

***RENEWAL OF THE ENVIRONMENTAL
CLEARANCE FOR THE DECOMMISSIONING
AND RELOCATION OF THE EXISTING
OXIDATION PONDS OF OKONDJATU TOWN***

2021

App – 003057

<p>Project Name:</p>	<p><i>RENEWAL OF THE ENVIRONMENTAL CLEARANCE FOR THE DECOMMISSIONING AND RELOCATION OF THE EXISTING OXIDATION PONDS OF OKONDJATU TOWN</i></p>
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EXECUTIVE SUMMARY

Green Earth Environmental Consultants have been appointed by Denchi Consulting Engineers to attend to and complete an Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) to renew the Environmental Clearance (EC) for the construction of the proposed oxidation ponds outside the Town of Okondjatu and for the decommissioning of the old existing oxidation ponds 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 15 December 2015. 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, the ECC must be renewed.

The existing ponds are in a neglected state, beyond their effective lifespan and within 100m from the nearest residential units and a borehole. These ponds will be decommissioned and replaced by new ponds further away from the township. The main positive impacts of the proposed construction of the new oxidation ponds of Okondjatu Town is that the risk of the contamination of the existing borehole as well as the spreading of bad odors to the residential area will be removed. The construction of the new ponds will create jobs during construction and for in the future management and maintenance as well as improve the quality of life of the people living close to the existing ponds. The negative impacts associated with the construction of the oxidation ponds are the impact on the vegetation, trees, bushes, the natural drainage systems and the loss of farmland during the alignment and construction of the rising main linking the town's sewer network with the ponds and the construction of the ponds. However, 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 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':

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.

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

POSITIVE IMPACTS	NEGATIVE IMPACTS
The sewer generated by the inhabitants and activities of the town will be treated efficiently which will improve the quality of life of the inhabitants.	Building and household waste will be created during construction, dust and noise associated with construction activities and the ponds will have a visual impact.
The risk of contamination of the existing borehole as well as the spreading of bad odours to the residential area will be removed.	Risk of surface and groundwater pollution if system is not properly constructed and maintained.
Employment will be created during construction and in the operational phase.	Vegetation will be destroyed during the construction and animals and birds will 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 of impacts Unmitigated	Significance of impacts Mitigated
Ecology Impacts	-	M	L
Dust and Air Quality	-	M	L
Groundwater Contamination	-	M	L
Waste Generation	-	M	L
Failure of Reticulation Pipeline	-	M	L
Fires and Explosions	-	L	L
Safety and Security	-	L	L

Impact Evaluation Criterion (*DEAT 2006*):

IMPACT EVALUATION CRITERION (<i>DEAT 2006</i>):		
Criteria	Rating (Severity)	
Impact Type	+	Positive
	O	No Impact
	-	Negative
Significance of impacts	L	Low (Little or no impact)
	M	Medium (Manageable impacts)
	H	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 by 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 decommissioning and relocation of the Oxidation Ponds of Okondjatu and for the following “listed activities”:

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.

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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

1. INTRODUCTION

Green Earth Environmental Consultants have been appointed by Denchi Consulting Engineers to renew the Environmental Clearance Certificate for the construction of the proposed oxidation ponds outside the Town of Okondjatu and for the decommissioning of the old existing oxidation ponds 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).

The main septic tank and oxidation ponds of the Okondjatu Settlement are located within 200m of one of the boreholes supplying the settlement of potable water. Both the septic tank and the oxidation ponds have come to the end of their lifespan and are in a state of neglect and require urgent repairs or replacement.

The Okondjatu Settlement is under the management of the Otjozondjupa Regional Council who secured funds from the Ministry of Urban and Rural Development's Trust Fund for the decommissioning of the existing septic ponds and the construction of new facilities. The proponent, Denchi Consulting Engineers, has been appointed by the Otjozondjupa Regional Council to oversee the decommissioning of the existing ponds and the planning and construction of the new ponds. Before the construction can commence, an Environmental Clearance Certificate Renewal must be obtained from the Ministry of Environment, Forestry and Tourism.

An Environmental Clearance Certificate for the proposed activity was obtained on 15 December 2015. 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 ponds, 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:

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.

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

The population of Okondjatu settlement is estimated upon approximately 2500 inhabitants. The Settlement has a large school and hostel, several Government Offices, a clinic, a number of permanent brick houses as well as a number of shops. The school and hostel and some of the houses, offices and shops have been linked via a sewer network and rising main and pump station to a large septic tank and oxidation ponds.



Figure 1: Photo of Town

The septic tank, which has been constructed above ground level and the oxidation ponds are located within 200m from a borehole from which potable water is pumped into the Settlements reservoirs for distribution to the school, hostel, residences, offices and shops. Although the septic tank and especially the ponds are in urgent need of repair and upgrading, the main environmental concern is the fact that the tank and ponds are located so close to the main borehole supplying the town of potable water. It is also very close to ($\pm 350\text{m}$) residential dwellings, the school and the hostel posing a serious problem of odors and smell depending on the direction of the wind. The fence around the ponds has been vandalized which allows uncontrolled access to people, especially children and animals. The existing infrastructure can also not cope any further with the additional sewer created from the growth of the Settlement.



Figure 2: Existing ponds

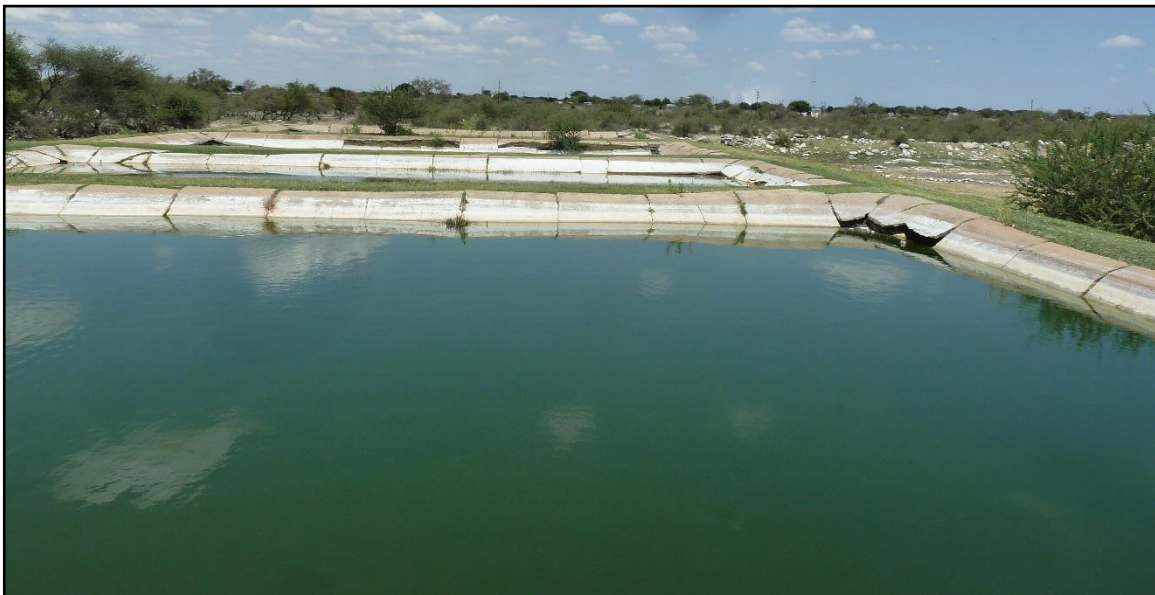


Figure 3: Existing ponds

In terms of the General Guidelines for septic tanks, effluent treatment plants and oxidation ponds:

- Any septic tank or effluent treatment plant must be located at least 0.5 km away from the nearest potable water source.

- The oxidation ponds must be situated at least 1 km away from the nearest residential dwelling.

(Obtained from: Otjozondjupa Regional Council minutes of inception meeting 1 – Project No. 1451)

To address the unhealthy situation, the Otjozondjupa Regional Council decided that the existing septic tank and oxidation ponds of the Okondjatu Settlement must be decommissioned and be replaced by the following infrastructure:

- A new effluent treatment plant and oxidation ponds which will be constructed at least 2km away from the existing settlement.
- A new rising main to connect the sewer system with new ponds.
- An access road to access the new effluent treatment plant and oxidation ponds.
- Upgrading existing sewer pump station to pump the sewer to the new effluent treatment plant and oxidation ponds.
- The lining of the new oxidation ponds with an impermeable liner.
- A new power supply line must be constructed to the effluent treatment plant.

In considering the site, the most important considerations for selecting a suitable site include (obtained from Omitara):

- 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 fairly impermeable underground/soil and the embankments must also be constructed from a fairly 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.
- 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 their 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 (obtained from Omitara):

- 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 designed population for the proposed pumps station, rising main, effluent treatment plant and oxidation ponds for the Okondjatu settlement was based on a population equivalent ± 3000 (2030). To accommodate this, an aerobic pond system was proposed with a capacity of $\pm 195\text{m}^3/\text{day}$ and an associated organic load of 145kg/day.

(Obtained from: Otjozondjupa Regional Council minutes of inception meeting 1 – Project no. 1451)

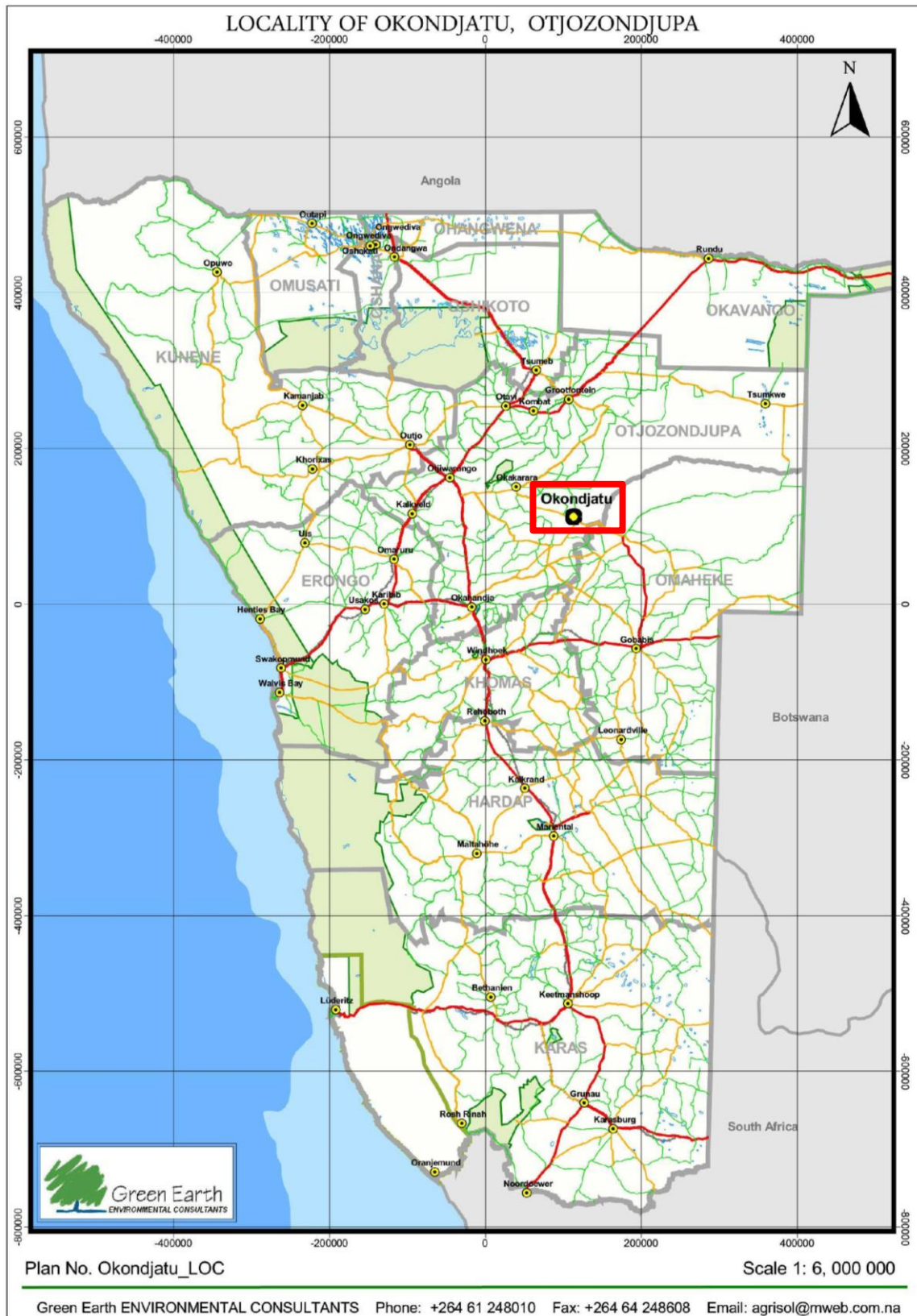


Figure 4: Locality map of Okondjatu Town

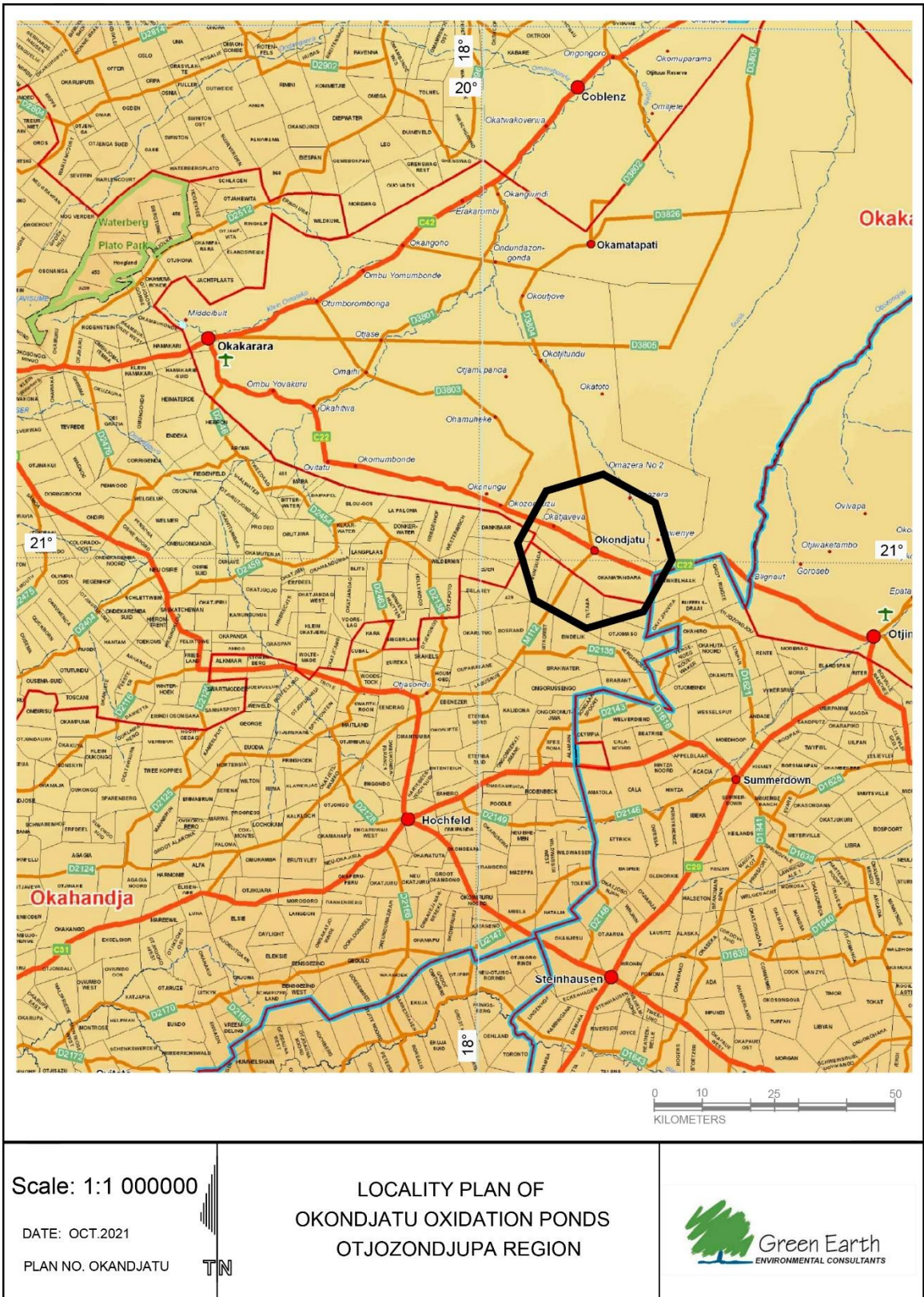


Figure 5: Okondjatu in relation to farms

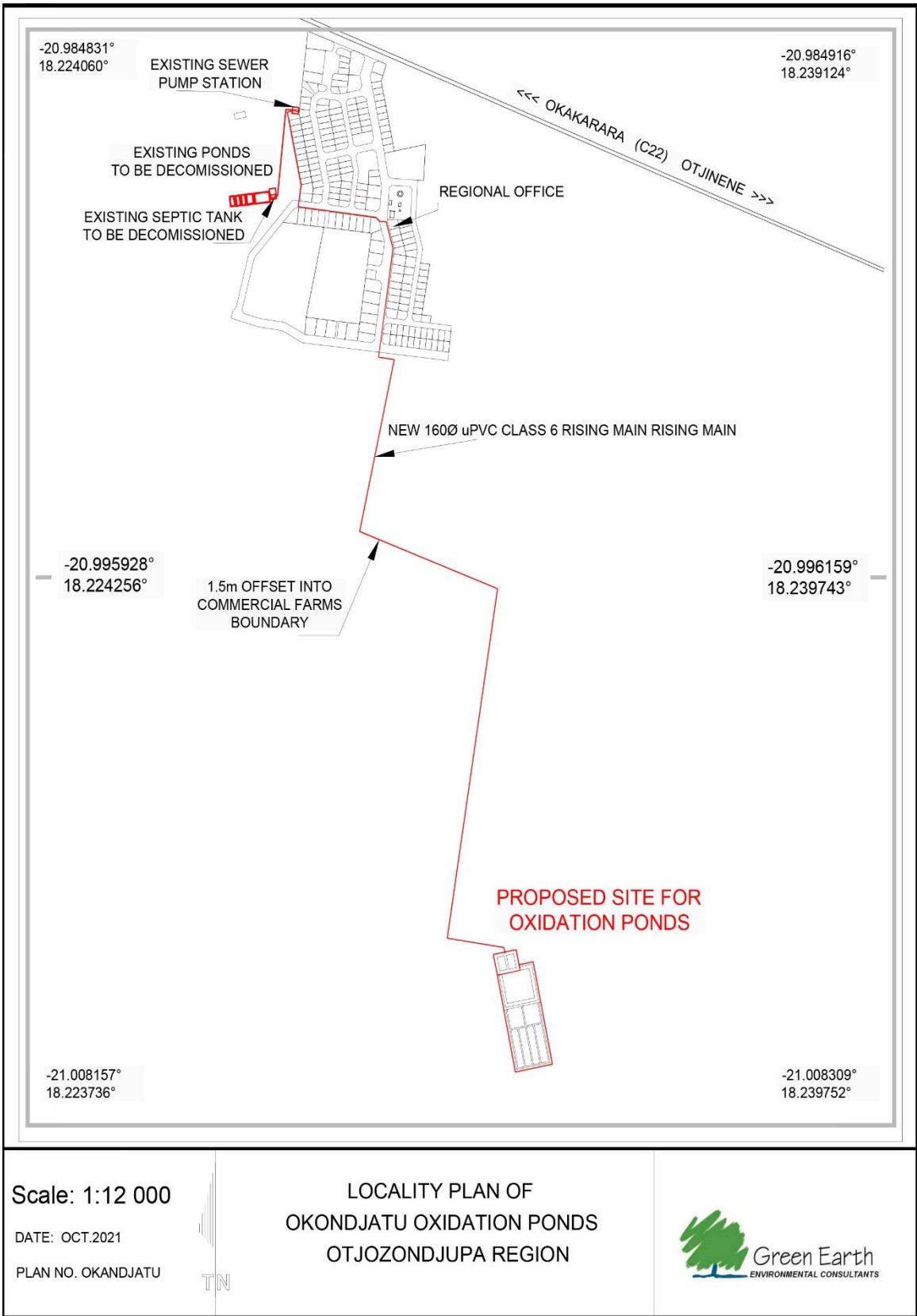
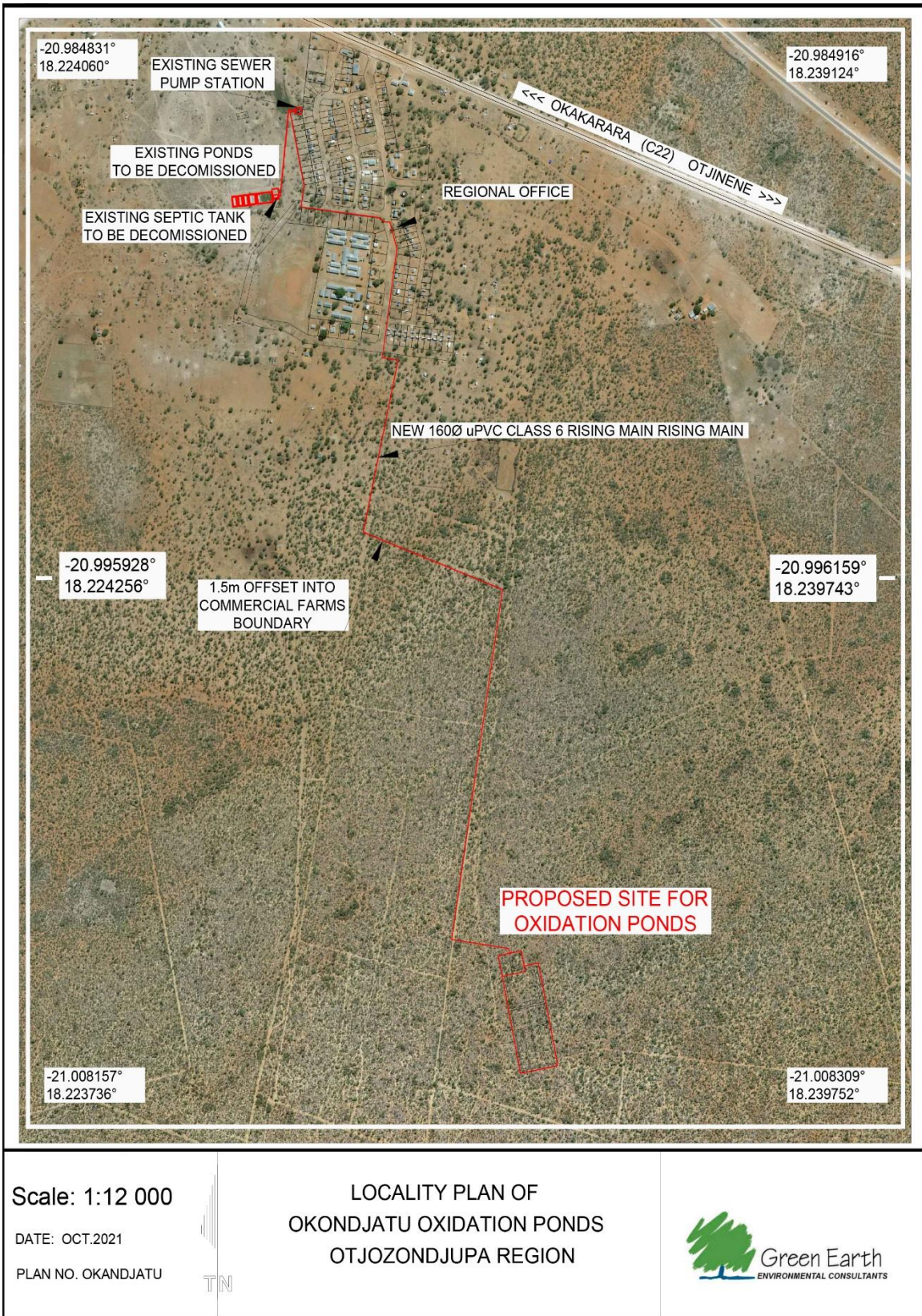


Figure 6: Locality of Oxidation Ponds



Scale: 1:12 000

DATE: OCT.2021

PLAN NO. OKANDJATU



LOCALITY PLAN OF
OKONDJATU OXIDATION PONDS
OTJOZONDJUPA REGION



Figure 7: Locality of Oxidation Ponds on Image

3. OVERVIEW OF POSSIBLE IMPACTS

It is anticipated that the proposed project may have an impact on the following:

- The socio-economic impact on the neighbourhood

Positive: It is expected that the impact that the proposed project will have on the socio-economic environment would be the creation of jobs during construction and the improvement of the living conditions of the people residing close to the oxidation ponds and the more sufficient functioning of the existing sewer system and the elimination of the bad odours associated with the current site.

Negative: The land required for ponds will no longer be available for farming purposes. Odour and smells may have a negative impact on people residing in the vicinity of the new location; however, the ponds are situated a good distance from the proposed ponds.

- Local impact on biodiversity and habitat

Positive: The current ponds are not functioning properly anymore, decommissioning and restoring it will enhance the ambience and environment of the immediate surroundings.

Negative: The creation/construction of the proposed new ponds will lead to the destruction of the natural habitat.

- Water demand impacts

Negative: The new system will demand for more water as it will provide for a larger number of houses, businesses and institutions to be serviced.

- Impact of construction activities/decommissioning on the surface water system

Positive: The decommissioning of the current ponds done properly will be positive because the lining is damaged and this will cause surface water pollution. The decommissioning should be done according to the Environmental Management Plan's requirements.



Figure 8: Current Oxidation Ponds

Negative: The activities may cause surface water pollution if not done according to the Environmental Management Plan's requirements.

- Impact of construction activities on the groundwater system

Negative: The construction of the oxidation ponds may cause ground and surface water pollution if it is not done according to the Environmental Management Plan's provisions.

- Impact of increased movement of heavy vehicles on the road system

Negative: This might have a negative impact on the current gravel roads and also the road to the construction site. Dust will also be created by the moving vehicles.

Positive: This project can encourage/motivate the idea to build tar roads/streets in future for vehicles to be able to move around more easily with less impact to the environment.

- Impact on the immediate and surrounding environment

Negative: The environment may be changed due to the construction of the ponds; new gravel roads will have to be constructed in order for the workers to reach the ponds.

Positive: The current oxidation ponds will be decommissioned and the area will be rehabilitated and cleared of hazardous infrastructure.

- Impact on land use and land rights

Positive: There is a need for the oxidation ponds to be upgraded and for the location of the ponds to change since the current ponds are hazardous to school going children, general neighbours and other residents/visitors of the town.

Negative: The land required for the rising main and ponds will no longer be available for farming purposes.

- Impact on fauna and flora

Negative: The plants, vegetation and animals will have to be removed, moved or damaged and this will also have an impact on the natural beauty of the area however the proposed project site will be situated 1km from the town and will therefore not be visible to the residents of the town. Animals may fall into the new ponds if not properly fenced in.

Positive: The old oxidation ponds will be decommissioned and the natural vegetation will grow back naturally which will enhance the beauty of the area.

- Impact on geology, soils, topography and drainage

Negative: The geology, soils, topography and natural drainage channels may be damaged due to the construction of the oxidation ponds. Soil required for the construction of the access road and ponds has to be obtained from existing gravel pits, the drainage channels may be closed or redirected which might disturb the natural flow of surface water.

- Impact on climate

Negative: The wind may blow bad odour/smells in the direction of the town.

Positive: The ponds will be located some distance of the town as such as to be downwind of the prevailing winds in the area to prevent odours from reaching the towns.

4. APPROVALS OBTAINED

4.1. MINISTRY OF ENVIRONMENT, FORESTRY AND TOURISM

The Ministry of Environment, Forestry and Tourism issued an Environmental Clearance Certificate on 15 December 2015 which expired.

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

See below a copy of the ECC:



REPUBLIC OF NAMIBIA

MINISTRY OF ENVIRONMENT AND TOURISM

Tel: (00 26461) 294 2111
Fax: (00 26461) 229 036

E-mail: inghimwayo@met.na

Enquiries: Mrs. Lavinia Nghimwaya

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15 December 2015

OFFICE OF THE ENVIRONMENTAL COMMISSIONER

The Managing Member
Denchi Consulting Engineers
P. O. Box 80352
Windhoek
Namibia

Dear Sir/Madam

SUBJECT: ENVIRONMENTAL CLEARANCE FOR THE DECOMMISSIONING AND RELOCATION OF THE EXISTING OXIDATION PONDS OF OKONDJATU TOWN, OKAKARARA DISTRICT, OTJOZONDJUPA REGION.

The Environmental Impact Assessment and Environmental Management Plan submitted are sufficient as this have made an adequate provision of the environmental management during your proposed activities. From this perspective regular environmental monitoring and evaluations on environmental performance should be conducted. Targets for improvements should be established and monitored throughout this process.

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

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

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

Yours sincerely,


Teofilus Nghitila
ENVIRONMENTAL COMMISSIONER



"Stop the poaching of our rhinos"

All official correspondence must be addressed to the Permanent Secretary

5. BULK SERVICES AND INFRASTRUCTURE PROVISION

The site is supported by the following services:

5.1.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 town as mentioned above.

5.2.WATER SUPPLY

Water to the new sewer system will be supplied from the dams and the existing water reticulation system of Okondjatu.

5.3.ELECTRICITY RETICULATION

Electricity has to be supplied from the current network to the pumps pumping the sewer to the ponds.

5.4.SEWAGE DISPOSAL

The new septic tank and ponds has to be linked by a new rising main with the existing sewer network.

5.5.SOLID WASTE DISPOSAL/REFUSE REMOVAL

Solids collected from the septic tank and from the oxidation ponds have to be disposed of as per the requirements of the town and disposed of at an approved waste disposal site.

5.6.FIRE PROTECTION

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

6. TERMS OF REFERENCE

The Proponent intends to apply for a renewed Environmental Clearance Certificate for the construction of the proposed oxidation ponds outside the Town of Okondjatu and for the decommissioning of the old existing oxidation ponds. 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, socio-economic 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.

7. 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.

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 on two consecutive weeks inviting public participation and comments on the proposed project were requested. Notices were also displayed in the town.

A public consultative meeting was held on 16 April 2015 at 11:00 near the project site in the Okondjatu Combined School Hall with the residents of the town and any interested member of the community/public.

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.

8. 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. 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.

9. 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, 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:

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.

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 & Policies consulted:		
Electricity Act (No. 4 of 2007)	In accordance with the Electricity Act (No. 4 of 2007) which provides 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.	The Proponent must abide to the Electricity Act.
Pollution Control and Waste Management Bill (guideline only)	The Pollution Control and Waste Management Bill is currently in preparation and is therefore included as a guideline only. Of reference to the mining, Parts 2, 7 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	The Proponent must adhere to the Pollution Control and Waste Management Bill.

	<p>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 subsection (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 person handling hazardous substances, through emergency response plans.</p>	
<p>Water Resources Management Act</p>	<p>The Water Resources Management Act (No. 11 of 2013) stipulates conditions that ensure effluent that is produced to be of a certain standard. There should also be controls on the disposal of 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.</p>	<p>The Ministry of Agriculture, Water and Land Reform must be consulted. Fresh water abstraction and waste-water discharge permits should be obtained when required.</p>
<p>Solid and Hazardous Waste Management Regulations: Local Authorities 1992</p>	<p>Provides for management and handling of industrial, business, and domestic waste.</p>	<p>The Proponent must abide to the solid waste management provisions.</p>
<p>Hazardous Substances Ordinance (No. 14 of 1974)</p>	<p>The Ordinance applies to the manufacture, sale, use, disposal and dumping of hazardous substances, as well as their import and export and is administered by the Minister of Health and Social Welfare. Its primary purpose is to</p>	<p>The Proponent must abide to the Ordinance's provisions.</p>

	prevent hazardous substances from causing injury, ill-health, or the death of human beings.	
Atmospheric Pollution Prevention Ordinance of Namibia (No. 11 of 1976)	Part 2 of the Ordinance governs the control of noxious or offensive gases. The Ordinance prohibits anyone from carrying on a scheduled process without a registration certificate in a controlled area. The registration certificate must be issued if it can be demonstrated that the best practical means are being adopted for preventing or reducing the escape into the atmosphere of noxious or offensive gases produced by the scheduled process.	The proponent should adhere to the stipulations of the Atmospheric Pollution Prevention Ordinance.
Nature Conservation Ordinance	The Nature Conservation Ordinance (No. 4 of 1975) covers game parks and nature reserves, the hunting and protection of wild animals, problem animals, fish, and indigenous plant species. The Ministry of Environment, Forestry and Tourism (MEFT) administer it and provides for the establishment of the Nature Conservation Board.	The proposed project implementation is not located in a demarcated conservation area, national park, or unique environments.
Forestry Act	The Forestry Act (No. 12 of 2001) specifies that there be a general protection of the receiving and surrounding environment. The protection of natural vegetation is of great importance, the Forestry Act especially stipulates that no living tree, bush, shrub, or indigenous plants within 100m from any river, stream or watercourse, may be removed without the necessary license.	No removal of protected tree species or removal of mature trees should happen. The Ministry of Environment, Forestry and Tourism should be consulted when required.
EU Timber Regulation: FSC (2013)	Forest Stewardship Council (FSC) came into effect in March 2013, with the aim of preventing sales of 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	The Proponent is advised to adhere to the regulation.

	used has been legally harvested and, where applicable, exported legally from the country of harvest.	
Labour Act	The Labour Act (No. 11 of 2007) contains regulations relating to the Health, Safety and Welfare of employees at work. These 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).	The proponent and contractor should adhere to the Labour Act.
Communal Land Rights	Communal land is land that belongs to the State and is held in trust for the benefit of the traditional communities living in those areas. Communal land 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.	Consent should be obtained from the Traditional Authorities, Communal Boards, Chiefs, Kings, Queens etc. involved.

<p>Public and Environmental Health Act</p>	<p>The Public and Environmental Health Act (No. 1 of 2015) provides with respect to matters of public 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.</p>	<p>The proponent and contractor should adhere to the Public and Environmental Health Act.</p>
<p>Coronavirus (Covid-19) Pandemic</p>	<p>The current global Coronavirus (Covid-19) pandemic and the associated State of Emergency and health restrictions globally may 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.</p>	<p>The proponent, contractor and workforce should adhere to the restrictions and regulations.</p>
<p>National Heritage Act (No. 27 of 2004)</p>	<p>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.</p>	<p>The National Heritage Council should be consulted when required.</p>
<p>National Monuments Act of Namibia (No. 28 of 1969) as amended until 1979</p>	<p>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</p>	<p>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</p>

	<p>executed by any people who inhabited or visited Namibia before the year 1900 AD: or</p> <p>(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</p> <p>(d) the anthropological or archaeological contents of graves, caves, rock shelters, middens, shell mounds or other sites used by such people; or</p> <p>(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.</p>	<p>will be the responsibility of the developer to take the required route and notify the relevant commission.</p>
<p>Public Health Act (No. 36 of 1919)</p>	<p>Under this act, in section 119: “No person shall cause a nuisance or shall suffer to exist on any land or premises owned or occupied by him or of which he is in charge any nuisance or other condition liable to be injurious or dangerous to health.”</p>	<p>The proponent will ensure that all legal requirements of the project in relation to protection of the health of their employees and surrounding residents is protected and will 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.</p>
<p>Soil Conservation Act (No. 76 of 1969)</p>	<p>The objectives of this Act are to: Make provisions for the combating and prevention of soil erosion; Promote the conservation, protection and improvement of the soil, vegetation, sources, and resources of the Republic;</p>	<p>Only the area required for the operations should be cleared from vegetation to ensure the minimum impact on the soil through clearance for construction.</p>
<p>Air Quality Act (NO. 39 of 2004)</p>	<p>The Air Quality Act (No. 39 of 2004) intends to provide for national norms and standards regulating air quality monitoring, management, and control by all</p>	<p>The proponent and contractor should adhere to the Air Quality Act.</p>

	spheres of government; for specific air quality measures; and for matters incidental thereto.	
Traditional Authorities Act (No. 17 of 1995)	The Traditional Authorities Act (No. 17 of 1995) provide for the establishment of traditional authorities, the designation and recognition of traditional leaders; to define their functions, duties, and powers; and to provide for matters incidental thereto.	Traditional Authorities should be consulted when required.
Vision 2030 and National Development Plans	Namibia's overall development ambitions are articulated in the Nation's Vision 2030. At the 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.	The proposed project is an important element in 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.

A flowchart indicating the entire EIA process is shown in the *Figure* below.

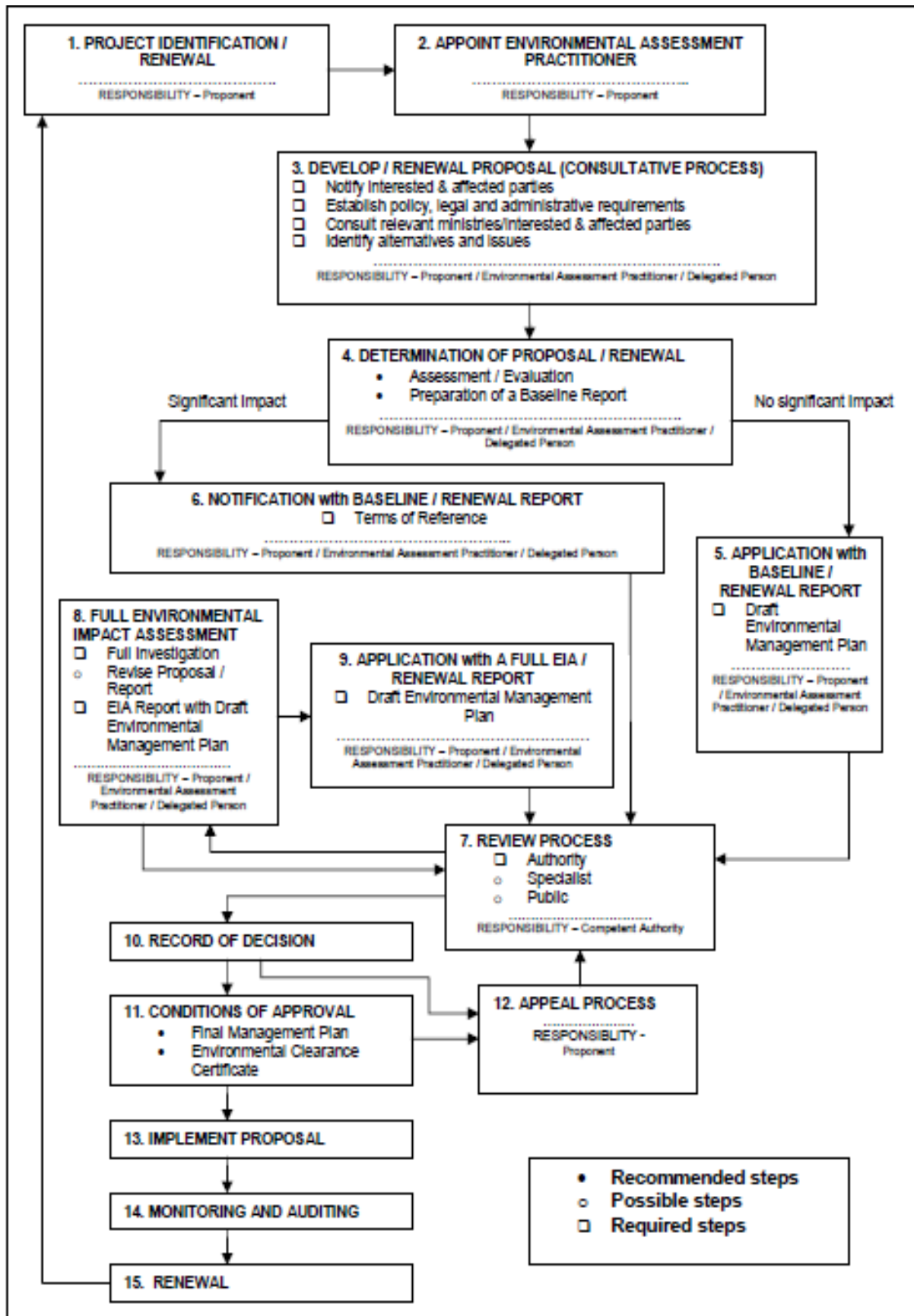


Figure 9: Flowchart of the Impact Process

10. AFFECTED RECEIVING ENVIRONMENT

10.1. BIODIVERSITY AND VEGETATION

The proposed project site which is situated just outside the Town of Okondjatu is currently vacant consisting of undeveloped farmland. Evidence of human inference namely informal tracks are present in the form of farm/gravel roads near the project site. The natural terrain is relatively even as can be seen on the photos of the area and site. No protected trees (especially *Acacia erioloba*) may be removed without a permit. Any removal of vegetation should be done within a properly managed, planned and responsible manner to avoid the destruction of unnecessary ground cover. Birds and small insects were observed on and near the project site when the site visit was carried out, it is recommended that any animal whether large or small be protected and safeguarded from the construction and operation activities that may be harmful. If required, the relocation of animals is the preferred choice. Only the necessary plants/vegetation will be removed for the construction phase. At the moment the area in general is dry.

Topographically there are no special features to be taken into account with the development. The decommissioning of the existing oxidation ponds and the rehabilitation of the disturbed areas is important and should be done in accordance with the Environmental Management Plan (EMP). 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 small.

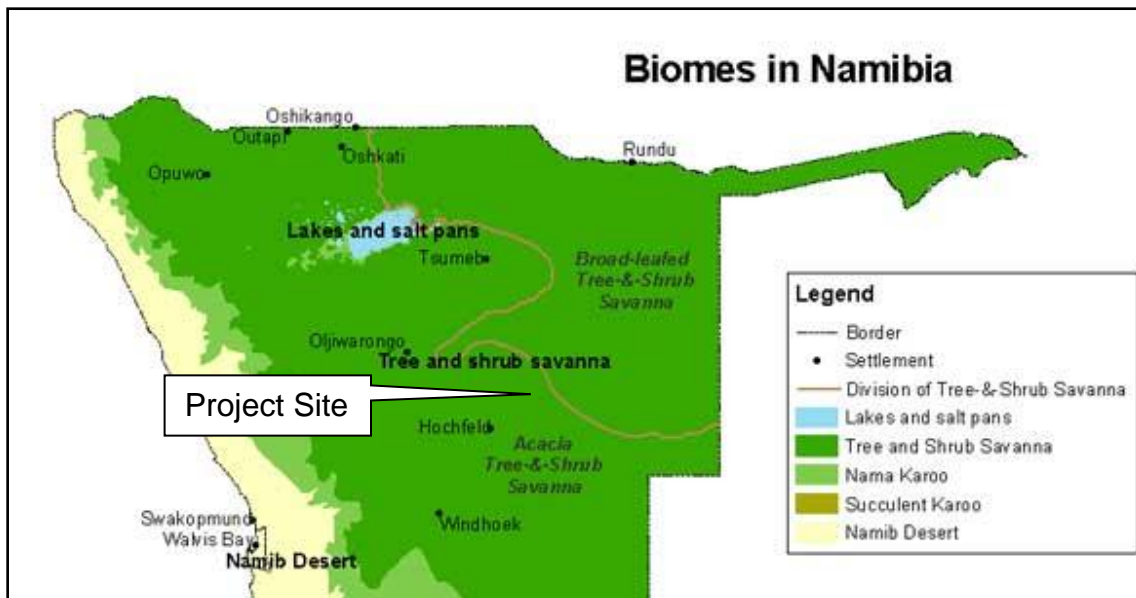


Figure 10: Biomes in Namibia (Atlas of Namibia, 2002)

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.

10.2. CLIMATE

The climate of Okondjatu can be described as semi-arid, with summer rainfalls and highest temperatures occurring during October and February. Maximum temperatures recorded in the area vary just under 40 degrees Celsius with an average annual temperature of more than 22 degrees Celsius (*Weather - the Climate in Namibia, 2012*).

Rainfall in the form of thunderstorms is experienced in the area during the summer months between October and April. It is further characterised by relatively high average mean annual rainfall of 600 - 650mm in comparison to 250mm for the entire country. Over 70% of the rainfall occurs in the period between November and March (*Weather - the Climate in Namibia, 2012*).

The prevailing wind direction is expected to prevent the spread of any nuisance namely noise and smell. The predominant wind in the region is easterly with westerly winds from September to December (*Weather - the Climate in Namibia, 2012*).

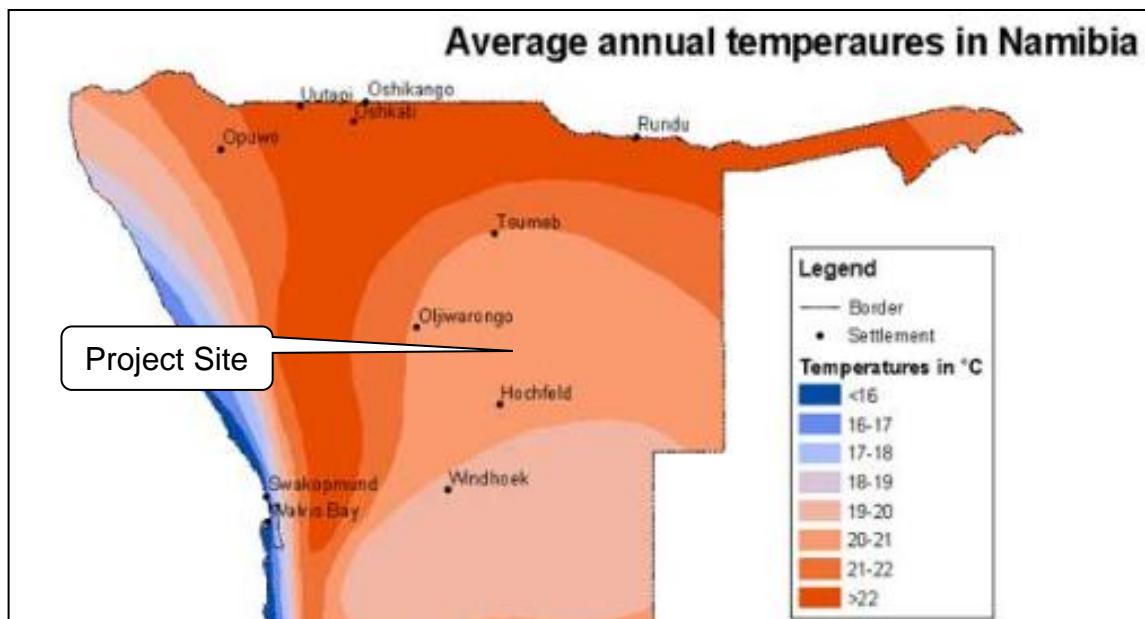


Figure 11: Temperatures in Namibia (*Atlas of Namibia Project, 2002*)

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 thunderstorm.

10.3.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:

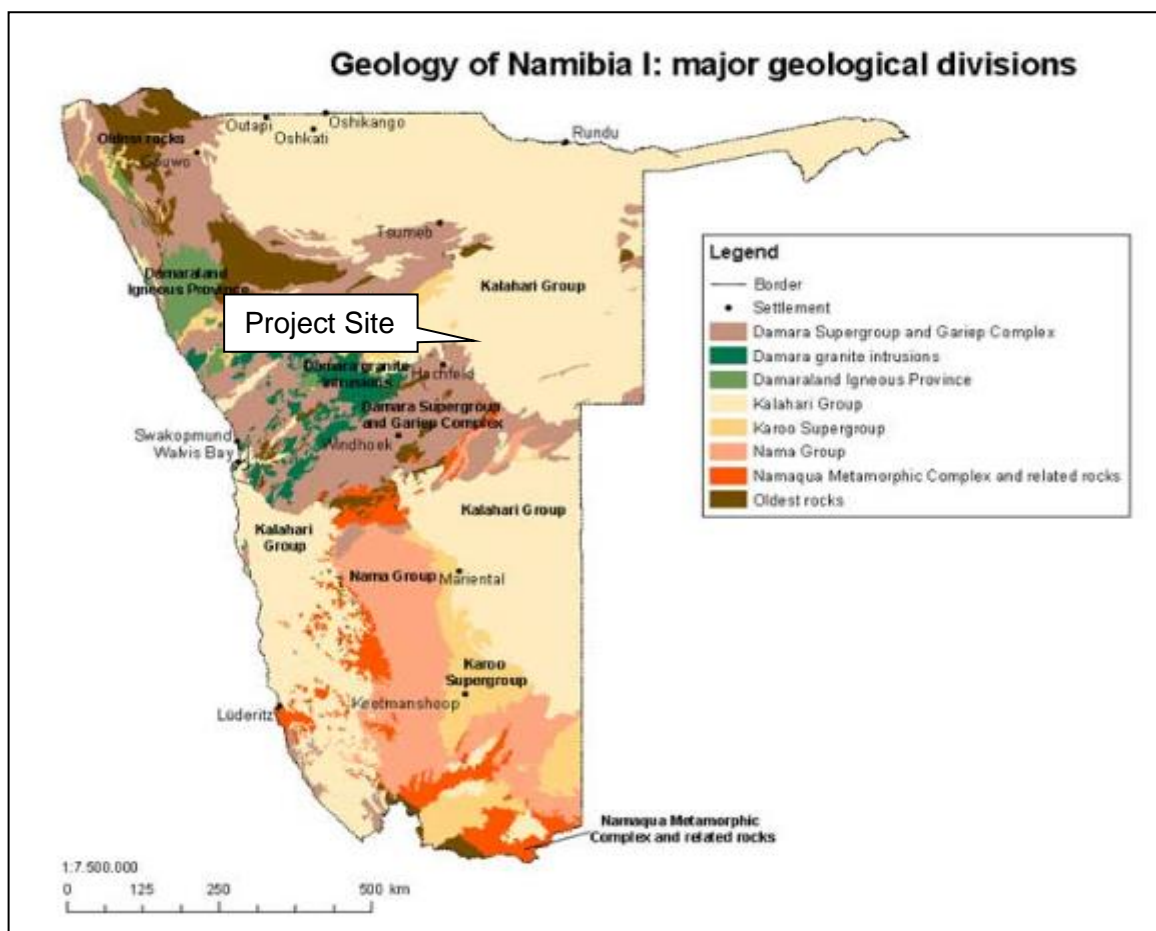


Figure 12: Geology of Namibia (Atlas of Namibia Project, 2002)

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 staining.

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. 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.

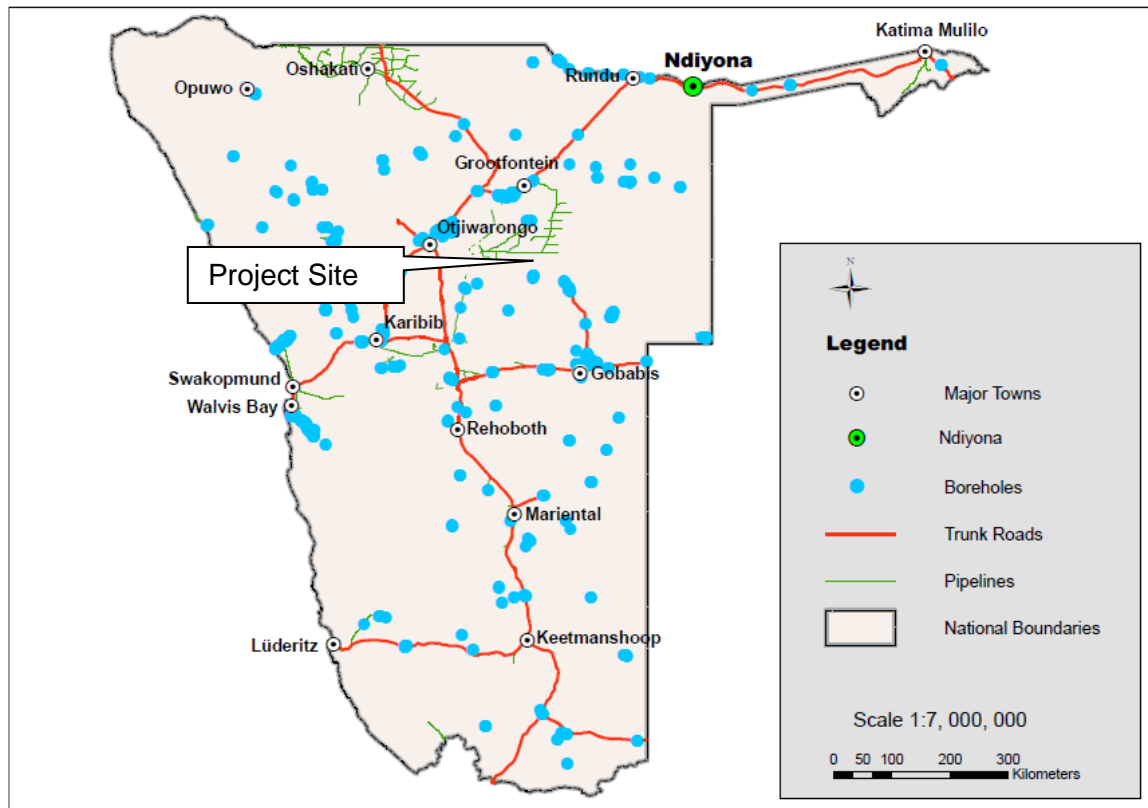


Figure 13: NamWater boreholes

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.

10.4. 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. The infrastructure that will be constructed on the site is believed to have a limited impact on erosion and sedimentation. Drainage channels will be kept open and will be incorporated in the development.

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 or 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.

10.5. SOCIAL-ECONOMIC COMPONENT

Since the majority of land uses around the project site is characterised by residential activities, businesses and farmland, the ponds will not have a drastic negative impact on the neighbours or the surrounding areas. Land will be lost however only the area that will be used for the oxidation ponds and a small buffer zone and a gravel road that will be constructed in order to reach the ponds to keep it in a safe and working order. Since the ponds will be located a distance from the town, bad smells will not reach the residents of the town and prevailing winds will also eliminate the odour. The current oxidation ponds are deteriorated and the infrastructure are broken therefore there exist a need for the new ponds to be constructed for the sewage of the people living in the town.

CONCLUSION AND IMPACT

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

10.6. 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.

CONCLUSION AND IMPACT

No implications or expected impacts.

10.7. 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.

10.8. 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 (Personal 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.

10.9. 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.

11. INCOMPLETE OR UNAVAILABLE INFORMATION

The number of people that will be employed on the site in the construction and operational phases will depend on the type and scope of the construction and operational activities. Currently no exact figures are available.

12. ASSESSMENT AND EVALUATION

The Environmental Impact Assessment sets out potential positive and negative environmental impacts associated with the project site. 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	+	Positive
	O	No Impact
	-	Negative
Significance of impact being either	L	Low (Little or no impact)
	M	Medium (Manageable impacts)
	H	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 on the receiving environment are discussed in the paragraphs below:

12.1. IMPACTS DURING CONSTRUCTION

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

12.1.1. 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 project will make use of water in its construction and operational phase.

Impact Evaluation

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Water	-	2	2	4	2	L	L

12.1.2. ECOLOGICAL IMPACTS

The project will be constructed in a disturbed natural area which is home to little vegetation. Therefore, the impact on fauna and flora will be minimal. Disturbance of areas outside the designated working zone is not allowed.

Impact Evaluation

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Ecology	-	1	1	2	1	L	L

12.1.3. 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. 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. It is recommended that regular dust suppression be included in the construction activities when dust becomes an issue.

Impact evaluation

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Dust & Air Quality	-	2	2	4	3	M	L

12.1.4. NOISE IMPACT

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

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 staff should be equipped with ear protection equipment.

Impact evaluation

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Noise	-	2	2	4	2	M	L

12.1.5. 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 (Personal 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.

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, at all times. 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	-	1	2	4	2	M	L

12.1.6. 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	Significance	
						Unmitigated	Mitigated
Groundwater	-	2	2	4	2	M	L

12.1.7. SEDIMENTATION AND EROSION

The area/project site is sparsely covered by vegetation. The proposed construction and operational activities will not increase the number of impermeable surfaces. The amount of storm water during rainfall events could increase erosion. Proper storm water management measures should be implemented.

Impact Evaluation

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Erosion and Sedimentation	-	1	1	2	1	M	L

12.1.8. GENERATION OF WASTE

This can be in the 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.

The oil leakages, lubricants and grease must be addressed. Contaminated soil 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	Significance	
						Unmitigated	Mitigated
Waste	-	2	2	4	2	M	L

12.1.9. 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.

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 should not be washed within 25m of any surface water body.

Impact Evaluation

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Surface water	-	2	2	4	2	M	L

12.1.10. 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	Significance	
						Unmitigated	Mitigated
Traffic	-	2	2	4	2	M	L

12.1.11. FIRES AND EXPLOSIONS

There should be sufficient water available for firefighting purposes. Ensure that all fire-fighting devices are in good working order and are serviced. All personnel have to 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	Significance	
						Unmitigated	Mitigated
Fires and Explosions	-	2	2	4	2	M	L

12.1.12. SENSE OF PLACE

The placement, design and construction of the proposed infrastructure 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	Significance	
						Unmitigated	Mitigated
Nuisance Pollution	-	1	2	2	2	M	L

12.2. IMPACTS DURING THE OPERATIONAL PHASE

12.2.1. ECOLOGICAL IMPACTS

Staff and visitors should only make use of walkways and existing roads to minimise the impact on vegetation. Minimise the area of disturbance by restricting movement to the designated working areas during maintenance.

Impact Evaluation

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Ecology Impacts	-	2	2	4	2	M	L

12.2.2. 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 or maintenance might also occur. All maintenance of bulk services and infrastructure at the project site has to be designed to enable environmental protection.

Impact Evaluation

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Dust & Air Quality	-	2	2	4	3	M	L

12.2.3. CONTAMINATION OF GROUNDWATER

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

Impact Evaluation

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

12.2.4. GENERATION OF WASTE

Household waste from the activities at the site and from the staff working at the site will be generated. The 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	Significance	
						Unmitigated	Mitigated
Waste Generation	-	1	2	2	2	M	L

12.2.5. FAILURE IN RETICULATION PIPELINES

There may be a potential release of sewage, stormwater 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 a 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	Significance	
						Unmitigated	Mitigated
Failure of Reticulation Pipeline	-	2	2	4	2	M	L

12.2.6. FIRES AND EXPLOSIONS

Food will be prepared on gas fired stoves. There should be sufficient water available for firefighting purposes. Ensure that all fire-fighting devices are in good working order and are serviced. All personnel have to 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	Significance	
						Unmitigated	Mitigated
Fires and Explosions	-	2	2	4	2	M	L

12.2.7. 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 (Personal Protective Equipment). 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	Significance	
						Unmitigated	Mitigated
Safety & Security	-	1	2	4	2	L	L

12.3.CUMULATIVE IMPACTS

These are impacts on the environment, which results from the incremental impacts of the construction and operation of the project when added to other past, present, and reasonably foreseeable future actions regardless of which person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. 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 or diverse activities or undertakings in the area.

Possible cumulative impacts associated with the proposed construction include sewer damages/maintenance, uncontrolled traffic and destruction of the vegetation or the 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 operational and the construction phase.

Impact Evaluation

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Cumulative Impacts	-	2	3	4	2	L	L

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 construction of the proposed oxidation ponds outside the Town of Okondjatu and for the decommissioning of the old existing oxidation ponds 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 new oxidation ponds will be constructed 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 construction of the proposed oxidation ponds outside the Town

of Okondjatu and for the decommissioning of the old existing oxidation ponds and to issue an Environmental Clearance for the following 'Listed Activities':

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.

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APPENDIX A: CURRICULUM VITAE OF CHARLIE DU TOIT

1. **Position:** Environmental Practitioner
2. **Name/Surname:** Charl du Toit
3. **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		
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:** EAPAN Member (Membership Number: 112)

7. **Languages:**

	<u>Speaking</u>	<u>Reading</u>	<u>Writing</u>
English	Good	Good	Good
Afrikaans	Good	Good	Good

8. **Employment Record:**

<u>From</u>	<u>To</u>	<u>Employer</u>	<u>Position(s) held</u>
2009	Present	Green Earth Environmental Consultants	Environmental Practitioner
2005	2008	Elmarie Du Toit Town Planning Consultants	Manager
2003	2005	Pupkewitz Megabuild	General Manager
1995	2003	Agra Cooperative Limited	Manager Trade
1989	1995		Chief Agricultural Consultant

		Namibia	
		Development	Agricultural
1985	1988	Corporation	Researcher
		Ministry of	
		Agriculture	

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 B: 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 Development	2009 to 2011
University of South Africa	B.A. (Honours) Environmental Management	2012 to 2013

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	To	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 C: ENVIRONMENTAL MANAGEMENT PLAN