

***Updated Environmental Management Plan for:  
the Proposed 5 MW Solar Photovoltaic Power  
Plant with 33 kV Powerline next to the  
NamPower Otjongava Substation at Oukongo–  
Okomize Village, Epupa Constituency, Kunene  
Region, Namibia.***

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## PROJECT DETAILS

<b>Title</b>	Updated Environmental Management Plan for the proposed establishment and operation of a 5 MW Solar Photovoltaic Power Plant with 33 kV Powerline next to the NamPower Otjongava Substation at Oukongo–Okomize Village, Epupa Constituency, Kunene Region, Namibia.		
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## Table of Contents

UPDATED ENVIRONMENTAL MANAGEMENT PLAN FOR THE PROPOSED OTJONGAVA ENERGY (PTY) LTD 5 MW SOLAR PV POWER PLANT. ....	2
1.1 Impact Assessment .....	2
1.2 Recommended Mitigation Measures for the Decommissioning Phase.....	8

## List of Tables

Table 1: The criteria used to determine the significance rating of the impact(s) .....	2
Table 2: Dust impact and mitigation.....	3
Table 3: Noise impact and mitigation .....	4
Table 4: Light reflection and visual impact and mitigation.....	4
Table 5: Health and safety and mitigation.....	5
Table 6: Solid and hazardous waste impact and mitigation .....	5
Table 7: Ecological and biodiversity impact and mitigation .....	6
Table 8: Socioeconomic impact and mitigation .....	7

# UPDATED ENVIRONMENTAL MANAGEMENT PLAN FOR THE PROPOSED OTJONGAVA ENERGY (PTY) LTD 5 MW SOLAR PV POWER PLANT.

## 1.1 Impact Assessment

To ensure uniformity in the evaluation of environmental impacts associated with activities of Otjongava Energy (Pty) Ltd, the rating criteria for the impact assessment have been standardised to include set definitions applied in the risk assessment (Table 1).

Table 1: The criteria used to determine the significance rating of the impact(s)

<b>Rating</b>	Definition of rating
<b>Status (+ or -)</b>	What causes the effect, what will be affected and how it will be affected
<i>Positive:</i>	Environment overall will benefit from the impact.
<i>Negative:</i>	Environment overall will be adversely affected by the impact.
<i>Neutral:</i>	Environment overall will not be affected
<b>Extent</b>	The area over which the impact will be experienced
	<b>1-Site specific:</b> Confined to the immediate vicinity of the project <b>2-Local:</b> Impact extends to the site and its surroundings limited to within 15 km of the project area <b>3-Regional:</b> Confined to the region <b>4-National:</b> limited to within the borders of Namibia <b>5-International:</b> Beyond the borders of Namibia
<b>Duration:</b>	The time frame for which the impact will be experienced
	<b>1-Very short</b> (Up to 2 years) <b>2-Short-term</b> (2 to 5 years) <b>3-Medium-term</b> (5 to 15 years) <b>4-Long-term</b> (> 15 years) <b>5-Permanent</b> (Generations)
<b>Intensity:</b>	The magnitude of the impact
	<b>1-No lasting effect</b> (No environmental functions and processes are affected) <b>2-Minor effects</b> (The environment functions, but in a modified manner) <b>3-Moderate effects</b> (Environmental functions and processes continue albeit in a modified way that does appear to have a noticeable disruptive effect) <b>4-High effects</b> (Environmental functions and processes are altered to such extent that they temporarily cease resulting in severe deterioration of the impacted environment) <b>5-Serious effects</b> (where environmental functions and processes are altered such that they permanently cease and/or exceed legal standards/requirements)
<b>Significance</b>	
	<b>Insignificant:</b> (A concern or potential impact that, upon evaluation, is found to have no significant impact at all.) <b>Minor:</b> (Any magnitude, impacts will be localised and temporary. Accordingly, the impact is not expected to require amendment to the project design.)

	<p><b>Moderate:</b>(Impacts of moderate magnitude locally to regionally in the short term. Accordingly, the impact is expected to require modification of the project design or alternative mitigation.)</p> <p><b>High:</b>(Impacts of high magnitude locally and in the long term and/or regionally and beyond. Accordingly, the impact could have a ‘no go zone’ implication for the project unless mitigation or re-design is practically achievable.) Mitigation</p>
<b>Confidence Level</b>	The degree of confidence in the predictions, based on the availability of information and specialist knowledge
	<p><b>Low:</b>(Assessment based on extrapolated data)</p> <p><b>Medium:</b>(Information base available but lacking)</p> <p><b>High:</b>(Information base comparatively reliable)</p>

Table 2: Dust impact and mitigation

<b>Dust Impact</b>	<b>Nature of the impact</b>	Prospecting work on site is likely to create very little dust. This may be an unwanted change to the community of the area.
	<b>Status</b>	Negative
	<b>Extent</b>	Site Specific and possibly local depending on mobility of particles and prevailing weather conditions.
	<b>Duration</b>	Short term
	<b>Intensity</b>	Minor
	<b>Prevention</b>	Dust creation cannot be completely prevented.
	<b>Significance</b>	<b>Minor.</b> Natural weather conditions can create very dusty atmospheric conditions. The small scale and site-specific activities contribute very little to the widespread conditions. Little or no additional atmospheric dust is expected from this activity.
	<b>Mitigation</b>	Dust suppression techniques should be employed if the specific activity is likely to create dusty atmospheric conditions more than the periodic extremes. Avoid activities that create excessive dust on extremely windy days. Personnel are required to wear personal protection equipment (PPE) such as dust masks if excessive dust is created for prolonged working periods. Using water to suppress drought is not an option since the country is experiencing a severe drought.
	<b>Confidence level</b>	High

Table 3: Noise impact and mitigation

<b>Noise Impact</b>	<b>Impact Description</b>	Potential noise sources could originate from vehicles, working machinery, installation of PV arrays and various project components. The nuisance factor of these noise sources will depend on the proximity of the activities to the nearby homesteads and the national road.
	<b>Status</b>	Negative
	<b>Extent</b>	Site Specific
	<b>Duration</b>	Short term
	<b>Intensity</b>	Minor during the construction phase
	<b>Prevention</b>	Noise creation cannot be completely prevented
	<b>Significance</b>	<b>Minor</b>
	<b>Mitigation</b>	The activities are to take place during normal working (daylight) hours only. It is recommended that any complaints regarding noise be recorded in the reports. There are industry standards to which the noise sources (i.e. machinery) must comply. Protective gear such as ear muffers should be provided to employees.
<b>Confidence level</b>	High	

Table 4: Light reflection and visual impact and mitigation

<b>Visual Impact</b>	<b>Nature of the Impact</b>	Temporary impact on the landscape and visual quality of the site would be created during the project activities. Given the height of the PV arrays not exceeding 3-4m and the low-lying of the PV Plant, the Project will be visible within the immediate vicinity and up to some kilometres around the Project site only, and thus is likely to create visual impacts.
	<b>Status</b>	Negative
	<b>Extent</b>	Local
	<b>Duration</b>	Long-term. Due to the created visual environment.
	<b>Intensity</b>	Moderate
	<b>Prevention</b>	Cannot be completely prevented
	<b>Significance</b>	Minor. No key sensitive visual receptors within the surrounding vicinity of the project site.
	<b>Mitigation</b>	Removal of all waste on a daily basis and dispose of it in the appropriate manner. Construction machinery, equipment and vehicles not currently in use should always be removed in a timely manner.
<b>Confidence level</b>	High	

Table 5: Health and safety and mitigation

<b>Health &amp; safety</b>	<b>Impact Description</b>	The potential impacts on human health and safety resulting from project activities could include occupational accidents and injuries, vehicle accidents, exposure to weather extremes, adverse health effects from dust generation and emissions, contact with hazardous materials and electrocution.
	<b>Status</b>	Negative
	<b>Extent</b>	Site specific
	<b>Duration</b>	Very short to long term
	<b>Intensity</b>	Minor to Serious Effects
	<b>Prevention</b>	Adequate measures must be brought in place to ensure health and safety of staff on site etc Personal Protective Equipment (PPE).
	<b>Significance</b>	Minor
	<b>Mitigation</b>	Procedures for dealing with injuries or accidents must be in place and all contact details for emergency personnel available. There should be a compulsory safety induction programme for all employees in place and rigorous awareness campaign to the community so that they avoid live wires or hard hat areas to avoid injury or death.
	<b>Confidence level</b>	High

Table 6: Solid and hazardous waste impact and mitigation

<b>Solid and Hazardous Waste Impact</b>	<b>Nature of the Impact</b>	Potential impacts from improper housekeeping practices during construction and operation (such as illegal disposal of waste to land) could contaminate and pollute soil which in turn could pollute groundwater resources. Solid (lumber, steel scrap, plastics, general rubbish, domestic waste etc) and Hazardous (used oil, paint cans etc.) waste will be generated during the construction and maintenance.
	<b>Status</b>	Negative
	<b>Extent</b>	Site specific
	<b>Duration</b>	Long term
	<b>Intensity</b>	Medium
	<b>Prevention</b>	Implementation of general best practice housekeeping measures
	<b>Significance</b>	Minor (waste will be controlled through the implementation of best practice housekeeping measures).
	<b>Mitigation Measures</b>	Develop a Solid Waste Management Plan Collection and disposal of solid waste should be done by a competent contractor to the approved landfill. Prohibit fly-dumping of any solid waste to the land. Prohibit illegal disposal of hazardous waste. Ensure that there are sufficient clearly labelled bins/containers in designated areas for wastewith sorting of recyclables, organics, and plastic wastes.



		Avoid or minimize the generation of waste materials, as far as practicable;
	<b>Confidence level</b>	High

Table 7: Ecological and biodiversity impact and mitigation

<b>Ecological and biodiversity Impact</b>	<b>Impact Description</b>	Site preparation activities which are to take place onsite by the Otjongava Energy (Pty) Ltd Contractor for installation of PV arrays and the various Project components which include land clearing activities, levelling, grading, etc. will cause direct and indirect disturbance to the flora and fauna within the site and the loss of the existing habitat.
	<b>Status</b>	Negative
	<b>Extent</b>	Local
	<b>Duration</b>	Long term (resulting in permanent change in the natural biodiversity on site)
	<b>Intensity</b>	Medium (Given that the change in the natural ecology will be noticeable)
	<b>Prevention</b>	None
	<b>Significance</b>	Moderate
	<b>Mitigation</b>	Avoid unnecessary clearing of vegetation. A fauna and flora survey were conducted to identify the presence of any key flora and fauna species of importance onsite and along the proposed transmission line route. A replacement programme should be undertaken by the proponent by plant indigenous trees at another suitable place. The lay down areas will be placed within the site boundary, not affecting adjacent land uses.
<b>Confidence level</b>	High	

Table 8: Socioeconomic impact and mitigation

<b>Socio-Economic Impact</b>	<b>Impact Description</b>	Impacts relating to the welfare, health and safety of the local communities may arise as a result of traffic, noise, air quality, pollution issues, etc. There is a soccer field close to the project site which will be relocated to another site and upgraded to a modern standard. During the construction phase Otjongava Energy (Pty) Ltd may at a minimal provide job opportunities to the local community. The leasing of land for the project has resulted in the availability of financial resources to the local community.
	<b>Status</b>	Positive
	<b>Extent</b>	Local
	<b>Duration</b>	Long term
	<b>Intensity</b>	Minor
	<b>Prevention</b>	None
	<b>Significance</b>	Minor
	<b>Mitigation</b>	<p>No strict mitigation measures have been identified. However it is critical that Otjongava Energy (Pty) Ltd should timely and continuously communicate and disseminate information with the local community to alleviate potential sense of social marginalisation, drive gender quality and enhance their understanding and perception of the benefits associated with the project as Otjongava Energy (Pty) Ltd plans to set up the Otjongava Energy Foundation that will be highly active in transformative social investments that empower the communities around them;</p> <ul style="list-style-type: none"> <li>• The foundation targets to set up the following projects as a means to develop community-based empowerment centered on operating assets proximity rather than shifting benefits from the community;</li> <li>• Education Fund: This fund will be eligible to the immediate community as a transformative plan to assist the immediate targeted community beneficiaries to access tertiary education in Namibia, Regionally or internationally through scholarships.</li> <li>• Community Business Stimulus Fund: Capital remains a challenge for entrepreneurs at grassroots level, especially the micro-entrepreneurs as a means of transformation the company will embark on offering grants to micro-entrepreneurs in individual capacity or group capacity to ensure development of community businesses.</li> <li>• Health Care Support: Health Care access remains a challenge in rural areas and Otjongava Energy (Pty) Ltd would like to ensure they develop health care infrastructure in the proximity of their operations, develop mobile clinic units as well as improve access to health care through running “Transit Doctors” fully funded by the company to travel around the communities offering health care and giving primary health care advice to the communities.</li> </ul>

		<ul style="list-style-type: none"> <li>• <b>Recreational Stimulation:</b> Otjongava will strategically support recreational activities through a sponsorship budget for identified sporting and cultural activities around the communities to nature and develop cultural and sports talent.</li> <li>• <b>Community Leadership Support (Non Political):</b> The business will strategically support the traditional authority on specific projects evaluated as beneficial to the community and have strategic transformational value of the society.</li> <li>• <b>Relief Funds:</b> The business will set aside funds for relief in the form of food, farming inputs, disaster relief, and drought assistance as a first community responder for such instances.</li> <li>• <b>Inclusive Support Fund:</b> Through the inclusive fund Otjongava can support the vulnerable of the vulnerable orphans, single parents, old aged, the visually impaired, and differently abled with challenges and mentally challenged members of the community by addressing their direct need to better their livelihoods either through financial support or livelihoods projects.</li> </ul> <p>The Foundation will be registered as a Section 23 Company that receives funding from Otjongava Energy Pty Ltd as an institutional donor annually as per the discretion of the board and other well-wishers that support the foundations causes and identified engagement areas.</p>
	<b>Confidence level</b>	High

## 1.2 Recommended Mitigation Measures for the Decommissioning Phase

Even though as stipulated by the environmental legislation of Namibia that a separate EIA be carried out prior to decommissioning, it is important to take heed of the following mitigation measures which are recommended from an ecological point of view as part of the decommissioning phase after 25 years.

- Rehabilitate all areas impacted on by the infrastructure.
- Remove all construction waste; rip temporary tracks, if feasible, and replace the topsoil.
- Re-introduce indigenous vegetation such as *Peltophorum africanum*, *Terminalia sericea*, *Ficus sycomorus subsp. gnaphalocarpa*, *Colophospermum mopane* and *Sclerocarya birrea* as part of the rehabilitation process.
- Re-introduce agricultural activities once the vegetation has been rehabilitated and established.

- Monitor and manage invasive alien plants as well as erosion of the site after activities are completed.