions and operational stage. The decommissioning stage will have low to medium high impact mainly due to potential high cost and high volumes of solid waste that may be generated.

3. THE EMP FRAMEWORK

3.1 Summary of the EMP Objectives

The Environmental Management Plan (EMP) provides a detailed plan of action required in the implementation of the mitigation measures for minimising and maximising the identified negative and positive impacts respectively. The EMP gives commitments including financial and human resources provisions for effective management of the likely environmental liabilities associated with the now operational Aussenkehr 5MW Solar PV Park covering the operational and decommissioning closure / upgrade stages. Regular assessments and evaluation of the environmental liabilities shall be undertaken to ensure adequate provision of the necessary resources towards good environmental management at various stages of the now operational Aussenkehr 5MW Solar PV Park.

3.2 Operational and Decommissioning Mitigation Measures

Based on the findings and recommendations of the previous assessment and management reports prepared in 2016 as well as the review of the current operational activities and future decommissioning, closure / upgrade requirements of the now operational Aussenkehr 5MW Solar PV Park, the key specific mitigations measures covering the operational and decommissioning closure / upgrade stages are provided in Tables 3.1 and 3.2. The mitigation Tables 3.1 and 3.2 for the operational and decommissioning for closure / upgrade respectively, provide for mitigation criteria, nature mitigation, monitoring and responsible body.

3.3 Abandonment and Decommissioning Plan

The now operational Aussenkehr 5MW Solar PV Park has a generation license that is valid for period of twenty-five (25) years. Once the license expires, it may be renewed subjected to the prevailing regulatory framework and technological requirements at that time. Abandonment may occur when a solar array is inactive for a certain period of time, therefor not licensed or technological not possible to produce electricity and such a solar array may be upgraded with the latest technology or decommissioned. Decommissioning is the process for removing an abandoned solar panel system and remediating the land. A decommissioning plan outlines required steps to remove the system, dispose of or recycle its components, and restore the land to its original state (Table 3.2). Financial security for decommissioning must be provided during the operational stage of a solar array covering the following:

- ❖ Remove rack wiring and panels;
- ❖ Dismantling of the racks;
- ❖ Remove electrical equipment;
- ❖ Breakup and remove concrete pads or ballasts;
- ❖ Remove racks, cable, ground screws and power poles and fence;
- ❖ Grading and levelling / seeding;
- ❖ Seed disturbed areas;
- ❖ Transportation of useable materials for reselling / recycling centres, and;
- ❖ Transportation of all the solid waste to approved municipal solid waste disposal site.

The Proponent shall continuously and on an annual basis estimate decommissioning costs and provide for such costs in the long-term budgetary allocation for environmental liability. The current estimated cost decommissioning without long-term inflation is around NAD 2.1 million.

Table 3.1: Operational stage mitigation measures.

Criteria	Nature	Mitigation	Monitoring	Responsible Body
Enhanced skills transfer and technology transfer to Aussenkehr and subsequent promotion of economic development	People need skills to perform their jobs. The technology to do something is often not found locally. Development of people and technology are key to economic development.	Training must be provided to Namibians to ultimately employ a predominantly Namibian workforce.	Annual summary report based on actual training and the enhancement of skills and transfer of technology should be compiled.	Proponent; Directors & Public Relations personnel
Increased spread of HIV/AIDS; Increased influx to Aussenkehr; Increased informal settlement and associated problems	New and existing developments attract people who seek work. This in turn can increase the extent of informal settlements and its associated problems. The increased trucking and distribution of goods to Aussenkehr could contribute to the spread of HIV / AIDS.	Restricted employment for local Namibians only should be practiced. Deviations from this practice should be justified appropriately. Training of local people should be considered from the start.	Annual summary report based on educational programmes and training conducted. Annual report and review of employee demographics.	Proponent; Directors & Public Relations Personnel
Employment and increased electricity national grid	The solar Park will provide employment to locals as well as increase electricity supply to the national grid.	None required.	Annual summary report based on employee records. Annual summary report based on electricity volumes generated.	Proponent; Directors & Public Relations Personnel
Fire	Outbreak of an uncontrolled fire. Open fires used for cooking that are not controlled could lead to the spread of fires.	Open fires should not be allowed on site. Fire Fighting and Fire Prevention: All fire precautions and fire control at the site must be in accordance with relevant SANS regulations or better. Firefighting measures as per the Material Safety Data Sheets of the products should be adhered to. In addition to this, all personnel have to be sensitised about responsible fire protection measures and good housekeeping such as the removal of flammable materials	A report should be compiled every 6 months of all incidents reported. The report should contain dates when fire drills were conducted and when fire equipment was tested.	Proponent

Table 3.1: *Cont.*

Criteria	Nature	Mitigation	Monitoring	Responsible Body
		including rubbish. Regular inspections should be carried out to check for these materials at the site.		
Health, Safety & Security	<p>Risks include work related injuries or exposures to harmful products, theft and sabotage.</p> <p>Damage to eye sight of operators from refecction of sun on panels.</p>	<p>All Health and Safety standards specified in the Labour Act should be complied with.</p> <p>All staff members to be briefed about the potential risks of injuries on site.</p> <p>Ensure that staff are provided protective sunglasses when working with solar panels.</p> <p>Adhere to the following:</p> <ul style="list-style-type: none"> Health and Safety Regulations pertaining to personal protective clothing, first aid kits being available on site, warning signs, etc.; Selected personnel should be trained in first aid. The contact details of all emergency services must be readily available; Dermal contact with hydrocarbons must be avoided and all products handled according to their MSDS. 	<p>Inventory of necessary information and administrative documentation to be kept on a weekly basis.</p> <p>A report should be compiled every 6 months of all incidents reported. The report should contain dates when training were conducted and when safety equipment and structures were inspected and maintained.</p>	Proponent
Waste Production	The ability of a product to act as a waste which must be cleaned up. These can be soils that become contaminated with fuel. Domestic waste from bins, offices and ablution facilities.	<p>See the MSDS for handling hazardous substances. Contaminated fuel products that can no longer be used in the market must be disposed of in the hazardous waste section of a municipal dump or where possible converted for beneficial use.</p> <p>All other domestic waste should be disposed of regularly to maintain visual orderliness, but more so to not give time for liquid waste to enter the soil substrate.</p> <p>Contaminated soils can be remediated in accordance with accepted procedures at a site dedicated for this purpose.</p> <p>Liaise with the municipality regarding waste and handling of hazardous waste.</p>	<p>A register of hazardous waste disposal should be kept. This should include type of waste, volume as well as disposal method/facility.</p> <p>Any complaints received regarding waste should be recorded with notes on action taken.</p> <p>All data to be compiled in a 6 month report.</p>	Proponent
Groundwater,	Leakages or spills from hazardous	The following measures must be employed to prevent	A report should be compiled	Proponent

Table 3.1: *Cont.*

Criteria	Nature	Mitigation	Monitoring	Responsible Body
		<p>when changing transformer oils.</p> <p>Due to the nature of some hazardous materials they should be disposed of in an appropriate way at an appropriately classified waste disposal facility. See the MSDS available from suppliers if the user is not sure how to dispose of the substance.</p>	<p>following information:</p> <p>date and duration of spill, product spilled, volume of spill, remedial action taken.</p>	
Visual Impact	This is an impact that affects the aesthetic appearance of the area.	Regular maintenance and general upkeep of the Park will ensure continuous low visual impact and maintain the general integrity of the solar Park.	A report should be compiled every 6 months of all maintenance and general upkeep done on the site.	Proponent
Ecosystem Impact	Illegal hunting and poaching of wild animals and Park material by workers onsite.	<p>All employees should be educated about the value of biodiversity.</p> <p>Strict conditions prohibiting harvesting and poaching of fauna and flora should be part of employment contracts.</p> <p>Disciplinary actions to be taken against all employees failing to comply with contractual conditions.</p>	<p>A register of all incidents must be maintained on a daily basis. This should include measures taken to ensure that such incidents do not repeat itself.</p> <p>All information and reporting to be included in a final report.</p>	Proponent
Birds roosting	Birds roosting, foraging and nesting on or around the solar panels.	<p>The nesting of birds should be discouraged. Changes to buildings should take into account the habitats that can be created inadvertently by certain architectural or engineering designs.</p> <p>All unnecessary destruction of nests should be avoided. Enforced anti-poaching measures. Disciplinary actions to be taken against all employees failing to comply with contractual conditions.</p> <p>Create awareness on the negative impacts of poaching and the importance of recording all incidents.</p>	<p>A register of all incidents must be maintained on a daily basis. This should include measures taken to ensure that such incidents do not repeat itself.</p> <p>A record should be kept of any extraordinary bird sightings or encounters on site.</p> <p>All data to be compiled in a 6 month report.</p>	Proponent
Collision of Birds on the	Collision of birds with power line.	Ensure the entire length of the power line is marked with large Double Loop Bird Flight Diverters to increase the	Collisions of birds with the power line should be	Proponent

Table 3.2: Decommissioning closure / upgrade stages mitigation measures.

Criteria	Nature	Mitigation	Monitoring	Responsible Body
Power Line Structures		visibility of the line. Marking should be on the top conductor at 10 – 15 meter intervals in alternating black and white devices.	recorded on a weekly basis and a quarterly report compiled on all incidents recorded. Additional mitigation measures must be investigated if collisions occur.	
Electrocution of Birds on the Power Line Structures	Electrocution of birds on power line structures.	Power line Poles <ul style="list-style-type: none"> • Each wire on the pole should be “gapped” (an air space safety gap) • Stay wire should all be “gapped” by insulators. • Offset jumpers where possible • T- Piece perch must be placed on top of the pole at each bend point and above the transformer structures. Power line Transformers <ul style="list-style-type: none"> • Ensure the design does not attract birds for perching etc. 	All incidents related to electrocution of birds with the power line poles or transformers should be recorded on a weekly basis and a quarterly report compiled on all incidents recorded. Additional mitigation measures must be investigated if collisions occur.	Proponent
Bird Nesting Activity on the Power Line Structures	Birds making nests on power line structures, solar panels or transformers.	No mitigation for bird nesting activity, but monitoring is essential.	All nesting events should be recorded on a weekly basis and a quarterly report compiled on all incidents recorded. Mitigation measures must be investigated if collisions occur.	Proponent
Cumulative Impact	Possible cumulative impacts associated with the operational phase include an increased impact of the surrounding environment, especially on bird populations, as a result of poaching or harvesting of Park products.	Addressing each of the individual impacts as discussed and recommended in the EMP would reduce the cumulative impact. Reviewing biannual and annual reports for any new or re- occurring impacts or problems would aid in identifying cumulative impacts and help in planning if the existing mitigations are insufficient.	Annual summary report based on all other impacts must be created to give an overall assessment of the impact of the Operational Phase.	Proponent
Community Liaison / Grievance Mechanism	grievances of surrounding community members regarding project implementation.	The Community Liaison Offices should implement the Community Communication plan which will include a register for public and community grievances. Communication regarding the project progress and maintenance should be provided to surrounding and local communities.	A grievance register should be kept as well as minute of all meeting which are held with community. All information and reporting to be included in a final report.	Proponent

Table 3.2: Cont.

Criteria	Nature	Mitigation	Monitoring	Responsible Body
Waste Production	<p>The ability of product to act as a waste which must be cleaned up.</p> <p>Upon decommissioning waste will be produced in the form of building rubble, obsolete equipment and structures, obsolete or residual products and equipment or structures that can be used elsewhere or sold as scrap.</p> <p>Soil polluted by hydrocarbons must be treated as hazardous waste.</p>	<p>Waste must be recycled and those items that cannot be used again must be scrapped in the appropriate manner.</p> <p>Upon demolition of the buildings and concrete the rubble must be removed from the property and taken to an approved dumpsite.</p>	<p>Regular visual inspection.</p> <p>A register of waste produced and disposal methods should be maintained.</p>	Proponent; Contractor
Ecology	<p>Operations spanning many years may create new habitat for fauna and flora. Upon decommissioning these habitats will be destroyed.</p>	<p>ALcon would have to ensure that no new habitat is created for flora and fauna. Before decommissioning the HSE would need to inspect every structural facility to ensure that the dismantling and removal of any structure would not affect any organism that has become dependent on those structures for survival, shelter or breeding.</p> <p>Where new habitats were created, that is now occupied by fauna or flora, Alcon must contact MET or other appropriate organizations to establish the conservation status of it.</p> <p>The possibility of relocating the fauna or flora must be investigated and executed. Should the species be listed as vulnerable to extinction, or worse, a meeting should be held with MET in order to determine the appropriate handling of the situation.</p> <p>After decommissioning the site must be restored to its natural condition if the site will not be used for similar future activities.</p>	<p>A report should be compiled of any fauna and flora that established itself on the premises. The report should include all actions taken to relocate or deal with the situation.</p> <p>A restoration plan must be prepared and funds assigned for this purpose during the operations of the Park.</p>	Proponent; Contractor; Restoration Ecologist
Employment	<p>Decommissioning of the solar Park may lead to retrenchments or re-location of staff no longer required.</p>	<p>Plan in advance for meeting the Labour Acts requirements for retrenching of staff if required.</p> <p>Where possible staff can be relocated to another photovoltaic Park that needs more staff.</p>	<p>During normal operations of the Park an annual report must be compiled that includes the appropriate plans for handling of employees should the Park</p>	Proponent; Directors & Public Relations personnel or Human Resource Department.

Table 3.2: *Cont.*

Criteria	Nature	Mitigation	Monitoring	Responsible Body
			be decommissioned. The report should include budgeting for retrenchments and possible alternative positions elsewhere.	
Dust	Dust will be generated during the Decommissioning Phase and might be aggravated during periods of strong winds.	It is recommended that regular dust suppression be included in the Decommissioning Phase, when dust becomes an issue. Personnel should be issued with dust masks for health and safety reasons.	Regular visual inspection. A complaints register must be maintained, in which any complaints from the community must be logged. Complaints must be investigated and, if appropriate, acted upon.	Proponent; Contractor
Noise	Noise pollution will exist due to heavy vehicles accessing the site to collect rubble from demolished building materials. Cranes may be erected for removing the huge storage tanks. Hammers, diggers and drills will be used.	Noise levels during this phase should follow the World Health Organization (WHO) guideline on maximum noise levels (Guidelines for Community Noise, 1999) to prevent hearing impairment. This limits noise levels in industrial areas to an average of 70 dB over a 24 hour period with maximum noise levels not exceeding 110 dB during the period. All personnel must be issued with hearing protectors and neighbours must be notified of the time and duration of decommissioning. Notice of the start of the decommissioning should be given to the local authorities with an invitation to give feedback at any time with regards the noise impact.	A complaints register must be maintained, in which any complaints from the community must be logged. Complaints must be investigated and, if appropriate, acted upon.	Proponent; Public Relations Personnel; Contractor.
Visual	This is an impact that affects the aesthetic appearance	Visual impact could pose one of the most significant impacts. Visual impacts could be limited through keeping all decommissioned areas clean and orderly at all times. Good housekeeping also reduces the risk of injuries. Notice of the start of the decommissioning should be given to the local authorities with an invitation to give feedback at any time with regards the visual impact.	A complaints register must be maintained, in which any complaints from the community must be logged. Complaints must be investigated and, if appropriate, acted upon.	Proponent; Contractor
Groundwater, Surface Water	Porous surface substrate can allow unwanted hazardous and ecologically	All precautions are to be taken to prevent contamination of the soil as this could enter the ecosystem. Leakages from	Report form for all spills or leaks is to be completed by	Proponent; Contractor

Table 3.2: *Cont.*

Criteria	Nature	Mitigation	Monitoring	Responsible Body
and Soil Contamination	detrimental substances to seep down to the water table.	vehicles might occur especially if they are serviced on site. Care must be taken to avoid contamination of soil and groundwater. Groundwater might spread pollutants to neighbouring receptors and may create an impact on underground utilities (i.e. fresh water supply to buildings, sewerage system). Pollutants in the soil and building rubble must be transported away from the site to an approved, appropriately classified waste disposal site. Confirm MSDS information for any remaining fuels, oils or lubricants that must be discarded.	Contractor and submitted to the HSE Team. A baseline study must be carried out after the decommissioning. This is to assess the condition of soil substrate and any groundwater present. Any pollution present must be addressed before the site can be signed over.	
Health, Safety and Security	During the Decommissioning Phase similar risks to human beings as with previous phases will be present. All other risks associated with demolitions must be considered.	There may be a possibility of someone getting injured when <ul style="list-style-type: none"> • Proper training of operators; • First aid treatment; • Medical assistance; • Emergency treatment; • Manuals and training regarding the correct handling of materials and packages should be in place and updated as new or updated MSDS' become available; • 24-hour security surveillance in case of opportunistic activities. 	A register of all incidents must be maintained on a daily basis. This should include measures taken to ensure that such incidents do not repeat it self.	Proponent; Contractor
Fire	Outbreak of an uncontrolled fire due to open fires made by workers onsite while decommissioning the Park.	The holistic fire protection and prevention plan should still be utilised. Experience has shown that the best chance to rapidly put out a major fire is in the first 5 minutes. It is important to recognise that a responsive fire prevention plan does not solely include the availability of fire fighting equipment, but more importantly, it involves premeditated measures and activities to timeously prevent, curb and avoid conditions that may result in fires.	A register of all incidents must be maintained on a daily basis. This should include measures taken to ensure that such incidents do not repeat it self.	Proponent; Contractor

3.4 EMP and Mitigation Guidance

3.4.1 Overview

The following is the summary of the general mitigation guidance covering preconstruction, construction, operational and decommissioning for the Aussenkehr 5MW Solar PV Park by ALCON Consulting Services (Pty) Ltd:

- ❖ General mitigation guidance;
- ❖ Natural environmental management guidance;
- ❖ Vehicle use and access guidance;
- ❖ Control of dust guidance;
- ❖ Health and safety guidance;
- ❖ Preventing pollution and dangerous working conditions guidance;
- ❖ Saving water guidance;
- ❖ Disposal of waste guidance;
- ❖ Religious, cultural, historical and archaeological objects guidance;
- ❖ Dealing with environmental complaints guidance.

3.4.2 General EMP and Mitigation Guidance

The following is the summary of the general mitigation guidance in terms of applicability, implementation and monitoring of the EMP:

(i) General mitigation guidance:

- ❖ The Environmental Rules apply to EVERYBODY. This includes all permanent, contract, or temporary workers as well as any other person who visits the solar park area. Any person who visits the solar park area will be required to adhere to the company Environmental Code of Conduct;
- ❖ The Site Manager will issue warnings and will discipline ANY PERSON who breaks anyone of the Environmental Rules and Procedures. Repeated and continued breaking of the Rules and Procedures will result in a disciplinary hearing and which may result in that person being asked to leave the site permanently;
- ❖ The ENVIRONMENT means the whole surroundings around us. The environment is made-up of the soil, water, air, Parks and animals; and those characteristics of the soil, water, air, Park and animal life that influence human health and wellbeing, and;
- ❖ If any member of the WORK FORCE does not understand, or does not know how to keep any of Environmental Rule or Procedure, that PERSON must seek advice from the ENVIRONMENTAL CONTROL OFFICER (ECO), SITE MANAGER or CONTRACTOR. The PERSON that does not understand must keep asking until she/he is able to keep to the all the Environmental Rules and Procedures.

(ii) Natural Environmental Management Guidance:

- ❖ Never feed, tease or play with, hunt, kill, destroy or set devices to trap any wild animal (including birds, reptiles and mammals), livestock or pets. Do not bring any wild animal or pet to the area;
- ❖ Do not pick any Park or take any animal out of the solar park area EVER. You will be prosecuted and asked to leave the project area;
- ❖ Never leave rubbish and food scraps or bones where it will attract animals, birds or insects. Rubbish must be thrown into the correct rubbish bins or bags provided;
- ❖ Protect the surface material by not driving over it unnecessarily;
- ❖ Do not drive over, build upon, or camp on any sensitive habitats for Parks and animals;
- ❖ Do not cut down any part of living trees / bushes for firewood, and;
- ❖ Do not destroy bird nest, dens, burrow pits, termite hills etc or any other natural objects in the area.

(iii) Vehicle Use and Access Guidance:

- ❖ Never drive any vehicle without a valid licence for that particular vehicle and do not drive any vehicle that appears not to be road-worthy;
- ❖ Never drive any vehicle when under the influence of alcohol or drugs;
- ❖ DO NOT make any new roads without permission. Stay within demarcated areas;
- ❖ Avoid U-Turns and large turning circles. 3-point turns are encouraged. Do not ever drive on rocky slopes or ephemeral rivers, stick to the existing roads;
- ❖ Stay on the road, do not make a second set of tracks and do not cut corners;
- ❖ DO NOT SPEED - keep to less than 60 km per hour on the tracks and site roads;
- ❖ No off-road driving is allowed;
- ❖ Vehicles may only drive on demarcated roads, and;
- ❖ Adhere to speed limits and drive with headlights switched on along any gravel road.

(iv) Control of Dust Guidance:

- ❖ Do not make new roads or clear any vegetation unless instructed to do so by your Contractor or the Environmental Control Officer / Site Manager, and;
- ❖ Try to disturb the surface of the natural landscape as little as possible.

(v) Health and Safety Guidance:

- ❖ Drink lots of water every day, but only from the fresh water supplies;
- ❖ Take the necessary precautions to avoid contracting the HIV/AIDS virus;
- ❖ Only enter or exit the solar park area at the demarcated gates / or road;
- ❖ Always keep the access area as you found them;

- ❖ Any damage to any existing infrastructure in the area must be report to the Environmental Control Officer / Project Manager who will then inform the owner of any damage with all the repairs done to the satisfaction of the owner or Environmental Control Officer;
- ❖ Never enter any area that is out of bounds, or demarcated as dangerous or wander off without informing or permission of team leader;
- ❖ Report to your Contractor or the Site Manager if you see a stranger or unauthorised person in the solar park area;
- ❖ Do not remove any vehicle, machinery, equipment or any other object from the solar park area /site without permission of your Contractor or the Site Manager;
- ❖ Wear protective clothing and equipment required and according to instructions from your Contractor or the Site Manager, and;
- ❖ Never enter or work in the solar park area when under the influence of alcohol or drugs.

(vi) Preventing Pollution and Dangerous Working Conditions Guidance:

- ❖ Never throw any hazardous substance such as fuel, oil, solvents, etc. into streams or onto the ground;
- ❖ Never allow any hazardous substance to soak into the soil;
- ❖ Immediately tell your Contractor or Environmental Control Officer / Site Manager when you spill, or notice any hazardous substance being spilled anywhere in the solar park area;
- ❖ Report to your Contractor or Environmental Control Officer / Site Manager when you notice any container, which may hold a hazardous substance, overflow, leak or drip;
- ❖ Immediately report to your Contractor or Environmental Control Officer / Site Manager when you notice overflowing problems or unhygienic conditions at the ablution facilities;
- ❖ Vehicles, equipment and machinery, containers and other surfaces shall be washed at areas designated by the Contractor or Environmental Control Officer/ Site Manager, and;
- ❖ If you are not sure how to transport, use, store or dispose any hazardous substance - ASK your Contractor or Environmental Control Officer / Site Manager for advice.

(vii) Saving Water Guidance:

- ❖ Always use as little water as possible. Reduce, reuse and re-cycle water where possible;
- ❖ Report any dripping or leaking taps and pipes to your Contractor or Environmental Control Officer or Site Manager, and;
- ❖ Never leave taps running. Close taps after you have finished using them.

(viii) Disposal of Waste Guidance:

- ❖ Learn to know the difference between the two main types of waste, namely:
 - General Waste; and
 - Hazardous Waste.
- ❖ Learn how to identify the containers, bins, drums or bags for the different types of wastes.

Never dispose of hazardous waste in the bins or skips intended for general waste or construction rubble;

- ❖ Never burn or bury any waste on the solar park area;
- ❖ Never overfill any waste container, drum, bin or bag. Inform your Contractor or the Environmental Control Officer / Site Manager if the containers, drums, bins or skips are nearly full;
- ❖ Never litter or throwaway any waste on the site, in the field or along any road. No illegal dumping, and;
- ❖ Littering is prohibited.

(ix) Religious, Cultural, Historical and Archaeological Objects Guidance:

- ❖ If you find any suspected religious, cultural, historical or archeologically object or site around the solar park area, you must immediately notify your Contractor or Environmental Control Officer / Site Manager, and;
- ❖ Never remove, destroy, interfere with or disturb any religious, cultural, historical or archaeological object or site around the solar park area.

(x) Dealing with Environmental Complaints Guidance:

- ❖ If you have any complaint about dangerous working conditions or potential pollution to the environment, immediately report this to your Contractor or the Environmental Control Officer / Site Manager, and;
- ❖ If any person complains to you about noise, lights, littering, pollution, or any other harmful or dangerous condition, immediately report this to your Contractor or the Environmental Control Officer / the Site Manager.

4. ROLES AND RESPONSIBILITIES

4.1 Introduction

This section contains the roles and responsibilities with respect to the Environmental Management Plan (EMP) for the operational and decommissioning closure / upgrade stages for the now operational Aussenkehr 5MW Solar PV Park by ALCON Consulting Services (Pty) Ltd. A generic organisation structure for ALCON Consulting Services (Pty) Ltd with respect to the roles and responsibilities for implementation of this EMP is shown in Fig. 4.1.

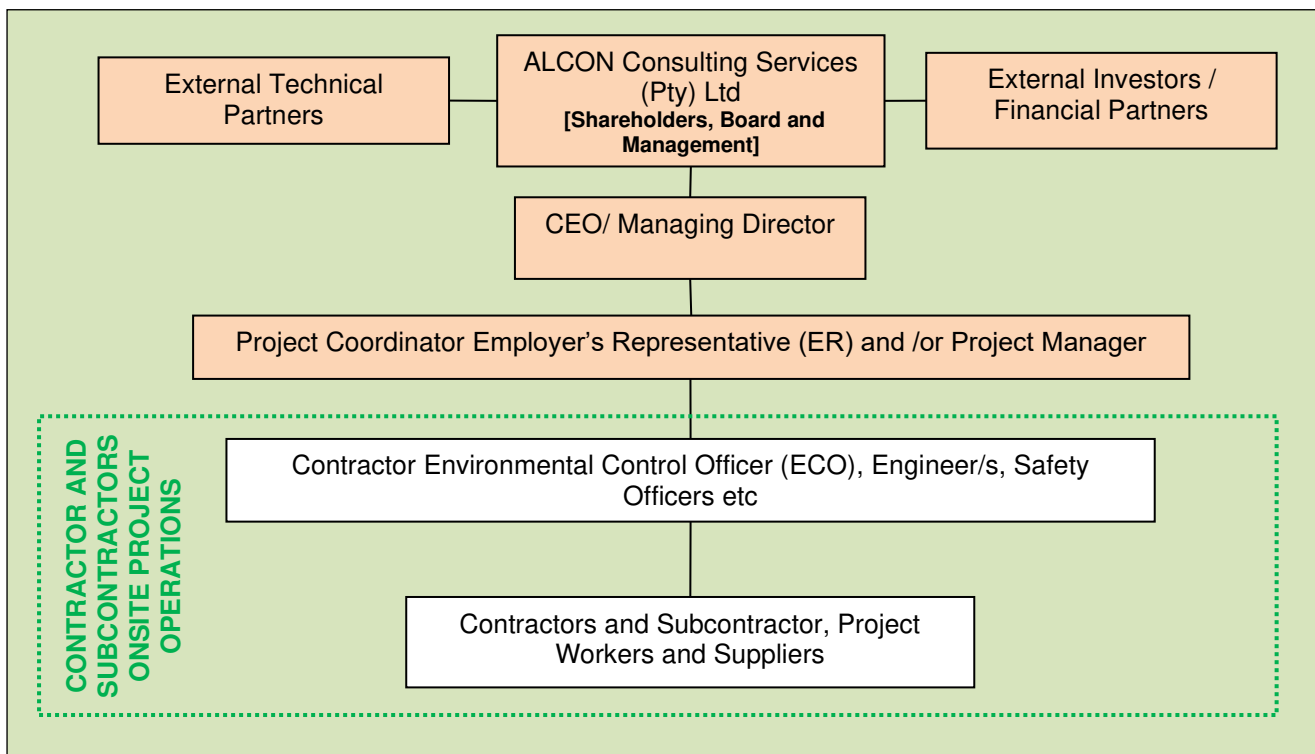


Figure 4.1: ALCON Consulting Services (Pty) Ltd organisational structure for the operational Aussenkehr 5MW Solar PV Park project with respect to this implementation of the EMP.

4.2 Roles and Responsibilities

4.2.1 Employer's Representative (ER) / Project Manager

ALCON Consulting Services (Pty) Ltd is to appoint an **Employer's Representative (ER)** with the following responsibilities:

- ❖ Act as the Employer's (ALCON Consulting Services (Pty) Ltd) on-site project manager and implementing agent;
- ❖ Appoint the Environmental Control Officer (ECO);
- ❖ Ensure that the Employer's responsibilities are executed in compliance with the relevant legislation and the EMP;
- ❖ Ensure that all the necessary environmental authorisations and permits have been obtained;
- ❖ Assist the Contractor in finding environmentally responsible solutions to challenges that may arise (with input from the ECO);

- ❖ Should the ER be of the opinion that a serious threat to, or impact on the environment may be caused by the construction operations, he/she may stop work; the Employer must be informed of the reasons for the stoppage as soon as possible;
- ❖ The ER has the authority to issue fines for transgressions of basic conduct rules and/or contravention of the EMP;
- ❖ Should the Contractor or his/her employees fail to show adequate consideration for the environmental aspects related to the EMP, the ER can have person(s) and/or equipment removed from the site or work suspended until the matter is remedied;
- ❖ Report to the Employer on the implementation of this EMP on site (with input from the ECO and/or independent environmental auditor);
- ❖ Maintain open and direct lines of communication between the Employer, ECO, Contractor and Interested and Affected Parties (I&APs) with regards to environmental matters, and;
- ❖ Attend regular site meetings and inspections.

4.2.2 Environmental Control Officer (ECO)

The **Environmental Control Officer (ECO)** has the following responsibilities:

- ❖ Assist the ER in ensuring that the necessary environmental authorisations and permits have been obtained;
- ❖ Assist the ER and Contractor in finding environmentally responsible solutions to challenges that may arise;
- ❖ Conduct environmental monitoring as per EMP requirements;
- ❖ Recommend on the issuing of fines for transgressions of basic conduct rules and/or contraventions of the EMP to the ER;
- ❖ Advise the ER on the removal of person(s) and/or equipment not complying with the specifications of the EMP;
- ❖ Carry out regular site inspections (on average once per week) of all construction areas with regards to compliance with the EMP; report any non-compliance(s) to the ER as soon as possible;
- ❖ Organise for an independent internal audit on the implementation of and compliance to the EMP to be carried out half way through the construction period; audit reports to be submitted to the ER;
- ❖ Organise for an independent post-construction environmental audit to be carried out;
- ❖ Continuously review the EMP and recommend additions and/or changes to the EMP document;
- ❖ Monitor the Contractor's environmental awareness training for all new personnel coming onto site;
- ❖ Keep records of all activities related to environmental control and monitoring; the latter to include a photographic record of the construction and environmental control and rehabilitation process, and a register of all major incidents; and

- ❖ Attend regular site meetings.

4.2.3 Contractor

The responsibilities of the **Contractor** include:

- ❖ Comply with the relevant legislation and municipal by-laws;
- ❖ Preparation and submission to ALCON Consulting Services (Pty) Ltd of the following Management Plans:
 - Environmental Awareness Training and Inductions;
 - Emergency Preparedness and Response;
 - Waste Management, and;
 - Health and Safety.
- ❖ Ensure adequate environmental awareness training for senior site personnel;
- ❖ Environmental awareness presentations (inductions) to be given to all site personnel prior to work commencement; the ECO is to provide the course content and the following topics, at least but not limited to, should be covered:
 - The importance of complying with the relevant Namibian, International and Best Practice Legislation;
 - Roles and Responsibilities, including emergency preparedness;
 - Basic Rules of Conduct (Do's and Don'ts);
 - EMP: aspects, impacts and mitigation;
 - Fines for Failure to Adhere to the EMP;
 - Health and Safety Requirements.
- ❖ Record keeping of all environmental awareness training and induction presentations, and;
- ❖ Attend regular site meetings and environmental inspection.

4.2.4 Construction Supporting Teams

The operation and decommissioning of the Aussenkehr 5MW Solar PV Park will require an array of specialist teams working very closely with their suppliers and core ALCON Consulting Services (Pty) Ltd onsite operations team. The following is a summary of some of the specialists that will be required especially during the decommissioning phase as part of the team of contractors:

- ❖ Solar panels Suppliers, installer, mechanical and crane contractors, electrical contractors and civil / structural contractors, each with their respective subcontractors and suppliers, would report directly to the Employer's Representative (ER), acting as the onsite Project Manager.

5. ENVIRONMENTAL PERFORMANCE MONITORING

5.1 Overview

The monitoring process of the EMP performances for the operational Aussenkehr 5MW Solar PV Park solar park project is divided into two parts and these are:

- (i) Monitoring activities and effects to be undertaken by the Environmental Control Officer (ECO), and;
- (ii) Preparation of an Environmental Monitoring Report covering all activities related to the Environmental Management Plan throughout the life cycle of the operational Aussenkehr 5MW Solar PV Park to be undertaken by the Environmental Control Officer (ECO).

5.2 Environmental Performance Monitoring Requirements

ALCON Consulting Services (Pty) Ltd will be required to report to the Ministry of Environment and Tourism the environmental performances for every six (6) months or as may be required / provided for in the conditions of the Environmental Clearance Certificate. The reporting process will form part of the ongoing environmental monitoring programme. Environmental monitoring programme is part of the EMP performances assessments and will need to be compiled and submitted as determined by the regulators. The process of undertaking appropriate monitoring as per specific topic and tracking performances against the objectives and documenting all environmental activities is part of internal and external auditing to be coordinated by the Environmental Control Officer (ECO) / External Consultant / Suitable qualified in-house resource person. Tables 5.1 – 5.9 outline the type of information that shall need to be recorded on a regular by the Environmental Control Officer (ECO) as part of the monitoring process of the activities and the effects.

The second part of the monitoring of the EMP performance will require a report outlining all the activities related to effectiveness of the EMP at the end of the solar park to be undertaken by the Environmental Control Officer (ECO). The types of the data sets to be used in the preparation of such a report are outlined in Tables 5.1 - 5.9.

The objective will be to ensure that corrective actions are reviewed and steps are taken to ensure compliance for future EIA and EMP implementation. The report shall outline the status of the environment and any likely environmental liability after completion of the now operational Aussenkehr 5MW Solar PV Park. The report shall be submitted to the Ministry of Environment and Tourism via the Ministry of Mines and Energy or Electricity Control Board and will represent the final closure and fulfilment of the Environmental Contract conditions to be signed between the Ministry of Environment and Tourism and the ALCON Consulting Services (Pty) Ltd.

Table 5.1: Monitoring of environmental performance implementation / environmental awareness training.

Mitigation	Compliance	Follow-up Action Required	By Whom	By When	Completed
Is there an Environmental awareness training programme?					
How many people have been given environmental awareness training?					
Is a copy of the EMP on site?					
How effective is the awareness training? Do people understand the contents of the EMP? Where are the weaknesses? Ask 3 people at random various questions about the EMP.					

Table 5.2: Monitoring of environmental performance for the temporal and permanent structures.

Mitigation	Compliance	Follow-up Action Required	By Whom	By When	Completed
Are the temporal and permanent structures positioned to avoid sensitive potential sensitive sites?					
Has new infrastructure been created? If so, what, and how well planned / built with respect to environment?					
Have toilets been provided? Where are they situated?					
Do receptacles for waste have scavenging animal proof lids?					
What litter is there – who is littering?					
Are there facilities for the disposal of oils / etc and how often is it removed to an approved disposal site?					
Is there evidence of oil / diesel spills? Bunding or not?					
What fuel source is being provided for cooking?					
Housekeeping					

Table 5.3: Environmental data collection.

Mitigation	Compliance	Follow-up Action Required	By Whom	By When	Completed
Are records being kept?					
Birds' mortality records as result of collision with the powerline?					
Birds nesting activities around the solar park and powerline area?					
Noise level?					
Air Quality?					
Have archaeological sites been found / disturbed / described?					
Other key environmental data sets?					

Table 5.4: Health and safety.

Mitigation	Compliance	Follow-up Action Required	By Whom	By When	Completed
Is there First Aid Kit containing anti-histamines etc?					
Are dangerous areas clearly marked off?					
Do vehicles appear to maintain the recommended speed limits?					
Do vehicles drive with headlights on along the gravel roads at all times?					

Table 5.5: Recruitment of labour.

Mitigation	Compliance	Follow-up Action Required	By Whom	By When	Completed
What labour source is used?					
How has the recruitment practice been done?					

Table 5.6: Management of the natural habitat and surficial materials management.

Mitigation	Compliance	Follow-up Action Required	By Whom	By When	Completed
Has there been any development done on or close sensitive areas?					
Has anyone been caught with Parks or animals in their possession?					
Has there been wilful or malicious damage to the environment?					
Has topsoil / seed bank layer been removed from demarcated development areas and appropriately stored?					

Table 5.7: Tracks and off-road driving.

Mitigation	Compliance	Follow-up Action Required	By Whom	By When	Completed
Are existing tracks used and maintained?					
What new tracks have been developed and are they planned?					
What evidence is there of off-road driving? Who appears to be responsible?					
Are corners being cut, what type of turning circle are there? Three point turns vs. U turns?					
Have unnecessary tracks been rehabilitated and how well?					
Comments					

Table 5.8: Management of surface and groundwater.

Mitigation	Compliance	Follow-up Action Required	By Whom	By When	Completed
How is potable water supplied and how often? Position of tanks?					
Is water being wasted?					
Is there any leakage from pipes or taps?					
Has casing been left when boreholes hit water and have any records of water strikes been kept? Were water samples taken and RWL measured?					

Table 5.9: Public relations.

Mitigation	Compliance	Follow-up Action Required	By Whom	By When	Completed
Have any complaints been made about the solar park construction and or operational activities by the different I&APs? If so, what, and how was the issue resolved?					

6. CONCLUSION AND RECOMMENDATIONS

6.1 Summary of Conclusions

Mitigation measures for both positive and negative impacts have been proposed and management strategies are provided in this updated Environmental Management Plan (EMP) covering the operational and decommissioning closure / upgrade stages.

This updated EMP incorporating all the constraints, relevant mitigation measures with respect to likely impacts and recommendations have been prepared for implementation by the Proponent. The EMP implementation and monitoring activities covers all the stages of the now operational Aussenkehr 5MW Solar PV Park project life cycle and is inclusive of the operation, decommissioning and closure / upgrade stages.

6.2 Recommendations

The following are the recommended actions to be implemented by the ALCON Consulting Services (Pty) Ltd as a part of the management of the impacts through implementations of the EMP covering the entire lifecycle (operational and decommissioning closure / upgrade stages) of the now operational Aussenkehr 5MW Solar PV Park:

- (i) The Proponent must at all time have valid permits (Environmental Clearance Certificate), licenses (Generation License) and consents (land and power evacuation) as may be applicable before implementation of the project (start with mobilisation and preconstruction);
- (ii) The Proponent shall implement and adopt precautionary approach by developing and implementing measures aimed at protection the physical, biological and socioeconomic receiving environments;
- (iii) The Proponent shall contract an Environmental Control Officer/ Consultant / suitable in-house resources person to lead and further develop, implement and promote environmental culture through awareness raising of the workforce, contractors and subcontractors;
- (iv) The Proponent / Environmental Control Officer/ Consultant / suitable in-house resources person shall work with the local experts in making sure that mitigation measures to minimise the impacts on receiving environment (physical, biological and socioeconomic environments) are fully implemented and monitoring measures are put place;
- (v) Before undertaking detailed site-specific such as the site decommissioning, the Proponent /Environmental Control Officer/ Consultant / suitable in-house resources person shall consider the sensitivity of the receiving environment;
- (vi) Burial of waste at any place other than an approved municipal waste disposal site is prohibited;
- (vii) The Proponent shall prepare a detailed decommissioning plan to be updated annually and providing for human and financial resources for decommissioning;
- (viii) The Proponent shall develop a simplified environmental induction and awareness programme for all the workforce, contractors and subcontractors and where contracted service providers are likely to cause negative environmental impacts, these will need to be identified and contract agreements need to be developed with costing provisions for environmental liabilities;
- (ix) The Proponent shall develop and implement a monitoring programme that will fit into the overall company's Environmental Policy and Management Systems (EMS), and;

- (x) The Proponent /Environmental Coordinator / Consultant / Suitable in-house resource person shall regularly (as may be required by the regulators) prepare and submitted to the regulators environmental monitoring reports.

All the responsibilities to ensure that the recommendations of this EMP Report are executed accordingly, rest with the **ALCON Consulting Services (Pty) Ltd**. The company must provide all appropriate resource required for the effective implementation of this EMP. It is the responsibility of **ALCON Consulting Services (Pty) Ltd** to make sure that all members of the workforce including contractors and subcontractors are aware of the provisions of this EMP Report and its objectives.

END



REPUBLIC OF NAMIBIA

MINISTRY OF ENVIRONMENT AND TOURISM

OFFICE OF THE ENVIRONMENTAL COMMISSIONER

ENVIRONMENTAL CLEARANCE CERTIFICATE

ISSUED

In accordance with Section 37(2) of the Environmental Management Act (Act No. 7 of 2007)

TO

**ALCON Consulting Services (Pty) Ltd
P. O. Box 27527, Windhoek, 2 Schutzen Street**

TO UNDERTAKE THE FOLLOWING LISTED ACTIVITY

**Operational Aussenkehr 5MW Solar PV Park, Karasburg District,
//Karas Region**



DEPUTY ENVIRONMENTAL COMMISSIONER

Issued on the date: 2019-12-19

Expires on this date: 2022-12-19

(See conditions printed over leaf)

Reduce

Reuse

Recycle



CONDITIONS OF APPROVAL

1. This environmental clearance is valid for a period of 3 (three) years, from the date of issue unless withdrawn by this office
2. This certificate does not in any way hold the Ministry of Environment and Tourism accountable for misleading information, nor any adverse effects that may arise from these activities. Instead, full accountability rests with the proponent and its consultants
3. This Ministry reserves the right to attach further legislative and regulatory conditions during the operational phase of the project
- 4.