

Project Name:	ENVIRONMENTAL IMPACT ASSESSMENT AND ENVIRONMENTAL MANAGEMENT PLAN FOR THE RENEWAL OF THE ENVIRONMENTAL CLEARANCE FOR THE PROVISION OF MUNICIPAL SERVICES AT KATWITWI, KAVANGO WEST REGION
The Proponent:	The Chief Regional Officer Kavango West Region P O Box 6004 NKURENKURU
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Release Date:	February 2021
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# **EXECUTIVE SUMMARY**

Green Earth Environmental Consultants have been appointed by Denchi Consulting Engineers (on behalf of the Kavango West Regional Council – The Proponent) to attend to and complete an Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) to renew the Environmental Clearance (EC) for the construction and operation of municipal services at Katwitwi as per the requirements of the Environmental Management Act (No. 7 of 2007) and the Environmental Impact Assessment Regulations (GN 30 in GG 4878 of 6 February 2012).

An Environmental Clearance Certificate for the proposed activity was obtained on 11 September 2017. The implementation of the project was delayed due to the availability of funds. Funds have now been obtained and implementation will start soon. To be able to continue with the construction and operation of the service, the ECC must be renewed.

The land within the immediate vicinity of the proposed project site is predominately characterized by undisturbed natural environment and some residential activities. In terms of the Regulations of the Environmental Management Act (No 7 of 2007), an Environmental Impact Assessment has to be done to address the following 'Listed Activities':

#### ENERGY GENERATION, TRANSMISSION AND STORAGE ACTIVITIES

- 1. The construction of facilities for -
- (b) the transmission and supply of electricity.

# WASTE MANAGEMENT, TREATMENT, HANDLING AND DISPOSAL ACTIVITIES

- 2.1 The construction of facilities for waste sites, treatment of waste and disposal of waste.
- 2.2 Any activity entailing a scheduled process referred to in the Atmospheric Pollution Prevention Ordinance, 1976.
- 2.3 The import, processing, use and recycling, temporary storage, transit or export of waste.

#### WATER RESOURCE DEVELOPMENTS

8.6 Construction of industrial and domestic wastewater treatment plants and related pipeline systems.

#### **INFRASTRUCTURE**

- 10.1 The construction of-
- (a) oil, water, gas and petrochemical and other bulk supply pipelines
- (b) public roads
- 10.2 The route determination of roads and design of associated physical infrastructure where -
- (a) It is a public road
- (b) the road reserve is more than 30m wide, or
- (c) the road caters for more than one lane of traffic in both directions.

The key characteristics/environmental impacts of the proposed project are as follows:

POSITIVE IMPACTS	NEGATIVE IMPACTS
The sewer generated by the inhabitants and	Building and household waste will be
activities of the town will be treated efficiently	created during construction, dust and
which will improve the quality of life of the	noise associated with construction
inhabitants.	activities and the ponds will have a visual
	impact.
The implementation of the proposed water	Risk of surface and groundwater
treatment plant will bring the activity in line	pollution if system is not properly
with the guidelines of the Ministry of Water,	constructed and maintained.
Agriculture and Forestry (Code of Practice:	
Vol. 2, 2008).	
Employment will be created during	Vegetation will be destroyed during the
construction and operations and from the	construction and animals and birds will
added irrigation activities.	be disturbed by the activities of people
	and construction equipment.

The environmental impacts during the operational phase of the proposed project:

IMPACTS DURING OPERATIONAL PHASE			
Aspect	Impact Type	Significance	Significance
		of impacts	of impacts
		Unmitigated	Mitigated
Ecology Impacts	-VE	L	L
Dust & Air Quality	-VE	M	L
Groundwater Contamination	-VE	M	L
Waste Generation	-VE	M	L
Failure of Reticulation Pipeline	-VE	M	L
Fires and Explosions	-VE	M	L
Safety & Security	-VE	M	L

Impact Evaluation Criterion (DEAT 2006):

Criteria	Rating (Severity)	
Impact Type	+VE	Positive
	0	No Impact
	-VE	Negative
Significance of	L	Low (Little or no impact)
impacts	М	Medium (Manageable impacts)
	Н	High (Adverse impact)

Mitigation measures will be provided that can control the extent, intensity, and frequency of these named impacts in order not to have substantial negative effects or results.

The type of activities that will be carried out on the site does not negatively affect the amenity of the locality and the activities do not adversely affect the environmental quality of the area. None of the potential impacts identified are regarded as having a significant impact to the extent that the proposed project should not be allowed. However, the operational activities further on need to be controlled and monitored by the assigned managers and the Kavango West Regional Council and Denchi Consulting Engineers.

The Environmental Impact Assessment Renewal which follows upon this paragraph was conducted in accordance with the guidelines and stipulations of the Environmental Management Act (No 7 of 2007) meaning that all possible impacts have been considered and the details are presented in the report.

Based upon the conclusions and recommendations of the renewed Environmental Impact Assessment Report and Environmental Management Plan following this paragraph, the Environmental Commissioner of the Ministry of Environment, Forestry and Tourism is herewith requested to:

- 1. Accept the renewed Environmental Impact Assessment.
- 2. Approve the Environmental Management Plan.
- 3. Issue an Environmental Clearance Certificate Renewal for the construction and operation of municipal services at Katwitwi and for the following "listed activities":

# ENERGY GENERATION, TRANSMISSION AND STORAGE ACTIVITIES

- 1. The construction of facilities for -
- (b) the transmission and supply of electricity.

# WASTE MANAGEMENT, TREATMENT, HANDLING AND DISPOSAL ACTIVITIES

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# LIST OF ABBREVIATIONS

DCM Deputy Chief of Mission

EC Environmental Clearance

ECO Environment Control Officer

EIA Environmental Impact Assessment

EMP Environmental Management Plan

I&APs Interested and Affected Parties

MEFT Ministry of Environment, Forestry and Tourism

SQM Square Meters

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# 1. INTRODUCTION

**Green Earth Environmental Consultants** have been appointed by Denchi Consulting Engineers (on behalf of the Kavango West Regional Council – The Proponent) to renew the Environmental Clearance Certificate for the construction and operation of municipal services at Katwitwi as per the requirements of the Environmental Management Act (No. 7 of 2007) and the Environmental Impact Assessment Regulations (GN 30 in GG 4878 of 6 February 2012).

An Environmental Clearance Certificate for the proposed activity was obtained on 11 September 2017. The implementation of the project was delayed due to the availability of funds. Funds have now been obtained and implementation will start soon. To be able to continue with the construction and operation of the service, the ECC must be renewed.

The Environmental Management Act (No. 7 of 2007) and the Environmental Impact Assessment Regulations (GN 30 in GG 4878 of 6 February 2012) stipulates that an Environmental Impact Assessment (EIA) report and management plan is required as the following 'Listed Activities' are involved:

## ENERGY GENERATION, TRANSMISSION AND STORAGE ACTIVITIES

- 1. The construction of facilities for -
- (b) the transmission and supply of electricity.

# WASTE MANAGEMENT, TREATMENT, HANDLING AND DISPOSAL ACTIVITIES

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- (a) It is a public road
- (b) the road reserve is more than 30m wide, or
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The renewed Environmental Impact Assessment below contains information on the proposed project and the surrounding areas, the proposed operations and activities, the

applicable legislation to the study conducted, the methodology that was followed, the public consultation that was conducted, and the receiving environment's sensitivity, any potential ecological, environmental, and social impacts.

# 2. BACKGROUND INFORMATION ON PROJECT

# 2.1.LOCALITY OF SITE

The Kavango Regional Council intends to construct municipal services in Katwitwi. The Council appointed Denchi Consulting Engineers to oversee the planning, construction and implementation of the project. Katwitwi Village is situated approximately 37km north-west of the Regional Capital Nkurenkuru and approximately 40km north of the District Capital Mpungu at the national border between Namibia and Angola along the Kavango River in the Mpungu Constituency of the Kavango-West Region. See below the locality of the site:

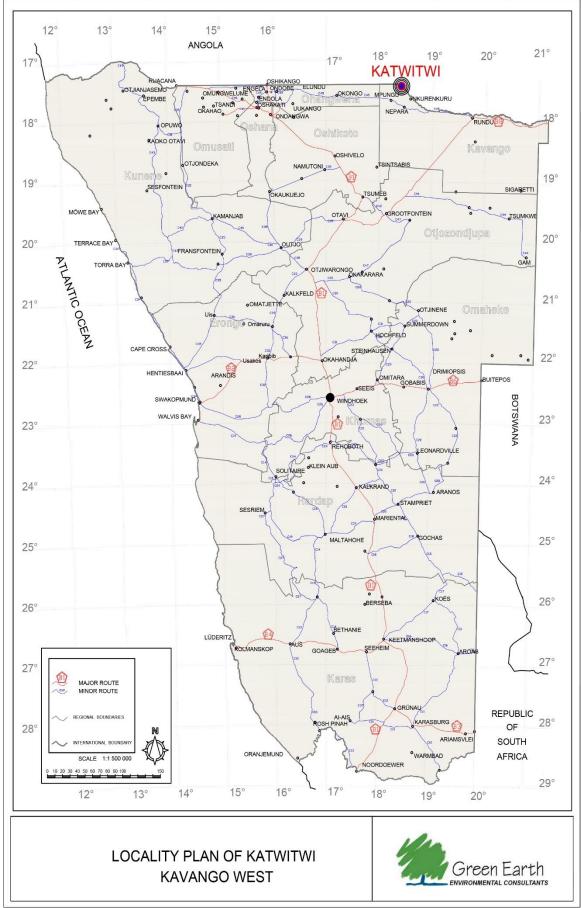


Figure 1: Locality of the Project Site

# 2.2. CURRENT SEWER FACILITIES OF THE VILLAGE

Katwitwi Village is currently operating without a formal sewer network which means that the residents must provide their own onsite solutions which is not ideal for the long term health of the community. Since the formalization of Katwitwi Village as official international border entry point for people traveling from Namibia to Angola or the other way around, the village grew in area and population. The Government established the necessary supporting infrastructure and facilities required to support the activities of an international border post. This created additional employment in the village as well as additional demand for housing facilities although formal municipal supporting services were not created to support the growth of the village. Continuing with the current onsite facilities is thus not the ideal situation.

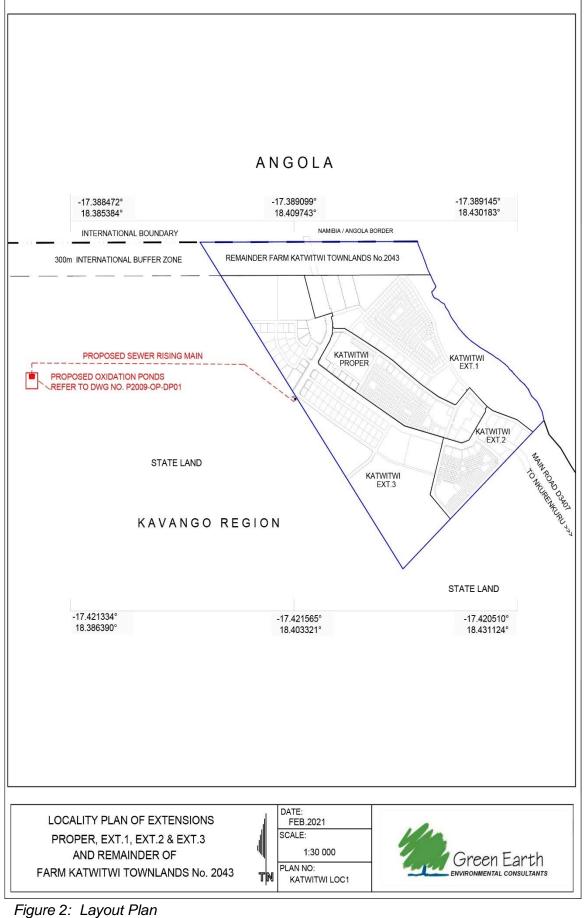
# 2.3. PROJECT DESCRIPTION/NATURE OF ACTIVITIES

It is the intention to provide municipal services for Katwitwi Village including a sewer reticulation network, rising main, water, access roads, electrical supply network, sewer pump station and oxidation ponds. The construction of the services will be phased for Katwitwi Proper and Katwitwi Extensions 1 to 3. It is proposed to locate the ponds approximately 4.0 km west of the village, outside the demarcated town lands boundary line.

The designed population considered for sizing the oxidation pond is approximately 9000 inhabitants at a future year 2035 with a current growth rate of approximately 3%. The expected capacity of the effluent plus organic is approximately 1200m³ per day. The expected organic load per day is approximately 450kg per day. The total estimated pond size for Katwitwi Village is 550m x 450m (approximately 25ha) which shall include:

- Two (2) anaerobic ponds
- One (1) primary pond
- Two (2) secondary ponds
- Four (4) maturity ponds

See the Layout Plan below:



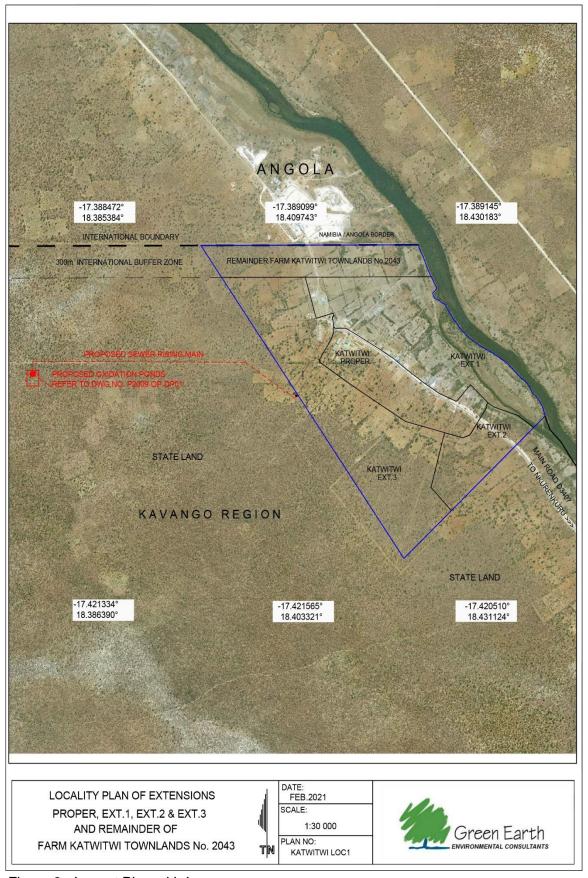


Figure 3: Layout Plan with Image

In considering the site, the most important considerations for selecting a suitable site include:

- Location: Ponds may not be built closer than 500m from the nearest residential area and where anaerobic ponds are included, this distance should ideally be increased to 1,0km.
- Topography: A gently sloping or flat area should be selected to ensure gravity flow from one pond to the next can be maintained. Under no circumstances should ponds be constructed in old riverbeds.
- Impenetrable underground: Ponds must be built on impermeable underground/soil and the embankments must also be constructed from a watertight material/soil. If no such soil is available, this should be supplied from a suitable source closest to the area. Clay or any similar material can be used for this purpose. For this pond it is proposed that it is lined with an impermeable liner.
- Ground water table: Areas with high water tables should be avoided groundwater pollution from seepage or overflows must always be regarded as a high possibility when ponds are employed.
- Wind: Excessive winds should be avoided to prevent mixing of the facultative ponds. Ponds should therefore be constructed with its longest dimension parallel to the prevailing wind direction.
- Population served: Pond systems may only be considered if the ultimate load does not exceed 5 000 PE (population equivalents) of 800 kl/d.
- No power lines: Care must be taken that no power lines, above or below ground, cross the area envisaged for the pond system.

Generally, pond systems are suitable where:

- Climatic conditions are favourable water temperatures should not drop below 15°C.
- Land is inexpensive.
- The ultimate load does not exceed 5 000 PE's (population equivalents) or 800kl/d.
- No skilled personnel are available.
- No electricity is available.

The proposed construction of municipal services for Katwitwi Village is in line with the above guidelines and conditions and thus supported from an Environmental perspective.

# 3. BULK SERVICES AND INFRASTRUCTURE PROVISION

The site is supported by the following services:

# 3.1.ACCESS ROAD

The project site where the oxidation ponds will be constructed will require a new road to link up with the internal street network which later link up with the main road leading through the village. This road has been discussed at the public meeting and will be constructed under the supervision of the consulting engineers.

# 3.2. WATER SUPPLY

The Katwitwi Settlement is supplied with water by NamWater. The erven to be linked to the new sewer system will be supplied with water through the water reticulation system of the settlement.

# 3.3. ELECTRICITY RETICULATION

Electricity will be supplied from the current NORED network to the pumps pumping the sewer to the pond.

# 3.4. SEWAGE DISPOSAL

The village currently houses no industries. Thus, only household sewer is generated in the Village which is currently stored into the individual septic tanks on the individual residential, government and business erven. The proposed sewer system will link up with these erven to collect the sewer from where it will be pumped via the rising main to the oxidation ponds.

# 3.5. SOLID WASTE DISPOSAL/REFUSE REMOVAL

The solid waste generated during construction must be contained in an enclosed area to prevent it from being blown away into the conservation area. The waste must be taken out of the area once construction is completed and be disposed of at an approved landfill site. Special care must be taken during the transportation of the waste out of the area.

The normal household waste generated during the construction and operation must be collected on site and sorted and temporally stored in an enclosed facility which prevents materials to be blown away, the access of flies as well as the visibility thereof. The system proposed is the Molok System of Rent-A-Drum. Molok Deep Collection System is an innovative waste management system that offers a clean, effective and efficient collection point for a variety of waste types and situations. More compact and hygienic than conventional methods and virtually odour free, the Molok Deep Collection system offers unrivalled advantages, particularly where space is limited. The key to the superior performance of the Molok Deep Collection system is the vertical, underground design. Only 40 per cent of the container is visible, while the remaining 60 percent is underground. This design means more storage capacity within less space, more compaction, fewer collections, fewer odours, and less litter. See images of Molok System below:



Figure 4: Molok Container

With this system the solid waste is sorted on site into glass, paper, plastic and metal which is put into separate bags provided by Rent-A-Drum and these bags are then individually closed and put into the Molok Container for collection and delivery to the nearest Rent-A-Drum Depot.

For this purpose the Proponent will sign an agreement with Rent-A-Drum who will supervise and manage the process for them. Through this process it will be assured that all the waste generated at the town/project site or through the other activities will be taken out of the conservation area.

# **3.6.FIRE PROTECTION**

The Proponent will put in the necessary fire protection equipment as per the requirements.

# 4. APPROVAL FROM MINISTRY OF ENVIRONMENT, FORESTRY AND TOURISM

The Ministry of Environment, Forestry and Tourism issued an Environmental Clearance Certificate on 11 September 2017 which expired on 11 September 2020. See below a copy of the ECC.





# MINISTRY OF ENVIRONMENT AND TOURISM

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11 September 2017

#### OFFICE OF THE ENVIRONMENTAL COMMISSIONER

Dr. Mpasi E. N. Katewa ne Chief Regional Officer Kavango West Region P. O. Box 6004 Nkurenkuru

Dear Dr Katewa

SUBJECT: ENVIRONMENTAL CLEARANCE CERTIFICATE FOR THE PROPOSED CONSTRUCTION AND OPERATION OF MUNICIPAL SERVICES INFRASTRUCTURE AT KATWITWI IN MPUNGU CONSTITUENCY, KAVANGO WEST REGION

The Environmental Scoping Report and Environmental Management Plan submitted are 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. In addition, the Environmental clearance certificate is issued with the condition that: all plicable and required permits are obtained and mitigations measures are applied particularly with respect to management of ecological impacts.

On the basis of the above, this letter serves as an environmental clearance certificate for the construction and operation of municipal services infrastructure (public roads, water and power supply lines, and exidation pond) at Katwitwii. 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 these activities. Instead, full accountability rests with the Kavango West Regional Office and its consultants.

This environmental clearance is valid for a period of 3 (three) years, effective 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

The purpose of this submission is to renew the Environmental Clearance for further three (3) years to allow the Proponent to continue with the implementation of the project.

# 5. TERMS OF REFERENCE

The Proponent (the Kavango West Regional Council) intends to apply for a renewed Environmental Clearance Certificate for the construction and operation of municipal services (oxidation ponds and sewer system reticulation infrastructure) for Katwitwi. To be able to implement the project, a renewed Environmental Impact Assessment is required. For the Environmental Impact Assessment, Green Earth Environmental Consultants followed the terms of reference as stipulated under the Environmental Management Act.

The aim of the environmental impact assessment is:

- To comply with Namibia's Environmental Management Act (2007) and its regulations (2012).
- To ascertain existing environmental conditions on the site to determine its environmental sensitivity.
- To inform I&APs and relevant authorities of the details of the proposed operations and to provide them with an opportunity to raise issues and concerns.
- To assess the significance of issues and concerns raised.
- To compile a report detailing all identified issues and possible impacts, stipulating the way forward and identify specialist investigations required.
- To outline management guidelines in an Environmental Management Plan (EMP) to minimize and/or mitigate potentially negative impacts.

The tasks that were undertaken for the Environmental Impact Assessment included the evaluation of the following: climate, water (hydrology), vegetation, geology, soils, social, cultural heritage, groundwater, sedimentation, erosion, biodiversity, sense of place, socioeconomic environment, health, safety and traffic.

The EIA and EMP from the assessment will be submitted to the Environmental Commissioner for consideration. Environmental Clearance will only be obtained (from the DEA) once the EIA and EMP has been examined and approved for the listed activity. The public consultation process as per the guidelines of the Act has been followed.

The methods that were used to assess the environmental issues and alternatives included a desk top study, the collection of data on the project site and area from the proponent and identified stakeholders. Consequences of impacts were determined in five categories: nature of project, expected duration of impact, geographical extent of the event, probability of occurring and the expected intensity.

All other permits, licenses or certificates that are further on required for the operation of the proposed project still needs to be applied for by the proponent.

# 6. APPROACH TO THE STUDY

The assessment included the following activities:

#### a) Desktop sensitivity assessment

Literature, legislation and guidance documents related to the natural environment and land use activities available on the site and area in general were reviewed to determine potential environmental issues and concerns.

#### b) Site assessment (site visit)

The proposed project site and the immediate surrounding areas were assessed through site visits to investigate the environmental parameters on site to enable further understanding of the potential impacts on site. A site visit involving the operator and contractor as well as representatives of the community took place on 27 April 2016.

# c) Public participation

The public were invited to give input, comments and opinions regarding the proposed project. Letters have been sent to Interested and Affected Parties (I&APs) and to relevant authorities. Notices were placed in two local newspapers (see Appendix) on two consecutive weeks (19 and 26 April 2016) inviting public participation and comments on the proposed project were requested. Notices were also displayed on site. A public meeting was held on 27 April 2016 at 9h00 in Katwitwi Village.

# d) Scoping

Based on the desk top study, site visits and public participation, the environmental impacts were determined in five categories: nature of project, expected duration of impact, geographical extent of the event, probability of occurring and the expected intensity. The findings of the scoping have been incorporated in the environmental impact assessment report below.

#### e) Environmental Management Plan (EMP)

To minimize the impact on the environment, mitigation measures have been identified to be implemented during planning, construction and implementation. These measures have been included in the Environmental Management Plan to guide the planning, construction and operation of the project which can also be used by the relevant authorities to ensure that the project is planned, developed and operated with the minimum impact on the environment.

## 7. ASSUMPTIONS AND LIMITATIONS

It is assumed that the information provided by the Proponent, Denchi Consulting Engineers and Interested and Affected Parties who attended the public meeting and other relevant parties are accurate. Various alternative sites were evaluated. The proposed project site was selected by the Proponent due to ease of accessibility and required size. The site was visited several times and any happenings after this are not mentioned in this report. (The assessment was based on the prevailing environmental conditions and not

on future happenings on the site.) However, it is assumed that there will be no significant changes to the proposed project, and the environment will not adversely be affected between the compilation of the assessment and the implementation of the proposed activities.

# 8. ADMINISTRATIVE, LEGAL AND POLICY REQUIREMENTS

To protect the environment and achieve sustainable development, all projects, plans, programs and policies deemed to have adverse impacts on the environment require an EIA according to Namibian legislation. The administrative, legal and policy requirements to be considered during the Environmental Assessment for the proposed project are the following:

- The Namibian Constitution
- The Environmental Management Act (No. 7 of 2007) and Regulations (2012)
- Other Laws, Acts, Regulations and Policies

#### THE NAMIBIAN CONSTITUTION

Article 95 of Namibia's constitution provides that: "The State shall actively promote and maintain the welfare of the people by adopting, inter alia, policies aimed at the following: Management of ecosystems, essential ecological processes and biological diversity of Namibia and utilization of living natural resources on a sustainable basis for the benefit of all Namibians, both present and future; in particular, the Government shall ensure that the natural resources and features like rivers, plants, trees as well as water resources are protected and sustained by providing measures against destroying the environment and the natural resources. This article recommends that a relatively high level of environmental protection is called for in respect of activities which might impact on these natural resources. Article 144 of the Namibian Constitution deals with environmental law and it states:

"Unless otherwise provided by this Constitution or Act of Parliament, the general rules of public international agreements binding upon Namibia under this Constitution shall form part of the law of Namibia". This article incorporates international law, if it conforms to the Constitution, automatically as "law of the land". These include international agreements, conventions, protocols, covenants, charters, statutes, acts, declarations, concords, exchanges of notes, agreed minutes, memoranda of understanding, and agreements (Ruppel & Ruppel-Schlichting, 2013). All ratified treaties and protocols are enforceable in Namibia by the Namibian Courts and these include the following:

- World Heritage Convention, 1972
- Vienna Convention for the Protection of the Ozone Layer, 1985
- Montreal Protocol on Substances that Deplete the Ozone Layer, 1987
- Convention on Biological Diversity
- Convention to Combat Desertification, 1994
- United Nations Framework Convention on Climate Change, 1998
- Kyoto Protocol on the Framework Convention on Climate Change, 1998

The Paris Agreement, 2016

It is therefore important that the international agreements and conventions are considered (see section 4.9).

#### **CONCLUSION AND IMPACT**

In considering the environmental rights, the Kavango West Regional Council and Denchi Consulting Engineers should consider the following in devising an action plan in response to these articles:

- Implement a "zero-harm" policy that would guide decisions.
- Ensure that no management practice or decision result in the degradation of future natural resources.
- Take a decision on how this part of the Constitution will be implemented as part
  of the Kavango West Regional Council's Environmental Control System (ECS).

# **ENVIRONMENTAL MANAGEMENT ACT (NO. 7 OF 2007) AND REGULATIONS (2012)**

The Environmental Impact Assessment Regulations (GN 30 in GG 4878 of 6 February 2012) of the Environmental Management Act (No. 7 of 2007) that came into effect in 2012 requires/recommends that an Environmental Impact Assessment and an Environmental Management Plan (EMP) be conducted for the following listed activities to obtain an Environmental Clearance Certificate:

#### ENERGY GENERATION, TRANSMISSION AND STORAGE ACTIVITIES

- 1. The construction of facilities for -
- (b) the transmission and supply of electricity.

# WASTE MANAGEMENT, TREATMENT, HANDLING AND DISPOSAL ACTIVITIES

- 2.1 The construction of facilities for waste sites, treatment of waste and disposal of waste.
- 2.2 Any activity entailing a scheduled process referred to in the Atmospheric Pollution Prevention Ordinance, 1976.
- 2.3 The import, processing, use and recycling, temporary storage, transit or export of waste.

## **WATER RESOURCE DEVELOPMENTS**

8.6 Construction of industrial and domestic wastewater treatment plants and related pipeline systems.

#### **INFRASTRUCTURE**

- 10.1 The construction of-
- (a) oil, water, gas and petrochemical and other bulk supply pipelines
- (b) public roads

- 10.2 The route determination of roads and design of associated physical infrastructure where -
- (a) It is a public road
- (b) the road reserve is more than 30m wide, or
- (c) the road caters for more than one lane of traffic in both directions.

Cumulative impacts associated with the project must be included as well as public consultation. The Act further requires all major industries and developers to prepare waste management plans and present these to the local authorities for approval.

The Act, Regulations, Procedures and Guidelines have integrated the following sustainability principles. They need to be given due consideration, particularly to achieve proper waste management and pollution control:

# **Cradle to Grave Responsibility**

This principle provides that those who handle or manufacture potentially harmful products must be liable for their safe production, use and disposal and that those who initiate potentially polluting activities must be liable for their commissioning, operation and decommissioning.

## **Precautionary Principle**

It provides that if there is any doubt about the effects of a potentially polluting activity, a cautious approach must be adopted.

# The Polluter Pays Principle

A person who generates waste or causes pollution must, in theory, pay the full costs of its treatment or of the harm, which it causes to the environment.

#### **Public Participation and Access to Information**

In the context of environmental management, citizens must have access to information and the right to participate in decisions making.

# **CONCLUSION AND IMPACT**

The proposed project has been assessed in terms of the Environmental Management Act (No. 7 of 2007) and the Regulations (2012). From the assessment, it can be concluded that the activities will have impacts on the prevailing environment but that the negative impacts can be sufficiently mitigated and managed by following the Environmental Management Plan which is part of this document.

Other Acts, Policies and guidelines will also be consulted to ensure that the project is constructed and operated in accordance with legislation and guidelines.

Table 1: Other laws, acts, regulations and policies

	Laws, Acts, Regulations & Policie	es consulted:
Electricity Act	In accordance with the Electricity	The Proponent must abide to
(No. 4 of 2007)	Act (No. 4 of 2007) which provides	the Electricity Act.
,	for the establishment of the	,
	Electricity Control Board and	
	provide for its powers and functions;	
	to provide for the requirements and	
	conditions for obtaining licenses for	
	the provision of electricity; to	
	provide for the powers and	
	obligations of licenses; and to	
	provide for incidental matters: the	
	necessary permits and licenses will	
	be obtained.	
Pollution	The Pollution Control and Waste	The Proponent must adhere to
Control and	Management Bill is currently in	the Pollution Control and
Waste	preparation and is therefore	Waste Management Bill.
Management	included as a guideline only. Of	ő
Bill (guideline	reference to the mining, Parts 2, 7	
only)	and 8 apply. Part 2 provides that	
•	no person shall discharge or cause	
	to be discharged, any pollutant to	
	the air from a process except	
	under and in accordance with the	
	provisions of an air pollution	
	license issued under section 23.	
	Part 2 also further provides for	
	procedures to be followed in	
	license application, fees to be paid	
	and required terms of conditions	
	for air pollution licenses. Part 7	
	states that any person who sells,	
	stores, transports, or uses any	
	hazardous substances or products	
	containing hazardous substances	
	shall notify the competent	
	authority, in accordance with sub-	
	section (2), of the presence and	
	quantity of those substances. The	
	competent authority for the	
	purposes of section 74 shall	
	maintain a register of substances	
	notified in accordance with that	
	section and the register shall be	
	maintained in accordance with the	
	provisions. Part 8 provides for	
	emergency preparedness by the	

	paran handling hazardaya	
	person handling hazardous	
	substances, through emergency	
	response plans.	
Water	The Water Resources	The Ministry of Agriculture,
Resources	Management Act (No. 11 of 2013)	Water and Land Reform must
Management	stipulates conditions that ensure	be consulted. Fresh water
Act	effluent that is produced to be of a	abstraction and waste-water
	certain standard. There should	discharge permits should be
	also be controls on the disposal of	obtained when required.
	sewage, the purification of effluent,	
	measures should be taken to	
	ensure the prevention of surface	
	and groundwater pollution and	
	water resources should be used in	
	a sustainable manner.	
Solid and	Provides for management and	The Proponent must abide to
Hazardous	handling of industrial, business,	the solid waste management
Waste	and domestic waste.	provisions.
Management	10000	
Regulations:		
Local		
Authorities		
1992		
Hazardous	The <b>Ordinance</b> applies to the	The Proponent must abide to
Substances	manufacture, sale, use, disposal	the Ordinance's provisions.
Ordinance	and dumping of hazardous	the Ordinance's provisions.
(No. 14 of		
•	substances, as well as their import	
1974)	and export and is administered by the Minister of Health and Social	
	Welfare. Its primary purpose is to	
	prevent hazardous substances	
	from causing injury, ill-health, or	
A	the death of human beings.	7
Atmospheric	Part 2 of the <b>Ordinance</b> governs	The proponent should adhere
Pollution	the control of noxious or offensive	to the stipulations of the
Prevention	gases. The Ordinance prohibits	Atmospheric Pollution
Ordinance of	anyone from carrying on a	Prevention Ordinance.
Namibia (No.	scheduled process without a	
11 of 1976)	registration certificate in a	
	controlled area. The registration	
	certificate must be issued if it can	
	be demonstrated that the best	
	escape into the atmosphere of	
	noxious or offensive gases	
	produced by the scheduled	
	process.	
	noxious or offensive gases produced by the scheduled	

Nature	The Nature Conservation	The proposed project
Conservation	Ordinance (No. 4 of 1975) covers	implementation is not located
Ordinance	game parks and nature reserves,	in a demarcated conservation
	the hunting and protection of wild	area, national park, or unique
	animals, problem animals, fish, and	environments.
	indigenous plant species. The	
	Ministry of Environment, Forestry	
	and Tourism (MEFT) administer it	
	and provides for the establishment	
	of the Nature Conservation Board.	
Forestry Act	The Forestry Act (No. 12 of 2001)	No removal of protected tree
, , , , , , , , , , , , , , , , , , , ,	specifies that there be a general	species or removal of mature
	protection of the receiving and	trees should happen. The
	surrounding environment. The	Ministry of Environment,
	protection of natural vegetation is	Forestry and Tourism should
	of great importance, the Forestry	be consulted when required.
	Act especially stipulates that no	be concaned when required.
	living tree, bush, shrub, or	
	indigenous plants within 100m from	
	any river, stream or watercourse,	
	may be removed without the	
	necessary license.	
EU Timber	Forest Stewardship Council (FSC)	The Proponent is advised to
Regulation:	came into effect in March 2013,	adhere to the regulation.
FSC (2013)	with the aim of preventing sales of	adnore to the regulation.
100 (2010)	illegal timber and timber products	
	in the EU market. Now, any actor	
	who places timber or timber	
	products on the market for the first	
	time must ensure that the timber	
	used has been legally harvested	
	and, where applicable, exported	
	legally from the country of harvest.	
Labour Act	The Labour Act (No. 11 of 2007)	The proponent and contractor
Labour 7101	contains regulations relating to the	should adhere to the Labour
	Health, Safety and Welfare of	Act.
	employees at work. These	7101.
	regulations are prescribed for	
	among others safety relating to	
	hazardous substances, exposure	
	limits and physical hazards.	
	Regulations relating to the Health	
	and Safety of Employees at Work	
	are promulgated in terms of the	
	Labour Act 6 of 1992 (GN156,	
	GG1617 of 1 August 1997).	
Communal	Communal land is land that	Consent should be obtained
Land Rights	belongs to the State and is held in	from the Traditional
Zana Mgmo	20.01190 to the otate and lo flold in	11011 tilo Traditional

	trust for the benefit of the	Authorities, Communal
	traditional communities living in	Boards, Chiefs, Kings,
	those areas. Communal land	Queens etc. involved.
	cannot be bought or sold, but one	
	can be given a customary land	
	right or right of leasehold to a part	
	of communal land in accordance	
	with the provisions of the	
	Communal Land Reform Act	
	(No. 5 of 2002) and Communal	
	Land Reform Amendment Act	
	(No. 13 of 2013). The Communal	
	Land Reform Act provide for the	
	allocation of rights in respect of	
	communal land to establish	
	Communal Land Boards to provide	
	for the powers of Chiefs and	
	Traditional Authorities and boards	
	in relation to communal land and to	
	make provision for incidental	
	matters. Consent and access to	
	land for the proposed project	
	should be requested from the	
	relevant traditional authority	
	through the Regional Council and	
	Regional Communal Land Boards.	
	Written request for consent shall	
	be send through the Office of	
	Governors for Kavango West and	
	East Regions.	
Public and	The Public and Environmental	The proponent and contractor
Environmental	Health Act (No. 1 of 2015) provides	should adhere to the Public
Health Act	with respect to matters of public	and Environmental Health Act.
	health in Namibia. The objects of	
	this Act are to: (a) promote public	
	health and wellbeing; (b) prevent	
	injuries, diseases, and disabilities;	
	(c) protect individuals and	
	communities from public health	
	risks; (d) encourage community	
	participation to create a healthy	
	environment; and (e) provide for	
	early detection of diseases and	
	public health risks.	
Coronavirus	The current global Coronavirus	The proponent, contractor and
(Covid-19)	(Covid-19) pandemic and the	workforce should adhere to
Pandemic	associated State of Emergency	the restrictions and
	and health restrictions globally may	regulations.

	result in some delays and logistic disruptions. The pandemic might have an impact on obtaining equipment, specialist workforce mobilisation and implementation of the project. The health restrictions may have an impact on campsite set-up, traveling of personal/workers and building of the infrastructure. The proponent, contractor and subcontractors should adhere to all the international, regional, and local Covid-19 health restrictions and protocols.	
National Heritage Act (No. 27 of 2004)	All protected heritage resources discovered need to be reported immediately to the National Heritage Council (NHC) and require a permit from the NHC before it may be relocated. This should be applied from the NHC.	The National Heritage Council should be consulted when required.
National Monuments Act of Namibia (No. 28 of 1969) as amended until 1979	No person shall destroy, damage, excavate, alter, remove from its original site or export from Namibia:  (a) any meteorite or fossil; or (b) any drawing or painting on stone or a petroglyph known or commonly believed to have been executed by any people who inhabited or visited Namibia before the year 1900 AD: or (c) any implement, ornament or structure known or commonly believed to have been used as a mace, used or erected by people referred to in paragraph (b); or (d) the anthropological or archaeological contents of graves, caves, rock shelters, middens, shell mounds or other sites used by such people; or (e) any other archaeological or paleontological finds, material or object; except under the authority of and in accordance with a permit issued under this section.	The proposed site for development is not within any known monument site both movable or immovable as specified in the Act, however in such an instance that any material or sites or archeologic importance are identified, it will be the responsibility of the developer to take the required route and notify the relevant commission.

Public Health	Under this act, in section 119: "No	The proponent will ensure that
Act (No. 36 of	person shall cause a nuisance or	all legal requirements of the
1919)	shall suffer to exist on any land or	project in relation to protection
	premises owned or occupied by him	of the health of their
	or of which he is in charge any	employees and surrounding
	nuisance or other condition liable to	residents is protected and will
	be injurious or dangerous to health."	be included in the EMP.
		Relevant protective equipment
		shall be provided for
		employees in construction.
		The development shall follow
		requirements and
		specifications in relation to
		water supply and sewerage
		handling and solid waste
		management so as not to
		threaten public health of future
		residents on this piece of land.
Soil	The objectives of this Act are to:	Only the area required for the
Conservation	Make provisions for the combating	operations should be cleared
Act (No. 76 of	and prevention of soil erosion;	from vegetation to ensure the
1969)	Promote the conservation,	minimum impact on the soil
1555,	protection and improvement of the	through clearance for
	soil, vegetation, sources, and	construction.
	resources of the Republic;	
Air Quality Act	The Air Quality Act (No. 39 of	The proponent and contractor
(N0. 39 of	2004) intends to provide for	should adhere to the Air
2004)	national norms and standards	Quality Act.
,	regulating air quality monitoring,	,
	management, and control by all	
	spheres of government; for specific	
	air quality measures; and for	
	matters incidental thereto.	
Traditional	The Traditional Authorities Act	Traditional Authorities should
Authorities	(No. 17 of 1995) provide for the	be consulted when required.
Act (No. 17 of	establishment of traditional	
1995)	authorities, the designation and	
	recognition of traditional leaders; to	
	define their functions, duties, and	
	powers; and to provide for matters	
	incidental thereto.	
Vision 2030	Namibia's overall development	The proposed project is an
and National	ambitions are articulated in the	important element in
Development	Nation's Vision 2030. At the	employment creation.
Plans	operational level, five-yearly	
	national development plans	
	(NDP's) are prepared in extensive	
	consultations led by the National	

Planning Commission in the Office of the President. Currently the Government has so far launched a 4th NDP which pursues three overarching goals for the Namibian nation: high and sustained economic growth; increased income equality; and employment creation.

# CONCLUSION AND IMPACT

Green Earth Environmental Consultants believe the above administrative, legal and policy requirements which specifically guide and govern the development at the proposed project site will be followed and complied with in the assessment of the activity.

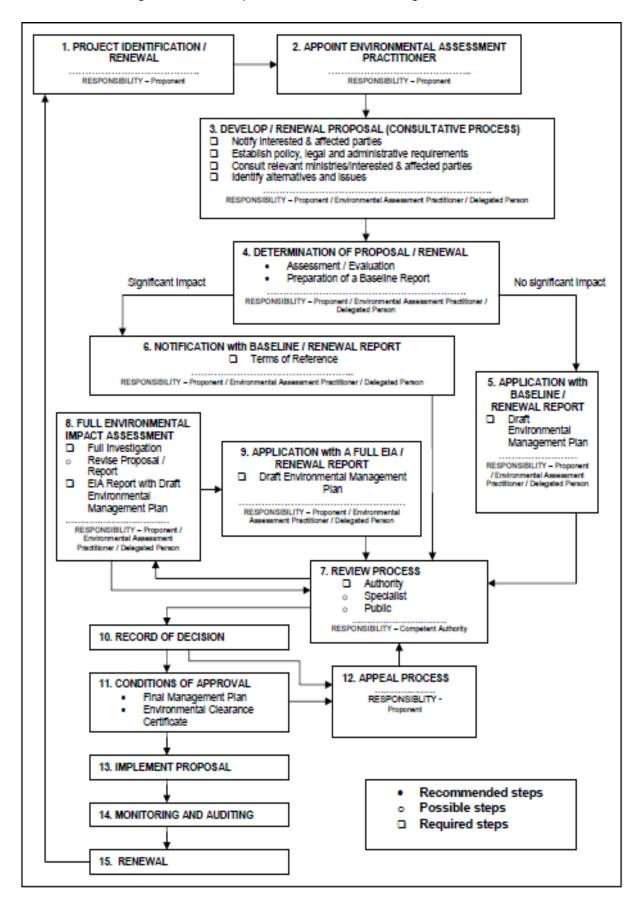


Figure 5: Flowchart of the Impact Process

# 9. AFFECTED RECEIVING ENVIRONMENT

# 9.1.BIODIVERSITY AND VEGETATION

Katwitwi Village form part of the Tree and Shrub Savanna Biome, specifically the Highland Savanna. A literature review was undertaken to determine the actual as well as the potential fauna and flora associated with the Tree and Scrub Savanna Biome of the site. This was followed up by a field study in April 2016 to determine the impact of the construction of the infrastructure on the bio-physical environment.

The project site is showing evidence of some human inference namely informal tracks are present and vegetation was cleared on some areas and a few gravel roads are present on the site.

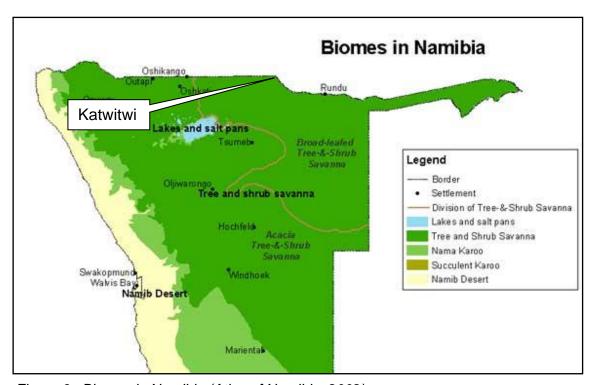


Figure 6: Biomes in Namibia (Atlas of Namibia, 2002)

The vegetation structure is classified as broadleaved woodlands with the North-Eastern Kalahari Woodland the dominated vegetation type (*Mendelsohn et al. 2002*). The general area is regarded as 'medium' in overall (all terrestrial species) diversity (*Mendelsohn et al. 2002*). Overall terrestrial endemism – all species - in the area on the other hand is 'low'.

The overall diversity and abundance of large herbivorous mammals is viewed as 'average' with oryx, kudu, elephant and giraffe dominant epecially in areas bordering the National Parks while the overall diversity and density of large carnivorous mammals (large preditors) is determined as 'average' with 1 – 5 species expected – e.g. leopard, brown hyena, spotted hyena, cheetah and wild dog (*Mendelsohn et al. 2002*)

The most important species from the general area are those classified as rare (*Nycteris hispida, Kerivoula argentata, Kervioula lanosa, Mastomys shortridgei, Civittictis civetta, Paracynictis selousi*) and endangerd (*Lycaon pictus, Lutra maculicollis, Equus (burchellii) quagga*) under Namibian legislation and those classifed by IUCN (2020) as endangered (*Lycaon pictus*), vulnarable (*Loxodonta africana, Smutsia (Manis) temminckii, Lycaon pictus, Acinonyx jubatis, Panthera pardus, Panthera leo, Hippopotamus amphibious, Giraffa cemelopardalis*) and near threatened (*Hipposideros vittatus*).

Loxodonta africana (the elephant), Giraffa cemelopardalis (the giraffe) and Lycaon pictus (the African wild dog) might be affected by the proposed activities as it might restrict their movement.

It is estimated that at least 67 species of reptile, 32 amphibian, 166 mammal and 210 bird species (breeding residents) are known or expected to occur in the Kavango East and West Regions of the project area.

The population of the most important amphibian species of the area, *Pyxicephalus adspersus* (the giant bullfrog) is decreasing as it is consumed as food by locals. Of the most important reptile species 2 are viewed as endemics (*Ichnotropis grandiceps and Lygodactylus bradfieldi*), 3 species are classified as rare (*Lycophidion multimaculatum, Psammophis jallae, Causis rhombeatus*) and 6 species are classified as vulnarable (*Stigmochelys pardalis, Psammobates oculiferus, Kinixys spekii, Phyton nantalensis, Varanus albigularis, Varanus niloticus*) in the area (*IUCN 2020*).

The most important bird species are those classified as endangered (hooded vulture, white-backed vulture, tawny eagle, martial eagle, bateleur, southern ground hornbill), the species cassified as vulnarable (secretary bird, white-headed vulture, lappet-faced vulture) and the species classified as near threathened (marabou stork, peregrine falcon, kori bastard) for Namibia (*Simmons et al. 2015*). The IUCN (2020) spesified the following species as critically endangered (hooded vulture, white-headed vulture, whoite backed vulture), as endangered (lappet-faced vulture), as vulnarable (secretary bird, tawny eagle, martial eagle, southern ground hornbill) and as near threathened (bateleur, kori bustard).

A large variety of deciduous trees are found in the Savannah and Woodlands (Northern Kalahari area) vegetation type. The grasses are usually hard and unpalatable in this area with *Anthephora pubenscens, Brachiaria nigropedata and Schmidtia pappophoroides* viewed as climax grasses in the open savannah areas (*Giess, 1971*)

The general area has a 'medium' plant diversity of between 300-399 species although the area along the Okavango River to the north has a higher diversity (400-499) species. The endemism is viewed as 'low' throughout with now species viewed as endemic (Mendelsohn et al. 2002)

The most important species expected to occur in the general area are *Baikiaea plurijuga* (Protected), *Burkea africana* (Protected), *Guibourtia coleosperma* (Protected) *Dalium engleranum*, (Protected) *Philenoptera violacea* (Protected) *Pterocarpus angolensis*, (Protected) *Schinziophyton rautanenii* (Protected) *Sclerocarya birrea* (Protected) and

various *Strychnos species* (Protected). Permits must be obtained if it is required to remove one of these protected species to align and construct the fence.

# **CONCLUSION AND IMPACT**

The natural characteristics of the project site namely the vegetation clearance and the destruction of habitats is expected to further on have a low impact on the environment before the mitigation measures are taken and after the mitigation measures are taken, the impact will be low.

# 9.2.CLIMATE

The climate of the study area is summarized in the table below:

Classification of climate	Semi-arid area
Average rainfall	Rainfall is averaged to be less than
	400mm - 450mm per year
Variation in rainfall	Variation is averaged to be 30 - 40% per
	year
Average evaporation	1960 - 2100mm per year
Precipitation	The highest rainfall is experienced in
	January/February
Water deficit	1500 - 1700mm per year
Temperatures	The average temperature is above 22°C
Wind direction	Predominantly easterly

The climatic conditions are favourable for a pond system – water temperatures should not drop below 15°C and the high average evaporation.

#### **CONCLUSION AND IMPACT**

The climate conditions are favourable for a pond system. Pond walls to be maintained in order to prevent erosion of the walls and breakage in the event of a thunder storm.

# 9.3. GEOLOGY, SOILS AND GROUNDWATER

The surface geology of the area consists of formations of the Kalahari Group which has a thickness of up to 30m in the study area. Within the Kalahari Group the following six lithological classifications are recognized: Duricrusts, Kalahari sand, Alluvium and lacustrine deposits, Sandstone, Marl, Basal conglomerate and gravel. See map below:

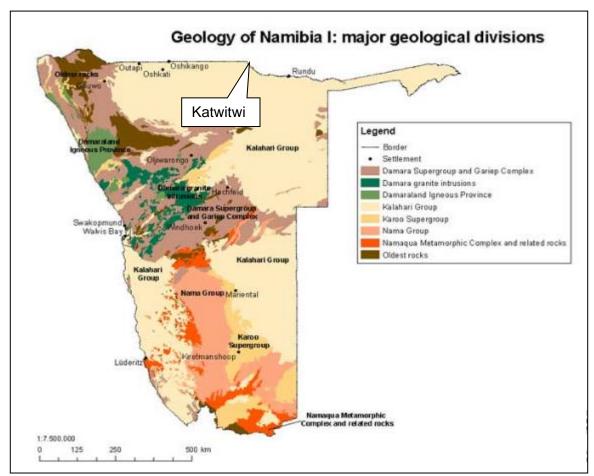


Figure 7: Geology of Namibia (Atlas of Namibia Project, 2002)

Surficial Kalahari sand covers almost the entire land surface. These lithologies comprise of fine to medium grained quartz sand, off-white in colour and typically clay-free in the upper 5m. These aeolian sands represent reworked Kalahari sediments. Though red sands occur, much of the surface sand in the study area is leached of any iron straining.

The transition from the so-called Kalahari sand to the older, underlying sandstone is often not clear, but seems to be gradational. Below the surficial horizon, similar sands are found, but often with varying clay content that may reach significant (>10%) proportions.

The Kalkrand Formation of the Karoo Supergroup is expected to underlie the Kalahari Group at Elim. Groundwater flow would be mostly through primary porosity but flow along fractures, faults and other geological structure present within the formations might take place where consolidated layers are present.

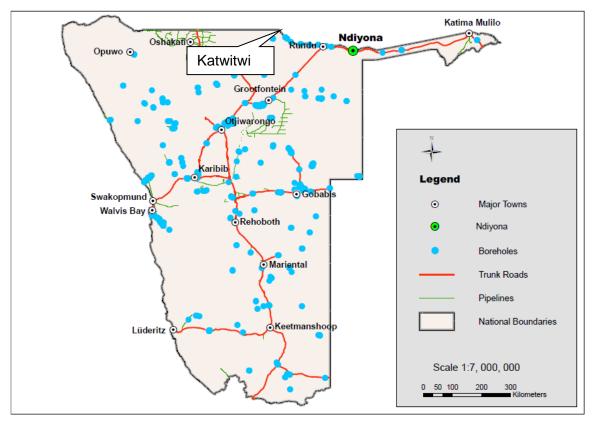


Figure 8: NamWater boreholes in Namibia

Ground water pollution can have a negative effect on the receiving environment as well as on the surrounding areas. Soil, geological and geo-hydrological characteristics of the site indicate that the potential significance that water resources will be damaged is very small if the proposed ponds are lined with an impermeable liner and the sewer line are properly installed and maintained. For ground water to be contaminated, large amounts of oil or fuel will have to seep through the soil over time. The Water Resource Management Act (No. 24 of 2004) stipulates that even the potential sources of pollution still require attention namely planning, controlling and managing the possible pollution of the receiving environment as the cumulative impact of many environmentally harmful incidents will in the long run have a detrimental impact on the downstream water sources, resources and users.

#### **CONCLUSION AND IMPACT**

The hydrogeology of the area prescribes that the sewer pipeline network, drains and ponds should be contained and lined with an impermeable liner to prevent any seepage of sewer into the groundwater which might eventually end up in the river or potable water extracted through boreholes in the study area and immediate surroundings.

With precautionary measures that are in place, groundwater contamination is easily prevented, and the proposed operations are not expected to have a detrimental impact on water resources in the area.

# 9.4.SURFACE WATER

Surface water flow in a catchment is largely determined by rainfall (quantity and intensity), potential evapotranspiration and catchment relief. A drainage system comprises all the elements of the landscape through which or over which water travels within that drainage basin. These elements include the soil, vegetation growing on it, geological materials underlying the soil, stream channels carrying surface water and the zones where water is held in the soil and moves below the surface. It also includes constructed elements such as pipes and culverts, cleared and compacted land surfaces, and pavement and other impervious surfaces unable to absorb water. The hydrology of a region is thus characterised by the collection, movement and storage of water through a drainage basin.

Alteration of a natural drainage basin through for instance urbanisation can impose dramatic changes in the movement and storage of water. These changes can have negative impacts on other parties that use water for industrial, domestic and livestock watering purposes in the immediate vicinity or downstream.

The major potential impacts of the proposed project on surface water primarily relates to the generation of increased run-off, water quality and possible pollution: Increased storm water and run-off due to vegetation removal during construction.

Erosion and sedimentation could result from soils that are being exposed during the clearing of land, grading and the installation of underground utilities namely water pipes or related infrastructure, etc. Erosion and sedimentation could further result in the degradation of habitats in the rainy season. Severe impacts may occur if erosion and sedimentation impacts are not taken into consideration namely loss of valuable topsoil, vegetation and habitat.

#### **CONCLUSION AND IMPACT**

Potential pollution can be due to storage, handling or spillage of hazardous substances and chemicals during the construction and transportation activities, and potential pollution due to sewage disposal due to leaking sewer pipes of broken pond walls or overflowing ponds. The infrastructure that will be constructed on the site is believed to have a limited impact on erosion and sedimentation since drainage channels will be kept open and will be incorporated in the operations. Pollution of surface water will be prevented if the infrastructure is properly constructed, maintained and managed.

# 9.5. SOCIAL-ECONOMIC COMPONENT

The socio-economic environment in and around Katwitwi has the following characteristics:

- Human assets are limited among communities in the northern parts of the country because of low education levels, widespread health risks and general food

insecurity (Kavango Zambezi Transfrontier Conservation Area Master Integrated Development Plan, 2015 – 2020).

- Financial assets are vested in livestock ownership, crop farming and the use of natural resources that are traded in informal markets.
- Livestock ownership and crop farming have declined in recent years because of disease and natural shocks.
- Tourism contributes little to household income.
- Traditional land use rights are the most common form of land ownership.
- People uses local material to build their houses.
- Physical infrastructure for electricity, water and sanitation, health and administrative services is low across the region (*Kavango Zambezi Transfrontier Conservation Area Master Integrated Development Plan, 2015 2020*).
- The land use in the area is mainly communal/subsistence farming comprising of cattle, donkeys, seasonal crop farming, grass and wood/timber harvesting.
- Subsistence seasonal crop farming are carried out on widely spaced communal villages especially in close proximity to river channels, plains and topographically low areas.
- The villages are mostly centered around communal water points or near schools or rural clinics where water is available.

It is envisaged that the development will create work for people during planning and construction and when in operation. Full time employment opportunities will be created for cleaners and gardeners and other related work. The development will give the area a much-needed economic injection which will have a multiplier effect in the community regarding services. The development may also bring in investments and buying power.

Most of the land use around the project site is characterised by open land, business and retail facilities, farming and agricultural related activities, the development will not have a negative impact on the neighbours or the surrounding areas. The development will be built with little disturbance to the environment and towards the individuals that are in the area. People residing in the area will benefit from employment created during planning, construction, and operation.



Figure 9: Neighbouring Land (1)



Figure 10: Neighbouring Land (2)



Figure 11: Neighbouring Land (3)

#### **CONCLUSION AND IMPACT**

It is believed that the development will have a positive socio-economic impact.

# 9.6. CULTURAL HERITAGE

The proposed project area is not known to have any historical significance prior to or after Independence in 1990. The specific area does not have any National Monuments and the specific site has no record of any cultural or historical importance or on-site resemblance of any nature. No graveyard or related article was found in the area. However, the Namibian National Heritage Act (No. 27 of 2004) provides for the protection and conservation of places and objects of heritage significance and the registration of such places and objects and to provide for incidental matters.

Under the National Heritage Act, conservation includes the following:

- The retention of the heritage significance of a place or object.
- The protection, maintenance, preservation, restoration, reconstruction or sustainable use of a place or object.

And under the National Heritage Act, heritage significance means:

- Aesthetic, archaeological, architectural, cultural, historical, scientific or social significance.

The Act also states that certain activities are prohibited namely a person may not remove or demolish, damage or despoil, develop or alter and excavate or export all or any part of a protected place (heritage place). A person may not relocate or disturb the position of a fixed object except if the Council issue a permit for such activity.

A person may apply to the Council for a permit to carry out works or activities in relation to a protected place or protected object. If the applicant is not the owner of the place or object, the consent of the owner is required. The activities should be carried out under the supervision of a person with appropriate professional qualifications or experience.

The term "heritage resource" is defined as places and objects of "cultural significance", which is defined as "aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance" (Winter & Baumann, 2005).

Heritage specialist input is required for the following reasons:

- To identify heritage resources which might be affected
- To assess the significance of the resources
- To determine constraints to guide the development
- To evaluate the negative and positive impacts of the project
- To make recommendations for the management of these impacts

The types of heritage resources may include the following:

- Places, buildings, structures and equipment of cultural significance
- Places where traditions are associated with living heritage
- Historical settlements or townlands
- Landscapes and natural features of cultural significance
- Geological sites of scientific or cultural importance
- Archaeological sites
- Graves and burial ground
- Sites related to historical slavery (Winter & Baumann, 2005)

Heritage values may include intangible elements including ceremonies, rituals, feelings, sights and sounds. No construction or development associated with the proposed project took place before the site visit.

The following conditions were obtained from the National Heritage Council of Namibia:

- That any archaeological or paleontological object or meteorite found in the course of the activity must be recorded, conserved and dealt with as per the manual on chance find procedures of heritage resources.
- That Namibian citizens, especially members of the local community in and around the project area, be engaged in the activity for the purpose of identification of heritage resources in the project area.

#### CONCLUSION AND IMPACT

No implications or expected impacts.

# 9.7. SENSE OF PLACE

The proposed project will not have a large/negative impact on the sense of place in the area. An untidy or poorly managed site can detract from the ecological well-being and individuality of the area. Unnecessary disturbance to the surroundings could be caused by poorly planned or poorly managed operational activities. The site should be kept neat and clean where possible. Vegetation should not be removed or harmed if not necessary since it covers topsoil which prevents erosion. Noise and dust should be limited in the operational phase.

#### **CONCLUSION AND IMPACT**

If the construction site is poorly managed or the sewer infrastructure is not properly maintained, it will have a negative impact on the sense of place.

# 9.8. HEALTH

The safety, security, and health of the labour force, employees and neighbours are of great importance, workers should be orientated with the maintenance of safety and health procedures and the workers should be provided with PPE (Proper Protective Equipment). A health and safety officer should be employed to manage, coordinate, and monitor risk and hazard and report all health and safety related issues in the workplace. The introduction of external workers into the area is sometimes accompanied with criminal activities posing security risks for neighbours. However, the proponent will take certain measures to prevent any activity of this sort. The welfare and quality of life of the neighbours and workforce needs to be considered for the project to be a success on its environmental performance. Conversely, the process should not affect the overall health of persons related to the project including the neighbours.

#### **CONCLUSION AND IMPACT**

If the proposed sewer system and ponds are properly constructed and maintained, it will be beneficial to the people residing in the town and area. If not, it can be a source of serious illnesses.

# 9.9.ROAD INFRASTRUCTURE

Development is usually associated with an increase in vehicles to and from the site since worker busses, delivery vehicles and trucks are needed for construction and operations. It is important that all vehicle drivers be informed of their potential impact on the environment and on the roads, and that the necessary measures should be taken to prevent any accidents because of increased traffic.

#### **CONCLUSION AND IMPACT**

Expected impacts are limited to the construction period.

# 10. ASSESSMENT AND EVALUATION

Development, no matter the type or scale, within an un-spoilt or even altered natural environment, is bound to have an impact or further impacts on the environment. This assessment concentrates on both the positive and negative impacts of the proposed project. The following assessment methodology will be used to examine each impact identified, see *Table* below:

Table 2: Impact Evaluation Criterion (DEAT 2006)

Criteria	Rating (Severity)					
Impact Type	+VE	Positive				
	0	No Impact				
	-VE	Negative				
Significance of impact being	L	Low (Little or no impact)				
either	М	Medium (Manageable impacts)				
	н	High (Adverse impact)				

Probability:	Duration:
5 – Definite/don't know	5 - Permanent
4 – Highly probable	4 - Long-term (impact ceases)
3 - Medium probability	3 – Medium term (5 – 15 years)
2 – Low probability	2 – Short-term (0 – 5 years)

1 – Improbable	1 - Immediate
0 - None	
Scale:	Magnitude:
5 – International	10 – Very high/don't know
4 - National	8 - High
3 – Regional	6 - Moderate
2 – Local	4 - Low
1 – Site only	2 - Minor
	0 - None

The impacts identified during the environmental assessment are those impacts that might happen during the preconstruction and construction activities, the impacts during the operations and the impacts associated with the decommissioning.

# 10.1.IMPACTS DURING CONSTRUCTION

Some of the impacts that the project will have on the environment includes water will be used for the construction and operational activities, electricity will be used, and wastewater will be produced on the site that will have to be handled.

# **10.1.1. WATER USAGE**

Water is a scarce resource in Namibia and therefore water usage should be monitored and limited in order to prevent unnecessary wastage. The proposed operations will make use of water in the construction phase and limited in the operational phase.

# Impact Evaluation

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significa	ance
						Unmitigated	Mitigated
Ecology	-VE	2	3	4	3	M	L

# 10.1.2. ECOLOGICAL IMPACTS

The proposed project will be situated in a semi disturbed natural area which is sparsely covered with vegetation. Special care should be taken to limit the destruction or damage of the vegetation. However, impacts on fauna and flora are expected to be minimal. Disturbance of areas outside the designated working zone is not allowed.

#### Impact Evaluation

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Signific	ance
	,,,,					Unmitigated	Mitigated
Ecology	-VE	1	2	4	2	L	L

# 10.1.3. DUST POLLUTION AND AIR QUALITY

Dust generated during the transportation of building materials; construction and installation of bulk services, and problems thereof are expected to be low and site specific due to the nature of the top soils. Dust is expected to be worse during the winter months when strong winds occur. Release of various particulates from the site during the construction phase and exhaust fumes from vehicles and machinery related to the construction of bulk services are also expected to take place. Dust is regarded as a nuisance as it reduces visibility, affects the human health and retards plant growth.

Construction is commonly of a temporary nature with a definite beginning and end. Construction usually consists of a series of different operations, each with its own duration and potential for dust generation. Dust emission will vary from day to day depending on the phase of construction, the level of activity, and the prevailing meteorological conditions. Dust will be generated significantly due to the dry conditions and the sandy texture of the soils in the project area.

Impact evaluation

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Signific	ance
	,,,					Unmitigated	Mitigated
Dust & Air Quality	-VE	2	2	2	2	М	L

# 10.1.4. NOISE IMPACT

An increase of ambient noise levels at the proposed site is expected due to the construction activities. Noise pollution due to heavy-duty equipment and machinery might be generated.

It is not expected that the noise generated during construction will impact any third parties due to the distance of the neighbouring activities. Ensure all mufflers on vehicles are in full operational order; and any audio equipment should not be played at levels considered intrusive by others. The construction workers should be equipped with ear protection equipment.

#### Impact evaluation

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significa	ance
	1,7,0					Unmitigated	Mitigated
Noise	-VE	2	1	4	2	М	L

# 10.1.5. HEALTH, SAFETY AND SECURITY

The safety, security and health of the labour force, employees and general public are of great importance. Workers should be orientated with the maintenance of safety and health procedures and they should be provided with PPE (Proper Protective Equipment). A health and safety officer should be employed to manage, coordinate and monitor risk and hazard and report all health and safety related issues in the work place.

Safety issues could arise from the earthmoving equipment and tools that will be used on site during the construction phase. This increases the possibility of injuries and the contractor must ensure that all staff members are made aware of the potential risks of injuries on site. The presence of equipment lying around on site may also encourage criminal activities (theft).

Sensitize operators of earthmoving equipment and tools to switch off engines of vehicles or machinery not being used. The contractor is advised to ensure that the team is equipped with first aid kits and that they are available on site, always. Workers should be equipped with adequate personal protective gear and properly trained in first aid and safety awareness.

No open flames, smoking or any potential sources of ignition should be allowed at the project location. Signs such as 'NO SMOKING' must be prominently displayed in parts where inflammable materials are stored on the premises. Proper barricading and/or fencing around the site especially trenches for pipes and drains should be erected to avoid entrance of animals and/or unauthorized persons. Safety regulatory signs should be placed at strategic locations to ensure awareness. Adequate lighting within and around the construction locations should be erected, when visibility becomes an issue.

#### Impact evaluation

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
	,,					Unmitigated	Mitigated
Safety & Security	-VE	1	2	4	2	М	L

# 10.1.6. CONTAMINATION OF GROUNDWATER

Care must be taken to avoid contamination of soil and groundwater. Use drip trays when doing maintenance on machinery. Maintenance should be done on dedicated areas with linings or concrete flooring. The risk can be lowered further through proper training of staff. All spills must be cleaned up immediately. Excavations should be backfilled and sealed with appropriate material, if it is not to be used further.

#### Impact Evaluation

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significa	ance
	,,,					Unmitigated	Mitigated
Ground- water	-VE	2	2	2	2	М	L

# 10.1.7. SEDIMENTATION AND EROSION

Vegetation stabilizes the area against wind erosion. Vegetation clearance and creation of impermeable surfaces could result in erosion in areas across the proposed area. The clearance of vegetation will further reduce the capacity of the land surface to slow down the flow of surface water, thus decreasing infiltration, and increasing both the quantity and velocity of surface water runoff. The proposed construction activities will increase the number of impermeable surfaces and therefore decrease the amount of groundwater infiltration. As a result, the amount of storm water during rainfall events could increase. If proper storm water management measures are not implemented this will impact negatively on the water courses close to the site.

# Impact Evaluation

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
	,,					Unmitigated	Mitigated
Erosion and Sedimentation	-VE	1	2	4	2	М	L

# 10.1.8. GENERATION OF WASTE

This can be in a form of rubble, cement bags, pipe and electrical wire cuttings. The waste should be gathered and stored in enclosed containers to prevent it from being blown away by the wind. Contaminated soil due to oil leakages, lubricants and grease from the construction equipment and machinery may also be generated during the construction phase.

Oil leakages, lubricants and grease must be detected and addressed. If contaminated soil is detected, it must be removed and disposed of at a hazardous waste landfill. The contractor must provide containers on-site, to store any hazardous waste produced. Regular inspection and housekeeping procedure monitoring should be maintained by the contractor.

# Impact Evaluation

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Signific	ance
	1,760					Unmitigated	Mitigated
Waste	-VE	1	1	4	2	М	L

# 10.1.9. CONTAMINATION OF SURFACE WATER

Contamination of surface water might occur through oil leakages, lubricants and grease from the equipment and machinery during the installation, construction and maintenance of bulk services at the site. Oil spills may form a film on water surfaces in the nearby streams causing physical damage to water-borne organisms.

Machinery should not be serviced at the construction site to avoid spills. All spills should be cleaned up as soon as possible. Hydrocarbon contaminated clothing or equipment's should not be washed within 25m of any surface water body.

#### Impact Evaluation

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Signific	ance
	1,40					Unmitigated	Mitigated
Surface water	-VE	2	2	4	3	М	L

# 10.1.10. TRAFFIC AND ROAD SAFETY

All drivers of delivery vehicles and construction machinery should have the necessary driver's licenses and documents to operate these machines. Speed limit warning signs must be erected to minimise accidents. Heavy-duty vehicles and machinery must be tagged with reflective signs or tapes to maximize visibility and avoid accidents.

#### Impact Evaluation

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Signific	ance
	.,,,,					Unmitigated	Mitigated
Traffic	-VE	2	2	4	3	М	L

# 10.1.11. FIRES AND EXPLOTIONS

There should be enough water available for firefighting purposes. Ensure that all firefighting devices are in good working order and they are serviced. All personnel must be trained about responsible fire protection measures and good housekeeping such as the removal of flammable materials on site. Regular inspections should be carried out to inspect and test firefighting equipment by the contractor.

#### Impact Evaluation

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Signific	ance
						Unmitigated	Mitigated
Fires and Explosions	-VE	2	2	4	2	М	L

# **10.1.12. SENSE OF PLACE**

The placement, design and construction of the proposed project should be as such as to have the least possible impact on the natural environment. The proposed activities will not have a large/negative impact on the sense of place in the area since it will be constructed in a manner that will not affect the neighbouring land and it will not be visually unpleasing.

#### Impact Evaluation

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Signific	ance
	71					Unmitigated	Mitigated
Nuisance Pollution	-VE	1	1	2	2	L	L

# 10.2.IMPACTS DURING OPERATIONAL PHASE

# 10.2.1. ECOLOGICAL IMPACTS

Staff, managers and clients should only make use of walkways and existing roads to minimise the impact on vegetation. No firewood may be collected on the site. Minimise the area of disturbance by restricting movement to the designated working areas during maintenance and drives.

### Impact Evaluation

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Signific	ance
						Unmitigated	Mitigated
Ecology Impacts	-VE	1	2	4	2	L	L

# 10.2.2. DUST POLLUTION AND AIR QUALITY

Vehicles transporting goods and staff will contribute to the release of hydrocarbon vapours, carbon monoxide and sulphur oxides into the air. Possible release of sewer odour, due to sewer system failure of maintenance might also occur. All maintenance of bulk services and infrastructure at the project site must be designed to enable environmental protection.

During operation at the project site dust could be produced through offloading and loading trucks and by the operations of the processing and packaging plant. Transport busses could also contribute to dust. Dust can be prevented by spraying grey water on the roads and on the working areas. It is recommended that regular dust suppression be included in the construction activities, when dust becomes an issue. No unnecessary revving of

engines or operation of vehicles is allowed. In general, the servicing of these extensions is envisaged to have minimal impacts on the surrounding air quality.

#### Impact Evaluation

Aspect	Impact Scale Type		le Duration Magnitude	Probability	Significance		
	,					Unmitigated	Mitigated
Dust & Air Quality	-VE	2	2	4	4	M	L

# 10.2.3. CONTAMINATION OF GROUNDWATER

Spillages might also occur during maintenance of the sewer system. This could have impacts on groundwater especially in cases of large sewer spills. Proper containment should be used in cases of sewerage system maintenance to avoid any possible leakages. Oil and chemical spillages may have a heath impact on groundwater users. Potential impact on the natural environment from possible polluted groundwater also exits.

#### Impact Evaluation

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Groundwater contamination	-VE	2	2	4	2	М	L

# **10.2.4. GENERATION OF WASTE**

Household waste from the activities at the project and from the staff working at the site will be generated. This waste will be collected, sorted to be recycled and stored in on site for transportation and disposal at an approved landfill site.

#### Impact Evaluation

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Signific	ance
						Unmitigated	Mitigated
Waste Generation	-VE	1	2	2	2	M	L

# 10.2.5. FAILURE IN RETICULATION PIPELINES

There may be a potential release of sewage, storm-water or water into the environment due to pipeline/system failure. As a result, the spillage could be released into the environment and could potentially be health hazard to surface and groundwater. Proper reticulation pipelines and drainage systems should be installed. Regular bulk services infrastructure and system inspection should be conducted.

#### Impact Evaluation

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Signific	ance
	,,					Unmitigated	Mitigated
Failure of Reticulation Pipeline	-VE	1	1	4	2	М	L

# 10.2.6. FIRES AND EXPLOTIONS

Food will be prepared on gas fired stoves. There should be enough water available for firefighting purposes. Ensure that all fire-fighting devices are in good working order and they are serviced. All personnel must be trained about responsible fire protection measures and good housekeeping such as the removal of flammable materials on site. Regular inspections should be carried out to inspect and test firefighting equipment by the contractor.

#### Impact Evaluation

Aspect	Impact Type	Impact Scale Type		ale Duration Magnitude	Probability	Significance	
	,,,,,					Unmitigated	Mitigated
Fires and Explosions	-VE	2	1	4	2	М	L

# 10.2.7. HEALTH, SAFETY AND SECURITY

The safety, security and health of the labour force, employees and neighbours are of great importance, workers should be orientated with the maintenance of safety and health procedures and they should be provided with PPE (Proper Protective Equipment). Workers should be warned not to approach or chase any wild animals occurring on the site.

No open flames, smoking or any potential sources of ignition should be allowed at the project location. Signs such as 'NO SMOKING' must be prominently displayed in parts where inflammable materials are stored on the premises.

#### Impact Evaluation

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Signific	ance
	,,,,,					Unmitigated	Mitigated
Safety & Security	-VE	1	3	4	2	M	L

# 10.3.CUMMULATIVE IMPACTS

These are impacts on the environment, which results from the incremental impacts of the construction and operation of the proposed project when added to other past, present, and reasonably foreseeable future actions regardless of what person undertakes such other

actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period. In relation to an activity, it means the impact of an activity that in it may not become significant when added to the existing and potential impacts resulting from similar of diverse activities or undertakings in the area.

Possible cumulative impacts associated with the proposed project includes sewer damages/maintenance, vegetation and animal disturbance, uncontrolled traffic and destruction of the natural environment. These impacts could become significant especially if it is not properly supervised and controlled. This could collectively impact on the environmental conditions in the area. Cumulative impacts could occur in both the construction and operational phase.

# Impact Evaluation

Aspect	Impact Type	Scale	Scale Duration	Magnitude	Probability	Significance	
	1,75					Unmitigated	Mitigated
Cumulative Impacts	-VE	1	3	4	3	L	L

# 11. INCOMPLETE OR UNAVAILABLE INFORMATION

The exact amount of people that will be employed in the construction phase will depend on the type and scope of the project. The Environmental Management Plan (EMP) will therefore include all the possible negative effects of the project in general that could be operated on the site in order to prevent any pollution or harmful impacts whether to neighbours or the environment.

# 12. NEED AND DESIRABILITY

Municipal services will be provided to the town of Katwitwi. Employment opportunities will be created, which will help alleviate poverty and enhance the quality of life for the people involved, especially the local people. Unemployment is a major concern in Namibia and therefore there certainly is a need for individuals to find jobs and earn a living. This project can provide employment to individuals that are skilled and semi-skilled.

According to the information mentioned above, it is believed that there is a need and desirability for the project. The proposed project is desirable as the study area is suitable for the proposed operations, the activities will have a limited impact on the bio-physical environment, enough water is available for construction and proper accesses can be provided to the proposed operations.

Determining what the impact of the operations would be are broken down into different categories and environmental aspects and dealt with in the Environmental Management Plan (EMP). As per the ISO 14001 definition: an environmental aspect is an element of an organization's activities, products and/or services that can interact with the environment to cause an environmental impact e.g. land degradation or land deterioration among others, that will cause harm to the environment.

All concerns and potential impacts raised during the public participation process and consultative meetings were evaluated. Predictions were made with respect to their magnitude and an assessment of their significance was made according to the following criteria:

The Nature of the activity: Municipal services will be constructed in Katwitwi. The possible impacts that may occur are water will be used in the construction phase, waste water will be produced that will be handled by the proponent, land will be used for the proposed activities, few shrubs/grasses might be removed, noise and dust might be created and general construction activities will take place.

The Probability of the impacts to occur: The probability of the above-named impacts to occur and have a negative or harmful impact on the environment and the community is small since the Environmental Management Plan will also guide these activities. Water will still be used, and wastewater produced, however guidelines will be set that will ensure the impact is minimum.

The Extent of area that the project will affect: The specific project will most likely only have a small impact on the proposed project site itself and not on the surrounding or neighbouring land except for possible noise, traffic, machinery, roads and dust and there may be a visual impact because of the proposed operations. Therefore, the extent that the project will have a negative impact on is not extensive.

The Duration of the project: It is estimated that the construction will take place over 1 year however the exact duration of the activities is uncertain.

The Intensity of the project: The intensity of the project is mostly limited to the site however for the above-named processes where the intensity of the project will be felt outside the borders of the project site.

According to the information that was present while conducting the Environmental Impact Assessment Renewal for the construction and operations of the project, no high-risk impacts were identified and therefore it is believed that the operations will be feasible in the short and long run. Most of the impacts identified were characterized as being of a low impact on the receiving and surrounding environment and with mitigation measures followed, the impacts will be of minimum significance or avoided.

# 13. CONCLUSION

In line with the Environmental Management Act (No 7 of 2007), *Green Earth Environmental Consultants* have been appointed to conduct an Environmental Impact Assessment Renewal for the proposed provision of Municipal Services at Katwitwi Village, Kavango West Region that may not be undertaken without a renewed Environmental Clearance Certificate.

The specific site has the full potential to be used for the proposed activities. It is believed that the activities will not have a severe negative effect on the environment. It is also

believed that this project can largely benefit the sewage/economic/employment needs of the area.

The negative environmental impacts that may be visible in the construction and operational phase of the project include increases in solid waste generation and wastewater generation can result in an increase in traffic on the nearby roads, there can be an impact on the occupational health and safety of workers and dust and noise might be created. As a result of the above-mentioned possible negative impacts on the receiving and surrounding environment, an Environmental Management Plan (EMP) is required to eliminate and guide the operational phase of the project. The operations of Denchi Consulting Engineers are believed to be an asset because municipal services will be obtained and employment will be made available for which there is a need.

After assessing all information available on this project, *Green Earth Environmental Consultants* are of the opinion that the project of Denchi Consulting Engineers will not have a large impact on the environment. The accompanying EMP will focus on mitigation measures that will remediate or eradicate the negative or adverse impacts.

# 14. RECOMMENDATION

It is therefore recommended that the Ministry of Environment, Forestry and Tourism through the Environmental Commissioner support and approve the Environmental Clearance Renewal for: *the proposed construction and operation of municipal services at Katwitwi Village, Kavango West Region* and to issue an Environmental Clearance for the following 'Listed Activities':

### ENERGY GENERATION, TRANSMISSION AND STORAGE ACTIVITIES

- 1. The construction of facilities for -
- (b) the transmission and supply of electricity.

# WASTE MANAGEMENT, TREATMENT, HANDLING AND DISPOSAL ACTIVITIES

- 2.1 The construction of facilities for waste sites, treatment of waste and disposal of waste.
- 2.2 Any activity entailing a scheduled process referred to in the Atmospheric Pollution Prevention Ordinance, 1976.
- 2.3 The import, processing, use and recycling, temporary storage, transit or export of waste.

# **WATER RESOURCE DEVELOPMENTS**

8.6 Construction of industrial and domestic wastewater treatment plants and related pipeline systems.

#### **INFRASTRUCTURE**

- 10.1 The construction of-
- (a) oil, water, gas and petrochemical and other bulk supply pipelines
- (b) public roads

- 10.2 The route determination of roads and design of associated physical infrastructure where -
- (a) It is a public road
- (b) the road reserve is more than 30m wide, or
- (c) the road caters for more than one lane of traffic in both directions.

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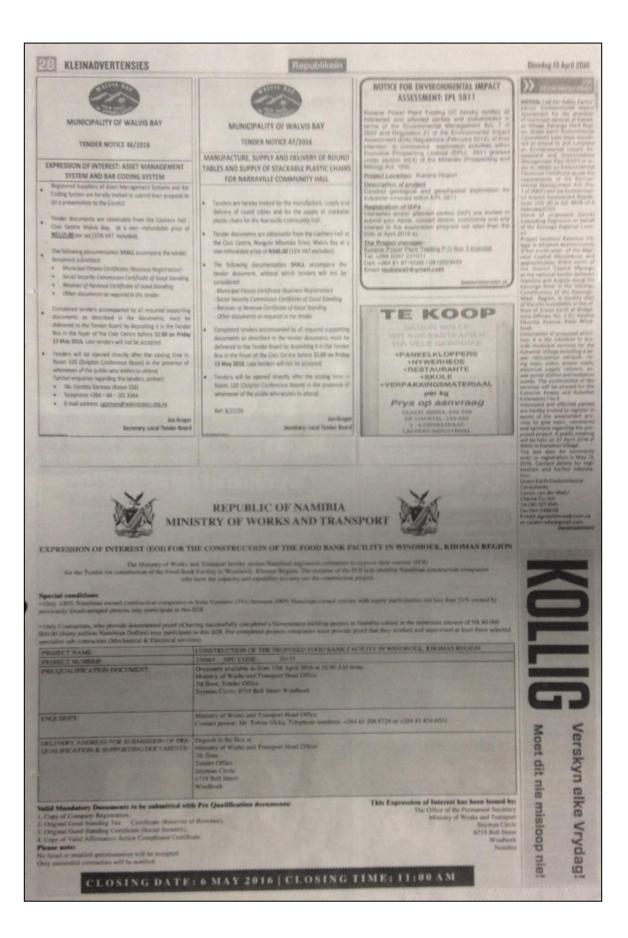
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#### APPENDIX A: NEWSPAPER NOTICES





ERASTUS KANDI AMUPOLO 1941

SECONG APPLICANT

TRANSHAMIS HOLDINGS LIMITED 19T RESPONDENT

STEPMORY SIVESTMENT 12TH RESPONDENT

WETU MULTI INVESTMENT 32ND RESPONDENT

KEETMANS LION FORCE SECURITY SETH RESPONDENT KATIMBO SECURITY

TRIPPLE ONE INVESTMENT

SERVICES SOTH RESPONDENT

NISS SETH RESPONDENT

CHISUMA MULTI SERVICES 30TH RESPONDENT

OTAMARZI SECURITY SERVICES 42NO RESPONDENT

CHORE SECURITY 46TH RESPONDENT

MAYPIELD PROTECTION SERVICES 49TH PESPONDENT IPUMBU INVESTMENT SERVICES SUTH PESPONDENT

BY ORDER OR THE COURT REGISTRAR

Notice is given that an appli-cation in terms of the Liquor Act, 1998, particulars of which appear below, will be made to the Regional Liquor Liceraing. Committee, Region: OSHANA

YETU COSEPLEX.

1. Nature and celebral of appli-cation: PBSTANPART LIGHDSI LIGHBES.

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Any objection or welfare submis-sions term of ecotion 25 of the Action stations to the application many beared or deviced to the Septiment of the Committee to reach the Secretary not less than 21 days before the case of the resemble of the Committee or action to Secretary not less than 21 days before the case of the resemble of the Committee of the Welf of the Committee of the

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INDUSTRY LIQUOR ACT 1996
NOTICE OF APPLICATION TO
A COMMITTEE TENIES OF
THE LIQUOR ACT 1996
(regulations 14, 28 & 33)
Planning Consoltants
Planning Consoltants
PO Soc 11896
Windows

CLAO1600G3332 NOTICE

Applicant Shabenrasich Planning Consultants PO Box 11809 Windhold Tal. (961) 51189 Pel. WH6020 CLAO1600033223

The last date for comments and/or registration is May 13, 2016. Contact details for registrationd further information:

CLAO160002874









**GREEN EARTH Environmental Consultants** 

# APPENDIX B: NOTICE ON SITE



# APPENDIX C: LIST OF I&APs

Email Address:	Name:
dePaauwe@ra.org.na	Roads Authority
didi.kleingunther@nampower.com.na	NamPower
plessisn@namwater.com.na	NamWater
info@namwater.com.na	NamWater
ilekaa@growas.org.na	Department of Water Affairs and Forestry
numbalap@namwater.com.na	NamWater
nat.control@nampower.com.na	NamPower
ncciinfo@ncci.org.na	NCCI

# APPENDIX D: LIST OF ATTENDEES

	Green Earth ENVIRONMENTAL CONSULTANTS	Mrs .	
Date:			
Attendance Register:			
Name & Surname:	Nature of Interest/ Impact:	Contact Details (phone number and email address):	Signature:
Manengy Fransisco	Settlement Commity member 0816220632	0816220632	Mala
AMON Moses T	Settlement Committee Maries 0818967184	NB14181	Mylos
KANIMINE MICKODENS	COMMIT	0817845181	Alexander of the second of the
ANTON KAMBINDA	Commity	0816665680	
Hairwa Salsaria	Commity	0815638291	

Name & Surname:	Nature of Interest/	Ontact Details (phone	Signature:
		ramper and email address).	
Simupureni Anton	Commity	N/A	S.A
Lihing Paulus	Comming	08/3574284	Saulus
Chameya Samuel	Corprisy	401859180	Cfamea
Murupe Symali	compity	9080192 180	A MAN AND A MAN AND AND AND AND AND AND AND AND AND A
Nijivi Othifred	Commity	0814696753	NEW
Nisho Paulus	Commity	D815878624	Dodle
Plurceni Ester T	Commit-1	02.8805 190	and
Mutango Kambungo	Villagers	2813132777	M-K
Ntjamba Selma	Villagers	0813097846	72
Kanyumbe lempi	Viliagers	0817690858	

Name & Surname:	Nature of Interest/ Impact:	ntact Details (phone number and email address):	Signature:
Ntjamb a Freedy	Villagers	0813115911	7.5
Adsanga Frenanda	Villagers	NA	Ĭ,
Muha Salsaina	Headman	0812168694	Muhq.5
Ngoma Mortha	Villagers	N/A	N.M
Dimwiza Elina	Villagers	08/8353/7/	S. E.
My Kamwengo Alfeus	Villagers	6816667749	Arfeas
Jonas Macheal	Villagers	0813793070	1 July
Kanzware Micheal	Villagers	0818857525	Micheal
Sigweda Pamus, S	Villagers	0817250266	Slvanda.
KATE NOW HAUSING	Willpyers	0818172244	M

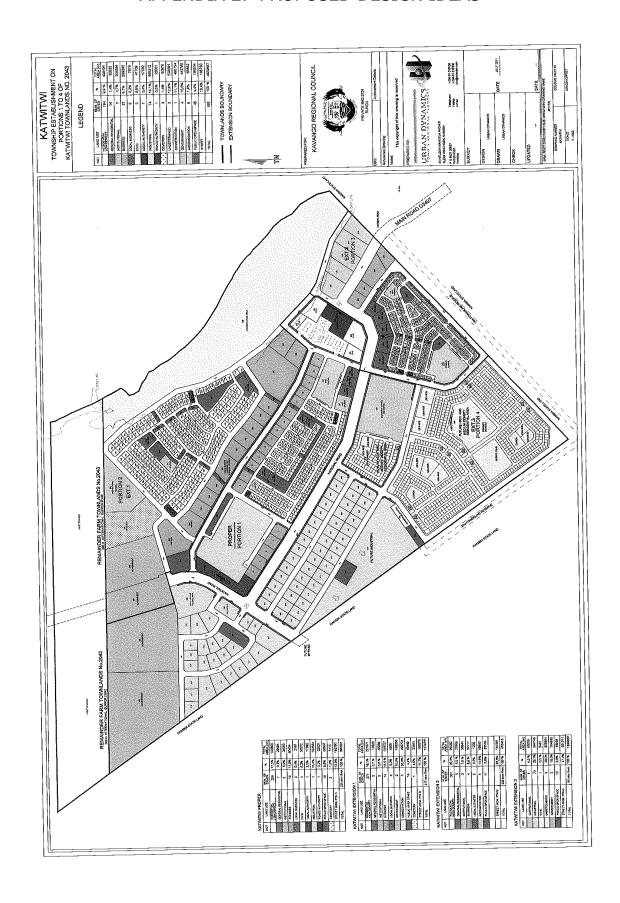
Name & Surname:	Nature of Interest/ Impact:	ntact Details (phone number and email address):	Signature:
Whole Shuranus	Villoger	C813547 803 (57) 1330965 114-20065	Mysoms
Silm Kannundire	villager	0813W75360	Kamasina
Zuani Regina	Whages		Regio
Marga Ameria	Je Mager		Thresie
Adrianu talayi. Richard M Shitongo	theing theing and theing	0818857509 buny 0812183545 mem 160018545090 gmae 1. cont	tulassi.
Mika P Sorafing	Milogers	08139591000	- Almiles
Kambanzara Secilla	Villagers	08/6726241	K.S
Kanzare Hisikia	Villagers	2/4	ING
ANTIN HELLENA S.	VILLAGACES	0815838179	Surga

Name & Surname:	Nature of Interest/ Impact:	htact Details (phone number and email address):	Signature:
DISMIR! RECIIMA N	VILLAGERS	1/4	5.8
Nifama S	Villagers	NA	N.S
Moseka Regina	NIVACPERS	0817725886	m&
Kanzware Kakrina	Villagers	2813827482	18K
REASON MERCIE	とより	51217130	Da de Sico
News Waxuer	Denote Consultan	0811272529	1
15	Senthi Consulting	0813600777	Hamp
Musandumba Elisabeth	Villogers	0814960578	
Chameya Sarafina	Villagers	2/A	C.5
NZwak Sulia	Villagers	0812403897	L'N

burname	nature of Interesti Impact	Contact Details Phone Number	Signature
Elias munhundy	Villager	0817116684	elio
(2) Kandere Mykundy	Villager	08199085583818	fuld
(3) Nurquin Samuel	Villager	NIA	Nign-
(4) Rukano Mathias	Headman of Jugura V	N/A	Rm
(51 Masongo Eynike	Vinagers	N/A	19E
(6) Rukano Christine	Villagei	0818888124	MAKA
(7 NSeu Auxina	Villager	081	Sambu
(8) Nodara Anna	Villages	NA	Anna
(9) MUKUVA BISIER	Villager	NA	Karbi
10) Harria Selma	Allage	MA	Seima
Pin Simpandi Thouhi	Village	NH 681 MA	Thouh.
(12) Netuma Anna	villager	NA	NEF
1131 Nefuma Regina	vellager	0812168371	Nos
(14) Haindere NehePo	rellagr	N/A	# 63
(15/Hairdere Kalango	Vella 9er	N/A	卅水
(16) Kamisi nepya	vellager	N/A	Brs
(17) Hairwa pmarka	vellager	0813355229	H.M
(18) Hairwa Regina	Vellager	N/A	H-R
(19) # Komisi Mortho	vellager	NA	M.m
Doimbilisa martia	Ullager	0814088364	mbnisu
21 Haritha criston	dillager	MA	H.C
(22) muan lumba. E	Villader	NA	
(3) Nefuna Anna	Villager	NA	
(24) Cristene Masek	villager	NA	
(25) Zulyana Nowami	villager	N/A	Zulyana
26 Champa Alminola	Villager	n/A	Aimmda
(27) Mzwaki Julia	Willager	NBA	Julice
coult or man albertina			
(281 Lyononga Albertina	Village		
(29) hamanya hidia			

burname	Impact Interest/	Contact Details Phone Number	Signature
busano kaling	Villages	Ala	RK
31 Anton Elizabeth	Villager	NA	AE
32 Katengo Andjetiny	Villagers	0816402860	Andrinu
33 Malengi petrus	Villagers	0816131952	Mipera
34 Mukoso Biremo	Villagers	08/7073449	ups
35 Nodara Nodara	Villagors	0814622210	A.I
36 Hamutenya Johanes	Villagers	0815840086	#35
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# APPENDIX E: PROPOSED DESIGN IDEAS



Oxidation Pond Design for the Katwitwi Village Settlement, Kavango-West Region

Oxidation Pond Design for the Katwitwi Vinage Se  Description	Number	Persons/erf		Total Population
Current Population (Current Nr of Erven)	986		5	4930
Design Population (20years future population)	i=3.055%	n=20		9000
Total				9000

i = current population growth rate

n = Design Population duration in years

				130
Sewage Flow/Person /Day (I)				1170000
Total Hydraulic Load (I/day)	9000		130	
Total Hydraulic Load (m3/day)				1170
				50
BOD/Person/day (g)				200
VOLR [(in g BOD5/m³/d)		T		DOL
	Total Nr Persons	BOD		
Dialy Organic Load (DOL)	9000		50	450000

zobie Bonde

Sizing Anaerobic Ponds	<del></del>	- 2
Recommended Depth (m)		750
Area (m2)		750
Two Anerobic Ponds	2	375
		11
Length (2) Width (1)		35
$\frac{DOL [in g BOD/d]}{V (m^3) = VOLR [(in g BOD5/m^3/d)]}$		2250

Sizing Primary Ponds

0.450
4050
101250
1.3
319
319

Sizing of Secondary Ponds

Retention Days	10
Water depth	1.3
Voulme	11700
Area	9000
Length	57
Width	160

# **Maturation Ponds**

Retention Days	14
Water depth	1.3
Voulme	16380
Area	12600
Length	158
Width	80

# **Evoporation Ponds**

A <sub>ev</sub> (m²) = (365.Q.)/(Nett E/1 000)	
Q = Total volumetric daily inflow into the ponds (m³/d)	1170
E = Annual evaporation rate (mm/a)	3200
Nett E = Nett annual evaporation rate = 0,7.E – P (mm/a)	1790
P = Annual precipitation (mm/a)	450
Aev = Area required for total evaporation (m²)	238 576
Length	545
Width	438

# APPENDIX F: PUBLIC MEETING PHOTOS











# Ministry of Regional and Local Government, Housing and Rural Development

Tel: (+264 61) 2975111 Fax: (+264 61) 2975096 Government Office Park Luther Street Private Bag 13289 Windhoek Namibia

Enquiries: H van Wyk Tei: (+264+61 297 5230/ 5231) Our Ref: 17/2/2/K19 Your Ref: Date: 18 March 2015

Urban Dynamics Africa P O Box 20837 Windhoek Namibia

Dear Sir

# SUBJECT: PERMISSION TO ESTABLISH THE TOWNSHIP KATWITWI.

- Your letter dated April 2014 has reference.
- Approval has been granted by the Minister on 16 March 2015 in terms of section 6 (2) and 6 (3) of the Townships and Division of Land Ordinance, 1963 (Ordinance 11 of 1963), for permission to establish the township Katwitwi under Townships Board Resolution Item 261/2014 dated 09 September 2014.

Yours faithfully

TOWNSHIPS BOARD SECRETARIAT

All official correspondence must be addressed to the Permanent Secretary

# APPENDIX H: CURRICULUM VITAE OF CHARLIE DU TOIT

1. Position: Environmental Practitioner

Name/Surname: Charl du Toit
 Date of Birth: 29 October 1960

4. Nationality: Namibian

5. Education: Name of Institution University of Stellenbosch, South Africa

Degree/Qualification Hons B (B + A) in Business

Administration and Management

Dooding

\A/ritin a

Date Obtained 1985-1987

Name of Institution University of Stellenbosch, South Africa

Degree/Qualification BSc Agric Hons (Chemistry, Agronomy

and Soil Science)

Date Obtained 1979-1982

Name of Institution Boland Agricultural High School, Paarl,

South Africa

Degree/Qualification Grade 12
Date Obtained 1974-1978

6. Membership of

**Professional** 

**Association:** 

Language

EAPAN Member (Membership Number: 112)

Chaokina

7.	Languages:		<u>S</u>	<u>peaking</u>	Reading	Writing
		English	G	ood	Good	Good
		Afrikaans	G	ood	Good	Good
8.	Employment	<u>From</u>	<u>To</u>	<u>Employer</u>		Position(s) held
	Record:	2009	Present	Green Ear	th	Environmental
				Environme	ntal	Practitioner
				Consultant	S	
		2005	2008	Elmarie Du	ı Toit	Manager
				Town Plan	ning	
				Consultant	S	
		2003	2005	Pupkewitz		General Manager
				Megabuild		
		1995	2003	Agra Coop	erative	Manager Trade
				Limited		

1989	1995	Namibia	Chief Agricultural
		Development	Consultant
		Corporation	
1985	1988	Ministry of	Agricultural
		Agriculture	Researcher

#### Certification:

I, the undersigned, certify that to the best of my knowledge and belief, this CV correctly describes myself, my qualifications, and my experience. I understand that any wilful misstatement described herein may lead to my disqualification or dismissal, if engaged.

\_\_\_\_\_

**Charl du Toit** 

# APPENDIX I: CURRICULUM VITAE OF CARIEN VAN DER WALT

**1. Position:** Environmental Consultant

**2. Name/Surname:** Carien van der Walt

**3. Date of Birth:** 6 August 1990

**4. Nationality:** Namibian

#### 5. Education:

Institution	Degree/Diploma	Years
University of Stellenbosch	B.A. (Degree) Environment and	2009 to 2011
	Development	
University of South Africa	B.A. (Honours) Environmental	2012 to 2013
	Management	

#### 6. Membership of Professional Associations:

EAPAN Member (Membership Number: 113)

# 7. Languages:

Language	Speaking	Reading	Writing
English	Good	Good	Good
Afrikaans	Good	Good	Good

#### 8. Employment Record:

From	То	Employer	Positions Held
07/2013	Present	Green Earth Environmental Consultants	Environmental
			Consultant
06/2012	03/2013	Enviro Management Consultants Namibia	Environmental
			Consultant
12/2011	05/2012	Green Earth Environmental Consultants	Environmental
			Consultant

#### 9. Detailed Tasks Assigned:

Conducting the Environmental Impact Assessment, Environmental Management Plan, Public Participation, Environmental Compliance and Environmental Control Officer

#### Certification:

I, the undersigned, certify that to the best of my knowledge and belief, this CV correctly describes myself, my qualifications, and my experience. I understand that any wilful misstatement described herein may lead to my disqualification or dismissal, if engage.

Carien van der Walt

# APPENDIX J: ENVIRONMENTAL MANAGEMENT PLAN