



**PROPOSED DEVELOPMENT OF AN OXIDATION POND SYSTEM AND
SEWAGE LINES, SCHWEIZER RENEKE, NORTHWEST PROVINCE**

Draft Basic Assessment Report

June 2023

Prepared for:



On behalf of:





Prepared by:

Edmari Lewis
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QUALITY AND REVISION RECORD

QUALITY APPROVAL

	Capacity	Name	Signature	Date
Author	Environmental Consultant (EAPASA Reg: 2021/3452)	Edmari Lewis		05/06/2023
Reviewer	Environmental Consultant and Project Manager (EAPASA Reg: 2019/1311)	Elana Mostert		06/06/2023

This report has been prepared in accordance with the Enviroworks Quality Management System.

REVISION RECORD

Revision Number	Objective	Change	Date
1	Draft Report	- Formatting - Recommendations -	07/06/2023

DISCLAIMER

Even though every care is taken to ensure the accuracy of this report, Environmental Impact Assessment studies are limited in scope, time, and budget. Discussions are to some extent made on reasonable and informed assumptions built on bona fide information sources, as well as deductive reasoning. Since Environmental Impact Assessment studies deal with dynamic natural systems additional information may come to light at a later stage during the impact assessment phase. The author does not accept responsibility for conclusions made in good faith based on own databases or on the information provided. Although the Author exercised due care and diligence in rendering services and preparing documents, he accepts no liability, and the client, by receiving this document, indemnifies the Author against all actions, claims, demands, losses, liabilities, costs, damages, and expenses arising from or in connection with services rendered, directly or indirectly by the authors and by the use of this document. This report should therefore be viewed and acted upon with these limitations in mind.

EXECUTIVE SUMMARY

INTRODUCTION AND BACKGROUND

Moedi Consulting Engineers on behalf of the Dr. Ruth Segomotsi Mompati District Municipality appointed Enviroworks, an Independent Environmental Assessment Practitioner (EAP), to undertake the required Basic Assessment (BA) Process for the proposed development of an oxidation pond system and two gravity outfall sewer pipelines, Northwest Province.

The proposed project is a listed activity in terms of Sections 24(2) and 24(d) of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) (as amended). The Environmental Impact Assessment (EIA) Regulations, 2014 (as amended) promulgated in terms of Chapter 5 of the NEMA provide for the control of certain activities that are listed in Government Notice Regulations No. (GN R) No. R983, R984 and R985 (as amended). Activities listed in these notices must comply with the regulatory requirements listed in GN R No. R982 (as amended), which prohibits such activities until written authorisation is obtained from the competent authority. Such environmental authorisation, which may be granted subject to conditions, will only be considered once there has been compliance with the EIA Regulations, 2014 (as amended). GN R No. 982 (as amended) sets out the procedure and documentation that need to be compiled with undertaking a Basic Assessment Report.

PROJECT DESCRIPTION

Moedi Consulting Engineers on behalf of the Dr. Ruth Segomotsi Mompati District Municipality appointed Enviroworks, an independent Environmental Consultant, for the proposed construction of an oxidation pond system and two gravity outfall sewer pipelines outside the urban area of Ipelegeng township on Portion 1 of the farm Schweizer-Reneke Town and Townlands 62 HO and Portion 21 of the farm Palachoema 64 HO, near Schweizer-Reneke, North West Province (Refer to Figure 2 for the locality map).

The wastewater network of Ipelegeng has historically been known for regular spillages. As such the water service authority has embarked on a venture to optimise the system by implementing a bulk augmentation project. The aim of the 'Augmentation of Bulk Sewer Infrastructure in Ipelegeng' project is to optimise the wastewater system of Ipelegeng by decommissioning several pumping applications. In addition, the proposed scope of works comprises of the installation of two outfall sewer lines as well as the construction of a new oxidation ponds system. The proposed development (the estimated construction duration is 18 months) will consist of the following:

- The configuration of the existing sewer system entails that all wastewater generated in Ipelegeng gravitates to five (5) pumping stations. The current pumping system installed on site is not sufficient to convey wastewater to the Waste Water Treatment Plant (WWTP) and this results in spillages occurring due to the overloading of infrastructure (Refer to Figure 2 for the general layout plan). The motivation for the proposed project is twofold. Firstly, it will address the current capacity shortfall by reducing the inflow volume at pumping stations, and secondly, it will optimise the current sewer network to operate

more efficiently by decreasing the pumping and repumping of sewage. It is proposed that two “cut-off” gravity outfall lines is installed to reduce the load on the pumping stations and furthermore, it is proposed that an oxidation pond is constructed to decommission Pumping Station A.

- The proposed construction of the oxidation pond system will be in the vicinity of Pumping Station A. The establishment of a pond system will ensure that wastewater accumulates in the system regardless of external factors. Thus, the construction of this pond system will eradicate sewer spillages immediately. Due to the fact that the oxidation pond system does not require any electrical or mechanical equipment, the application is considered to be the most suitable cost-effective solution for the Ipelegeng sewer lines.
- The two (2) gravity outfall sewer pipelines will be used to transport the sewage to the oxidation pond. The following co-ordinates will be applicable to:

Latitude (S):

Longitude (E):

Western Sewage Pipeline

Starting point of the activity	27°	13'	02.71"	25°	17'	42.03"
Middle/Additional point of the activity	27°	12'	53.52"	25°	17'	27.58"
End point of the activity	27°	12'	41.48"	25°	17'	13.83"

Eastern Sewage Pipeline

Starting point of the activity	27°	13'	01.52"	25°	17'	44.30"
Middle/Additional point of the activity	27°	12'	49.92"	25°	17'	54.72"
End point of the activity	27°	12'	31.38"	25°	17'	43.18"

- The proposed pond system will consist of a series of Anaerobic, Aerobic, and Maturation ponds within which wastewater is continuously allowed to flow from one pond to the next until the treated effluent is ultimately discharged into an Artificial Wetland (Refer to Figure 4 for the detailed design of the Oxidation Pond). Constructed wetlands are artificial aquatic environments that are utilised to treat organic, inorganic, and excess nutrient contaminants in wastewater. These wetlands consist of hydrophytes or macrophytes plants as well as coarse media to facilitate organic filtration. It is further proposed that the ponds itself is lined with concrete to allow for cleaning and desludging. When desludging occurs the sludge will be conveyed to the existing Schweizer Reneke wastewater treatment plant, which has ample capacity to accommodate the anticipated sludge volume that is anticipated to be generated by the new proposed oxidation ponds.
- The Artificial wetland of the Ipelegeng oxidation ponds system was designed as a meandering Subsurface flow system and will be located south east of the Ipelegeng Extension 3 (Latitude: 27°13'12.58"S & Longitude 25°17'53.51"E). The projected footprint of the wetland is 1725 m². The total

length of the proposed wetland will amount to 860 meters resulting in a wetted surface area of 860 m² and a volume of 860 m³ (Refer to Figure 5 for the detailed Wetland design).

LEGISLATIVE CONTEXT

The proposed project constitutes the following listed activities of the NEMA:

Environmental Impact assessment (EIA) Regulations Listing Notice 1 (as amended) Government Notice Regulations No. (GN R.) 327 of 07 April 2017, as amended by GN R. 517 of 11 June 2021 of the National Environmental Management Act, 1998 (Act No. 107 of 1998)

LISTED ACTIVITY	DESCRIPTION OF PROJECT ACTIVITY
<p>GNR 327 as amended by GNR 517:</p> <p>Activity 19:</p> <p>“The infilling or depositing of any material of more than 10 cubic meters into, or the dredging, excavation, removal, or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic meters from a watercourse.”</p>	<p>According to the North West Biodiversity Sector plan the eastern outfall line falls within a watercourse.</p> <p>According to the Aquatic and Hydrological reports this watercourse is artificial. The applicability of this listed activity will be confirmed by the Department after the Public Participation Process.</p>
<p>GNR 327 as amended by GNR 517:</p> <p>Activity 27:</p> <p>“The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for–</p> <p>(i) the undertaking of a linear activity.”</p>	<p>The physical footprint of the proposed construction of the oxidation pond is approximately 1.56ha, thus clearance of an area of 1 hectare or more, but less than 20 hectares will occur. Excluding the two sewer outfall lines and discharge line and therefore this activity will be triggered.</p>
<p>GNR 324 as amended by GNR 517:</p> <p>Activity 12:</p> <p>“The clearance of an area of 300 square meters or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.</p> <p>North West Province</p>	<p>The physical footprint of the construction of the oxidation pond system and two gravity outfall sewer lines falls within the critical biodiversity area 2, and a vulnerable ecosystem. According to the North West Province Protected Area Expansion Implementation Strategy (2011), the status of the bushveld vegetation in Schweizer-Reneke is vulnerable. An area of 300 square meters or more of indigenous vegetation will be cleared within the critical biodiversity area 2.</p>

<p>iv) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority.</p> <p>vi) Areas within a watercourse or wetland or within 100 meters from the edge of a watercourse or wetland.”</p>	<p>The footprint of the Eastern outfall sewer line and the discharge point will also be within 100 meters of a watercourse or wetland and an area of 300 square meters or more of indigenous vegetation will be cleared.</p>
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National Heritage Resources Act, 1999 (Act No. 25 of 1999)

Section 38(1): Subject to the provision of subsections (7), (8) and (9), any person who intends to undertake a development categorised as –

- (a) the construction of a road, wall, power line, pipeline, canal, or other similar form of linear development or barrier exceeding 300 m in length.

Triggering reason: The proposed project will cover a distance of more than 300 metres.

National Water Act, 1998 (Act No. 36 of 1998)

Section 40(1):

“A person who is required or wishes to obtain a licence to use water must apply to the relevant responsible authority for a licence.”

Section 21:

“For the purpose of this Act, water use includes –

- c) impeding or diverting the flow of water in a watercourse.
- f) discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or another conduit.
- g) disposing of waste in a manner which may detrimentally impact on a water resource.
- i) altering the bed, banks, course, or characteristic of a watercourse.

Triggering reason: The proposed activity will trigger Section 21 of the NWA.

REPORT STRUCTURE

This Report is set out as follow:

- **Section A: Activity Description** provides an overview of the development proposal and listed activities which are triggered in terms Listing Notices GN R. 327 and R. 324 of the EIA Regulations of 07 April 2017 (as amended).
- **Section B: Description of Receiving Environment** provides detail on the affected landscape in its present state. A range of aspects relating to the biophysical (e.g., geology, soil surface and sub-surface water and biodiversity), socio-economic and historic and cultural character of the immediate site and surrounding areas are described herein, whilst applicable legislation, policies and guidelines considered are recognised.
- **Section C: Public Participation** describes the consultation component of this study between the EAP and Interested and Affected Parties (I&AP's) as well as Organs of States. Regulatory requirements of the process are discussed, with a summary of consultation made with state departments as well as comments and response are given. Comment periods were afforded to parties, with an initial registration period provided to parties.
- **Section D: Impact Assessment, Management, Mitigation and Monitoring Measures**, describe how the proposed project may impact on the geographical and physical, biodiversity, socio-economic and historical and cultural aspects of the receiving environment. Resource uses of the proposed project phases, attributes to waste and emissions, water use, power supply and energy efficiency are further discussed.
- **Section E: Recommendations of the EAP** provides, based on such findings as various site surveys, impact assessment, investigation of alternatives and the review of strategic policies to consider the needs and desirability, the outgoing opinion of the EAP is detailed. Any noteworthy recommendations emanating from the study are described here.
- **Section F: Appendices** list all supportive documents enclosed with this report, after which declarations of the Applicant, EAP and Specialists are given.

ALTERNATIVES

Only one Location is proposed for the proposed oxidation ponds and two gravity outfall sewer pipelines, as detailed below.

LOCATION ALTERNATIVE 1 (PREFERRED ALTERNATIVE):

The construction of an oxidation pond system and two gravity outfall sewer pipelines outside the urban area of Ipelegeng township on Portion 1 of the farm Schweizer-Reneke Town and Townlands 62 HO and Portion 21 of the farm Palachoema 64 HO, near Schweizer-Reneke, North West Province. The proposed development

footprint is primarily zoned as Agricultural with the surrounding area being zoned as residential areas. The Preferred Alternative will be situated at the following co-ordinates:

The coordinates for the two outfall sewer lines are:

- 27° 12' 55.66" S and 25° 17' 31.14" E (Eastern sewer line)
- 27° 17' 49.75" S and 25° 17' 54.74" E (Western sewer line)

The coordinate for the discharge point is:

- 27° 13' 13.44" S and 25° 17' 59.12" E

The coordinate for the artificial wetland is:

- 27° 13' 06.06" S and 25° 17' 49.96" E

The coordinates for the oxidation pond system are:

- 27° 13' 4.07" and 25° 17' 47.86" E



Figure 1: Preferred Site Alternative

DESIGN ALTERNATIVE 1 (PREFERRED ALTERNATIVE):

Following a virtual meeting with the Department of Water and Sanitation it was requested that an artificial wetland be included within the treatment train of the proposed oxidation pond system as a condition for the Water Use License. The construction of an oxidation pond system will consist of a series of Anaerobic, Aerobic, and Maturation ponds within which wastewater is continuously allowed to flow from one pond to the next until the treated effluent is ultimately discharged into an Artificial Wetland (Refer to Figure 4 for the detailed design of the Oxidation Pond). Constructed wetlands are artificial aquatic environments that are utilised to treat organic, inorganic, and excess nutrient contaminants in wastewater. These wetlands consist of hydrophytes or

macrophytes plants as well as coarse media to facilitate organic filtration. It is further proposed that the ponds itself is lined with concrete to allow for cleaning and desludging. When desludging occurs the sludge will be conveyed to the existing Schweizer Reneke wastewater treatment plant, which has ample capacity to accommodate the anticipated sludge volume that is anticipated to be generated by the new proposed oxidation ponds. The Artificial wetland of the Ipelegeng oxidation ponds system was designed as a meandering Subsurface flow system and will be located south east of the Ipelegeng Extension 3 (Latitude: 27°13'12.58"S & Longitude 25°17'53.51"E). The projected footprint of the wetland is 1725 m². The total length of the proposed wetland will amount to 860 meters resulting in a wetted surface area of 860 m² and a volume of 860 m³ (Refer to Figure 5 for the detailed Wetland design).

DESIGN ALTERNATIVE 2:

The construction of an oxidation pond system will consist of a series of Anaerobic, Aerobic, and Maturation ponds within which wastewater is continuously allowed to flow from one pond to the next until the treated effluent is ultimately discharged into the Harts River. It is further proposed that the ponds itself is lined with concrete to allow for cleaning and desludging. When desludging occurs the sludge will be conveyed to the existing Schweizer Reneke wastewater treatment plant, which has ample capacity to accommodate the anticipated sludge volume that is anticipated to be generated by the new proposed oxidation ponds.

No-Go Alternative:

The no-go alternative will result in no construction of the proposed oxidation pond and gravity outfall sewage pipeline. Dr Ruth Segomotsi Mompati District Municipality will not be able to comply with their constitutionally mandated functions if the new oxidation pond gravity outfall sewage pipelines are not constructed. Sewer spillages will also continue to pollute the environment and create a potential risk to human health.

PUBLIC PARTICIPATION PROCESS

A comprehensive **Public Participation** will be undertaken to engage stakeholders I&APs on the development proposal. I&AP's will informed of the BA Process through an advertisement in one (1) local newspaper and poster notices were erected at strategic locations. The surrounding landowners will be informed of the proposed project by means of the distribution of comment forms and the Background Information Document (BID), as well as relevant Organs of State.

The DBAR will be made available for a thirty (30) day comment period from **19 June 2023 – 19 July 2023**. The BAR will be made available on Enviroworks website (<https://enviroworks.co.za/>) and a link to the website will be sent via email to all relevant Stakeholders and Organs of State.

SPECIALIST FINDINGS

Below follows a summary of the specialist studies as per specialist reports attached to Appendix D:

HERITAGE IMPACT ASSESSMENT

A Heritage Screener was carried out for the proposal to construct an oxidation pond system and two gravity outfall sewer lines near Schweizer-Reneke, North West Province (Lavin, 2022).

In the development of the Amalia Extension 5 Township project, Pelser did not identify any archaeological sites. However, some historic farming remnants were recorded on site as well as a couple of cemeteries (Pelser, 2014, SAHRIS NID 167803). In Coetzee's (2017) Heritage Impact Assessment (HIA) for proposed diamond mining prospecting no Stone Age or Iron Age archaeological sites were found but further burial grounds and graves were recorded along with various historic homesteads. Coetzee further noted that, "Although erosion areas near the Harts River yielded no Stone Age assemblages, it is well known that Late Iron Age stone-walled settlements do not usually occur in open low-lying grasslands. The well-known Korana settlements of Chief Mossweu are located near Mamusa Hill (further west near Schweizer-Reneke) and other Tswana settlement (Rolong and Tlhaping) occur further north and west of the survey area. A total of four historical farmhouse complexes or individual houses dating to the late 19th and early 20th centuries were recorded. In addition, one historical stonewalled cattle kraal was also noted. These structures are associated with the land granted to the local farmers by Chief Mossweu in 1882. Seven graveyards and individual graves were recorded which represent farm workers and the families that settled in the area since the 1880s. If the exhumation and reburial of the graveyards are envisaged, it will entail social consultation and permit application".

Given the extremely small footprint of the sewer upgrades and the highly disturbed ground that has already been heavily impacted by urbanisation and farming, it is unlikely that any significant archaeological heritage resources will be found for this development. There are no buildings or cultural landscape elements in the proposed development area. The proposed route of the pipeline falls within an existing path around a cemetery serving the community of Ipelegeng in Schweizer-Reneke. It is clear that the proposed development may well impact on modern graves and the route and excavation work will have to be carefully done to avoid impacts on any graves, however this is not a heritage concern as these graves are modern.

The proposed sewer system upgrades fall in an area of insignificant/zero palaeontological sensitivity according to the SAHRIS Palaeosensitivity map as the geological context consists of biotite gneiss, augen gneiss, porphyritic and homogeneous granite, and pegmatite. There is therefore no need to carry out further palaeontological studies for this development.

PLANT SPECIES, ANIMAL SPECIES AND TERRESTRIAL BIODIVERSITY THEME COMPLIANCE STATEMENT

It is anticipated that the oxidation ponds and sewage outflow will have negligible impact on the biodiversity, fauna and botanical features identified by the Screening Tool as most of the footprint is disturbed and degraded and does not contribute significantly to the overall ecological functioning and biodiversity of the area. Most of the indigenous species identified on the footprint are non-threatened and non-protected. Any fauna species that utilised the area are expected to be common to the wider and non-threatened and not protected. Should any faunal species have been impacted, individuals would have likely been able to find refuge in the surrounding open space (Smith, 2023).

Taking into consideration the expected sensitivity of the footprint, sensitive features identified by the Screening Tool, the results from the expected baseline biodiversity and ecosystem of the site, which was verified by a site visit, it can be concluded that the footprint is of **low sensitivity** for the Plant Species, Animal Species and Terrestrial Biodiversity Theme. Provided that all the management outcomes are adhered to, this Compliance Statement is considered sufficient to meet the requirements for authorisation under the Plant Species, Animal Species and Terrestrial Biodiversity Theme Minimum requirements (Smith, 2023).

AQUATIC BIODIVERSITY THEME COMPLIANCE STATEMENT

The proposed development footprint is predominantly situated in a Critical Biodiverse Area 2. The CBA has been classified as being a Critical Corridor Linkage area (CBA_T8) as well as a Corridor (CBA_T7). Therefore, the primary purpose of the sensitive area is to perform the function of a Biodiversity Corridor (Smith, 2023).

Various aquatic features were identified as part of the project. These features are divided into four main types: floodplain wetland, channelled valley bottom wetland, streams, and artificial drainage lines (Smith, 2023).

Taking into consideration the sensitivity of the development footprint, sensitive features identified by the Screening Tool, the results from the baseline biodiversity and ecosystem of the site, which was verified by a site visit, it can be concluded that the proposed development footprint is of **low** sensitivity for the Aquatic Biodiversity Theme. Provided that all the management outcomes are adhered to, this Compliance Statement is considered sufficient to meet the requirements for authorisation under the Aquatic Biodiversity Theme Minimum requirements.

AGRICULTURAL COMPLIANCE STATEMENT

According to the Environmental Screening Tool, the agricultural sensitivity is classified as medium agricultural sensitivity due to the Low-Moderate to Moderate Land capability. Based on the observations made on site and analysis of the data collected, the proposed site for the development is considered as **medium** sensitivity for the following reasons (Bouwer, 2022):

- The moderate depth of the yellow brown apedal (800 mm).
- The Low-Moderate land capability calculated by the Department of Agriculture, Forestry and Fisheries, 2017.
- The absence of cultivated lands, with the primary land use being natural grassland.
- The absence of livestock and the small area (1.5 ha) which would not be able to sustain one large livestock unit.

Due to the medium sensitivity and lack of current agricultural activity, it is the specialist's opinion that the proposed development will not have a significant impact on agricultural in the area. In terms of agricultural sensitivity, the proposed development should thus be allowed to proceed at the identified site (Bouwer, 2022).

GEOHYDROLOGICAL IMPACT ASSESSMENT

A Geohydrological Impact Assessment was carried out for the proposal to construct an oxidation pond system and two gravity outfall sewer lines near Schweizer-Reneke, North West Province.

Taking all the different aspects and their limitations that were investigated during the Geohydrological Impact Assessment into account the following conclusions can be made (Lubbe, 2022):

- In case of overflow or spillage from the proposed oxidation pond, the effluent from the facility can flow to the topographical depression, which is the Harts River.
- The predicted impact of the facility on groundwater can be that the aquifer present is a minor weathered, fractured aquifer (increases the permeability of the aquifer) which indicate that the potential for the aquifer to become contaminated is high, however the infiltration potential of the contaminant to the groundwater table is low. Thus, the overall predicted impact on the groundwater quality with regards to site specific conditions, are low if the mitigation measures and recommendations are implemented. It is of uttermost importance that all activities associated with waste, i.e., oxidation pond, sludge dry beds, etc., should be lined with impermeable surfaces due to the nature of the highly permeable groundwater aquifer. It should be ensured that the sewage lines are constructed to ensure that leakage does not occur.

The proposed oxidation pond system and two (2) gravity outfall sewer lines, poses an overall low risk in terms of groundwater contamination potential and a high risk in surface water contamination potential; however, risks can be decreased by taking the above-mentioned recommendations and mitigation measures mentioned in the report into account (Lubbe, 2022).

BASIC ASSESSMENT REPORT CONTENT REQUIREMENTS

Table 1: Requirements of a Basic Assessment Report.

Content Requirements of a Basic Assessment Process	Section in the Report
(a) details of – (i) the EAP who prepared the report, and (ii) the expertise of the EAP, including a curriculum vitae;	Appendix H
(b) the location of the activity, including: (i) the 21-digit Surveyor General code of each cadastral land parcel; (ii) where available, the physical address and farm name. (iii) where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties;	Section B
(c) a plan which locates the proposed activity or activities applied for as well as associated structures and infrastructure at an appropriate scale;	Appendix A
(d) a description of the scope of the proposed activity, including – (i) all listed and specified activities triggered and being applied for; and (ii) a description of the activities to be undertaken including associated structures and infrastructure;	Section A
(e) a description of the policy and legislative context within which the development is proposed including – (i) an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks, and instruments that are applicable to this activity and have been considered in the preparation of the report; and (ii) how the proposed activity complies with and responds to the legislation and policy context, plans, guidelines, tools framework, and instruments;	Section A
(f) a motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location;	Section A
(g) a motivation for the preferred site, activity, and technology alternative;	Section A
(h) a full description of the process followed to reach the proposed preferred alternative within the site, including: (i) details of all the alternatives considered. (ii) details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs. (iii) a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them. (iv) the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects. (v) the impacts and risks identified for each alternative, including the nature, significance, consequence, extent, duration, and probability of the impacts, including the degree to which these impacts – (aa) can be reversed. (bb) may cause irreplaceable loss of resources; and (cc) can be avoided, managed, or mitigated. (vi) the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risk associated with the alternatives.	Section A

Content Requirements of a Basic Assessment Process	Section in the Report
<p>(vii) positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects.</p> <p>(viii) the possible mitigation measures that could be applied and level of residual risk.</p> <p>(ix) the outcome of the site selection matrix.</p> <p>(x) if no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such; and</p> <p>(xi) a concluding statement indicating the preferred alternatives, including preferred location of the activity;</p>	
<p>(i) a full description of the process undertaken to identify, assess and rank the impacts the activity will impose on the preferred location through the life of the activity, including –</p> <p>(i) a description of all environmental issues and risk that were identified during the environmental impact assessment process; and</p> <p>(ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures;</p>	Appendix F
<p>(j) an assessment of each identified potentially significant impact and risk, including-</p> <p>(i) cumulative impacts.</p> <p>(ii) the nature, significance and consequences of the impact and risk;</p> <p>(iii) the extent and duration of the impacts and risk occurring.</p> <p>(iv) the probability of the impact and risk occurring.</p> <p>(v) the degree to which the impact and risk can be reversed.</p> <p>(vi) the degree to which the impact and risk may cause irreplaceable loss of resources; and</p> <p>(vii) the degree to which the impact and risk can be avoided, managed, or mitigated;</p>	Appendix F
<p>(k) where applicable, a summary of the findings and impact management measures identified in any specialist report complying with Appendix 6 to these Regulation and an indication as to how these findings and recommendations have been included in the final report;</p>	Section D
<p>(l) an environmental impact statement which contains –</p> <p>(i) a summary of the key findings of the environmental impact assessment.</p> <p>(ii) a map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the proposed site indicating any areas that should be avoided, including buffers; and</p> <p>(iii) a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;</p>	Section D
<p>(m) based on the assessment, and where applicable, impact management measures from specialist reports, the recording of the proposed impact management objectives, and the impact management outcomes for the development for inclusion in the EMP'r;</p>	Appendix G
<p>(n) any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation;</p>	Section E
<p>(o) a description of any assumptions, uncertainties, and gaps in knowledge which relate to the assessment and mitigation measures proposed;</p>	Section D

Content Requirements of a Basic Assessment Process	Section in the Report
(p) a reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation;	Section E
(q) where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required, the date on which the activity will be concluded, and the post construction monitoring requirements finalised;	N/A
(r) an undertaking under oath or affirmation by the EAP in relation to: <ul style="list-style-type: none"> (i) the correctness of the information provided in the reports. (ii) the inclusion of comments and inputs from stakeholders and I&APs. (iii) the inclusion of inputs and recommendations from the specialist reports where relevant; and (iv) any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties; and 	Section E
(s) where applicable, details of any financial provision for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts;	N/A
(t) any specific information that may be required by the competent authority; and	Appendix J
(u) any other matters required in terms of section 24(4)(a) and (b) of the Act.	N/A

DETAILS OF THE EAP

EAP DETAILS

Table 2: Details of the EAP

Business name of Specialist:	Enviroworks
Specialist Name:	Edmari Lewis
Physical address:	96 Merriman Street, George, 6529
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Education qualifications	B.Sc. Honours Environmental Science with Geography and Environmental Management (NWU)
Professional affiliations	Candidate SACNASP (147171) Candidate EAPASA (2021/3452)

EAP CURRICULUM VITAE



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Edmari Lewis

RELEVANT QUALIFICATIONS

Baccalaureus Scientiae (B.Sc.) in Environmental and Biological Sciences: North-West University (2018)
Baccalaureus Scientiae (B.Sc) Honours in Geography and Environmental Management: North-West University (2019)

WORK EXPERIENCE

June 2019 - July 2022: Environmental Consultant at Core Environmental Services (Mbombela)

August 2022 – current: Environmental Consultant at Enviroworks (George)

ENVIRONMENTAL IMPACT ASSESSMENT EXPERIENCE

- Manufacturing of precast concrete hollow core slabs, Mbombela, Mpumalanga Province, NORSE Projects (Pty) Ltd
- The proposed citrus plantation on portion 5 of the farm Duma 201-JU, Mbombela, Mpumalanga Province, AEONIK FARMS SEQUOIA (Pty) Ltd
- The expansion and operation of poultry facilities, Mbombela, Mpumalanga Province, Matumaini Farming
- The proposed Middelburg Dam Precinct Plan, Middelburg, Mpumalanga Province,
- Proposed Sebaka Cellular Mast, Mpumalanga Province, Thabure Towerco
- Proposed Rooibektiptol Cellular Mast, Mpumalanga Province, Thabure Towerco
- Proposed Doornkop Cellular Mast, Mpumalanga Province, Thabure Towerco
- The proposed increase in slaughtering capacity for the Barberton Abattoir, Barberton, Mpumalanga Province,
- The proposed clearance of 19 hectares of indigenous vegetation for agricultural purposes on portion 74 of the farm Abek 6-JU, Hazyview, Mpumalanga Province, Shekinah Glory Boerdery
- Proposed clearance of 18.5 hectares of indigenous vegetation for agricultural purposes on portion 1 and 5 of the farm Mooifontein 292-JU, Schoemanskloof, Mpumalanga Province, Poplar Creek

- Proposed clearance of 13 hectares of indigenous vegetation on portion 15 of the farm Sandford 291-JU, Hazyview, Mpumalanga Province, Sandford Agri (Pty) Ltd.
- Desilting of two dams on portion 1 of the farm Hull 92-KU, Klaserie Private Nature Reserve, Hoedspruit, Limpopo Province, Gladys Group
- Section 24G application for the unlawful clearing of indigenous vegetation, Mbombela, Mpumalanga Province, Wolmac Boerdery
- Section 24G application for the unlawful clearing of indigenous vegetation, Hazyview, Mpumalanga Province, Sandford Agri (Pty) Ltd
- Section 24G application for the unlawful clearing of indigenous vegetation, Mbombela, Mpumalanga Province, Ibhubesi Macs (Pty) Ltd

Scoping and Environmental Impact Assessment

- Scoping and Environmental Impact Assessment for the proposed Malalane Bypass Ring Road, Malalane, Mpumalanga Province, SANRAL
- Scoping and Environmental Impact Assessment for the clearance of 2000 hectares of indigenous vegetation for agricultural purposes, Nkomazi Game Reserve

BASIC ASSESSMENT EXPERIENCE

- The proposed citrus plantation on portion 5 of the farm Duma 201-JU, Mbombela, Mpumalanga Province, AEONIK FARMS SEQUOIA (Pty) Ltd
- The expansion and operation of poultry facilities, Mbombela, Mpumalanga Province, Matumaini Farming
- The proposed Middelburg Dam Precinct Plan, Middelburg, Mpumalanga Province,
- Proposed Sebaka Cellular Mast, Mpumalanga Province, Thabure Towerco
- Proposed Rooibektiptol Cellular Mast, Mpumalanga Province, Thabure Towerco
- Proposed Doornkop Cellular Mast, Mpumalanga Province, Thabure Towerco
- The proposed increase in slaughtering capacity for the Barberton Abattoir, Barberton, Mpumalanga Province,
- The proposed clearance of 19 hectares of indigenous vegetation for agricultural purposes on portion 74 of the farm Abek 6-JU, Hazyview, Mpumalanga Province, Shekinah Glory Boerdery
- Proposed clearance of 18.5 hectares of indigenous vegetation for agricultural purposes on portion 1 and 5 of the farm Mooifontein 292-JU, Schoemanskloof, Mpumalanga Province, Poplar Creek
- Proposed clearance of 13 hectares of indigenous vegetation on portion 15 of the farm Sandford 291-JU, Hazyview, Mpumalanga Province, Sandford Agri (Pty) Ltd.
- Desilting of two dams on portion 1 of the farm Hull 92-KU, Klaserie Private Nature Reserve, Hoedspruit, Limpopo Province, Gladys Group

WATER USE APPLICATION

- General Authorisation for the abstraction of surface and ground water for the purpose of bottling, Malalane, Mpumalanga Province, Vorn Water (Pty) Ltd.
- General Authorisation for the Crossings Channel Modification, Mbombela, Mpumalanga Province
- General Authorisation for the abstraction of groundwater for domestic use and CCA wood treatment
- General Authorisation for the proposed desilting of two dams located within Klaserie Private Nature Reserve, Hoedspruit, Limpopo Province

Section 24G Rectification Application

- Section 24G application for the unlawful clearing of indigenous vegetation, Mbombela, Mpumalanga Province, Wolmac Boerdery
- Section 24G application for the unlawful clearing of indigenous vegetation, Hazyview, Mpumalanga Province, Sandford Agri (Pty) Ltd
- Section 24G application for the unlawful clearing of indigenous vegetation, Mbombela, Mpumalanga Province, Ibhubesi Macs (Pty) Ltd

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ACRONYMS AND ABBREVIATIONS

BA	–	Basic Assessment
BAR	–	Basic Assessment Report
CBA	–	Critical Biodiversity Area
DEDECT	–	Department Economic Development, Environment, Conservation, Tourism
EAP	–	Environmental Assessment Practitioner
ECO	–	Environmental Compliance Officer
EIA	–	Environmental Impact Assessment
EIE	-	Environmental Orientation and Education
EMF	–	Environmental Management Framework
EMPr	–	Environmental Management Programme
ESA	–	Ecological Support Area
GN R	–	Government Notice Regulation
I&AP	–	Interested & Affected Party
IDP	–	Integrated Development Plan
LED	–	Local Economic Development
LM	–	Local Municipality
NDT	–	National Department of Tourism
NEM: PAA	–	National Environmental Management: Protected Areas Act
NEM: WA	–	National Environmental Management: Waste Act
NEMA	–	National Environmental Management Act
NHRA	–	National Heritage Resources Agency
NPA	–	National Parks Act
NWA	–	National Water Act
PSDF	–	Provincial Spatial Development Framework
SAHRA	–	South African Heritage Resources Agency
SAPS	-	South African Police Service
SDF	–	Spatial Development Framework

1 SECTION A: ACTIVITY INFORMATION

1.1 PROJECT DESCRIPTION

Moedi Consulting Engineers on behalf of the Dr. Ruth Segomotsi Mompati District Municipality appointed Enviroworks, an independent Environmental Consultant, for the proposed construction of an oxidation pond system and two gravity outfall sewer pipelines outside the urban area of Ipelegeng township on Portion 1 of the farm Schweizer-Reneke Town and Townlands 62 HO and Portion 21 of the farm Palachoema 64 HO, near Schweizer-Reneke, North West Province (Refer to Figure 1 for the locality map).

The wastewater network of Ipelegeng has historically been known for regular spillages. As such the water service authority has embarked on a venture to optimise the system by implementing a bulk augmentation project. The aim of the 'Augmentation of Bulk Sewer Infrastructure in Ipelegeng' project is to optimise the wastewater system of Ipelegeng by decommissioning several pumping applications. In addition, the proposed scope of works comprises of the installation of two outfall sewer lines as well as the construction of a new oxidation ponds system. The proposed development (the estimated construction duration is 18 months) will consist of the following:

- The configuration of the existing sewer system entails that all wastewater generated in Ipelegeng gravitates to five (5) pumping stations. The current pumping system installed on site is not sufficient to convey wastewater to the Waste Water Treatment Plant (WWTP) and this results in spillages occurring due to the overloading of infrastructure (Refer to Figure 2 for the general layout plan). The motivation for the proposed project is twofold. Firstly, it will address the current capacity shortfall by reducing the inflow volume at pumping stations, and secondly, it will optimise the current sewer network to operate more efficiently by decreasing the pumping and repumping of sewage. It is proposed that two "cut-off" gravity outfall lines are installed to reduce the load on the pumping stations and furthermore, it is proposed that an oxidation pond are constructed to decommission Pumping Station A.
- The proposed construction of the oxidation pond system will be in the vicinity of Pumping Station A. The establishment of a pond system will ensure that wastewater accumulates in the system regardless of external factors. Thus, the construction of this pond system will eradicate sewer spillages immediately. Due to the fact that the oxidation pond system does not require any electrical or mechanical equipment, the application is considered to be the most suitable cost-effective solution for the Ipelegeng sewer lines.
- The two (2) gravity outfall sewer pipelines will be used to transport the sewage to the oxidation pond. The following co-ordinates will be applicable to:

Latitude (S):

Longitude (E):

Western Sewage Pipeline

Starting point of the activity	27°	13'	02.71"	25°	17'	42.03"
--------------------------------	-----	-----	--------	-----	-----	--------

Middle/Additional point of the activity	27°	12'	53.52"	25°	17'	27.58"
End point of the activity	27°	12'	41.48"	25°	17'	13.83"

Eastern Sewage Pipeline

Starting point of the activity	27°	13'	01.52"	25°	17'	44.30"
Middle/Additional point of the activity	27°	12'	49.92"	25°	17'	54.72"
End point of the activity	27°	12'	31.38"	25°	17'	43.18"

- The design criteria of the two pipelines is as follows:

Western Outfall Sewer (Pipeline from P/s – A)

Length: 1 278m

Diameter: 343 mm (75 D Concrete pipe)

Flow: 35 l/s

Eastern Outfall Sewer (Pipeline from P/s – D)

Length: 1 251m

Diameter: 272 mm (75 D Concrete pipe)

Flow: 21 l/s

The projected volumetric daily throughput capacity will be 1 800 m³ / day

- The proposed pond system will consist of a series of Anaerobic, Aerobic, and Maturation ponds within which wastewater is continuously allowed to flow from one pond to the next until the treated effluent is ultimately discharged into an Artificial Wetland (Refer to Figure 4 for the detailed design of the Oxidation Pond). Constructed wetlands are artificial aquatic environments that are utilised to treat organic, inorganic, and excess nutrient contaminants in wastewater. These wetlands consist of hydrophytes or macrophytes plants as well as coarse media to facilitate organic filtration. It is further proposed that the ponds itself is lined with concrete to allow for cleaning and desludging. When desludging occurs the sludge will be conveyed to the existing Schweizer Reneke waste water treatment plant, which has ample capacity to accommodate the anticipated sludge volume that is anticipated to be generated by the new proposed oxidation ponds.
- The Artificial wetland of the Ipelegeng oxidation ponds system was designed as a meandering Subsurface flow system and will be located south east of the Ipelegeng Extension 3 (Latitude: 27°13'12.58"S & Longitude 25°17'53.51"E). The projected footprint of the wetland is 1725 m². The total length of the proposed wetland will amount to 860 meters resulting in a wetted surface area of 860 m² and a volume of 860 m³ (Refer to Figure 5 for the detailed Wetland design).
- Treated wastewater will be discharged into the Harts River (Latitude: 27°13'13.44"S & Longitude 25°17'59.12"E). The total length of the discharge pipeline will be 338 m.

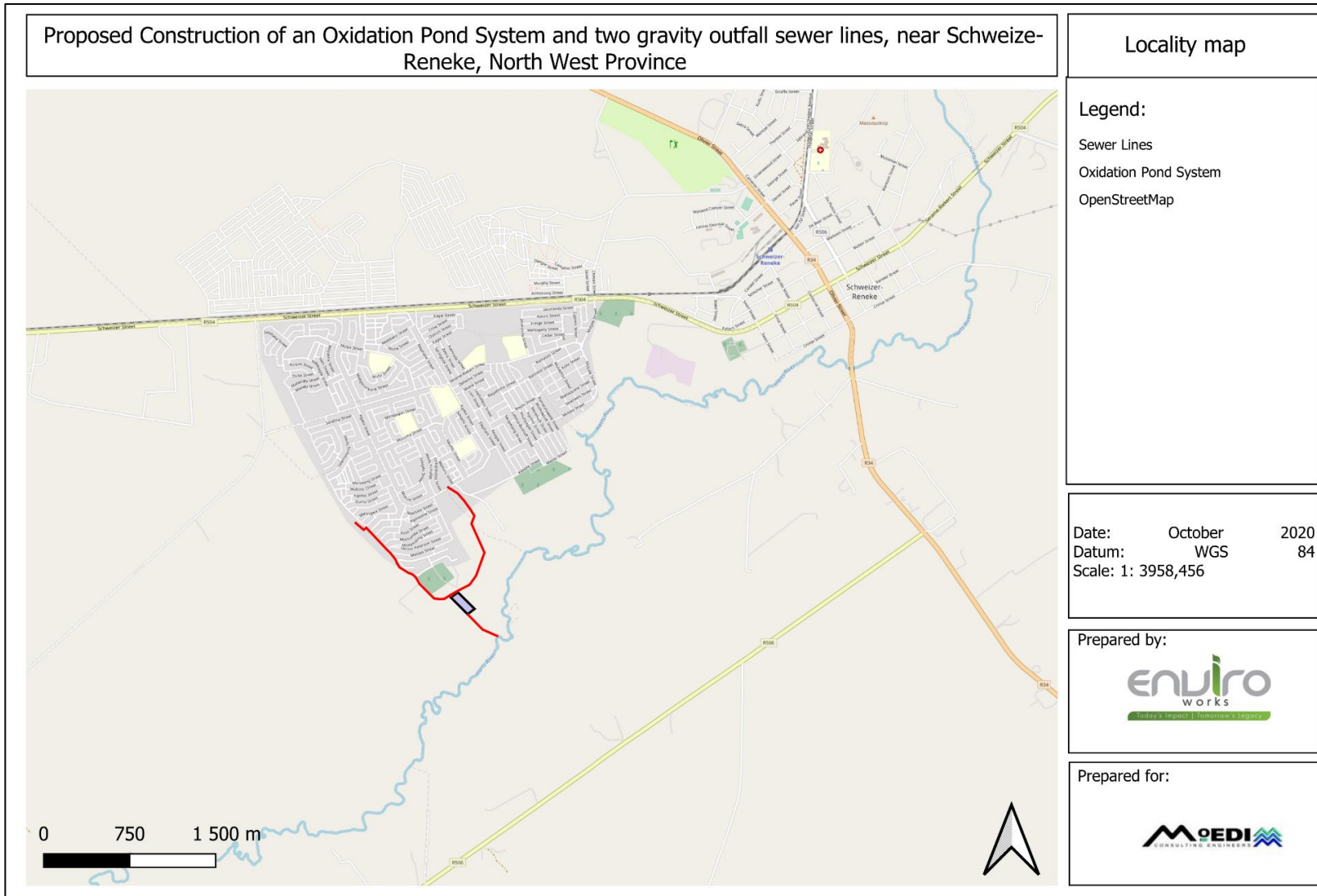


Figure 2: Locality Map of the proposed Sewer lines and Oxidation Pond System, Ipelegeng, North West Province



NOTES

NO.	DATE	BY	DESCRIPTION

MEDI CONSULTING ENGINEERS
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 45 Gaborone Street, Gaborone 00257
 Tel: +266 71 4226263 / 4226264
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Project: The Water Office Park, Phase 2, 379 Mankwato
 City: Gaborone Botswana
 Client: Botswana Water Services Corporation
 Contact: Mmedi@medi-engineers.com

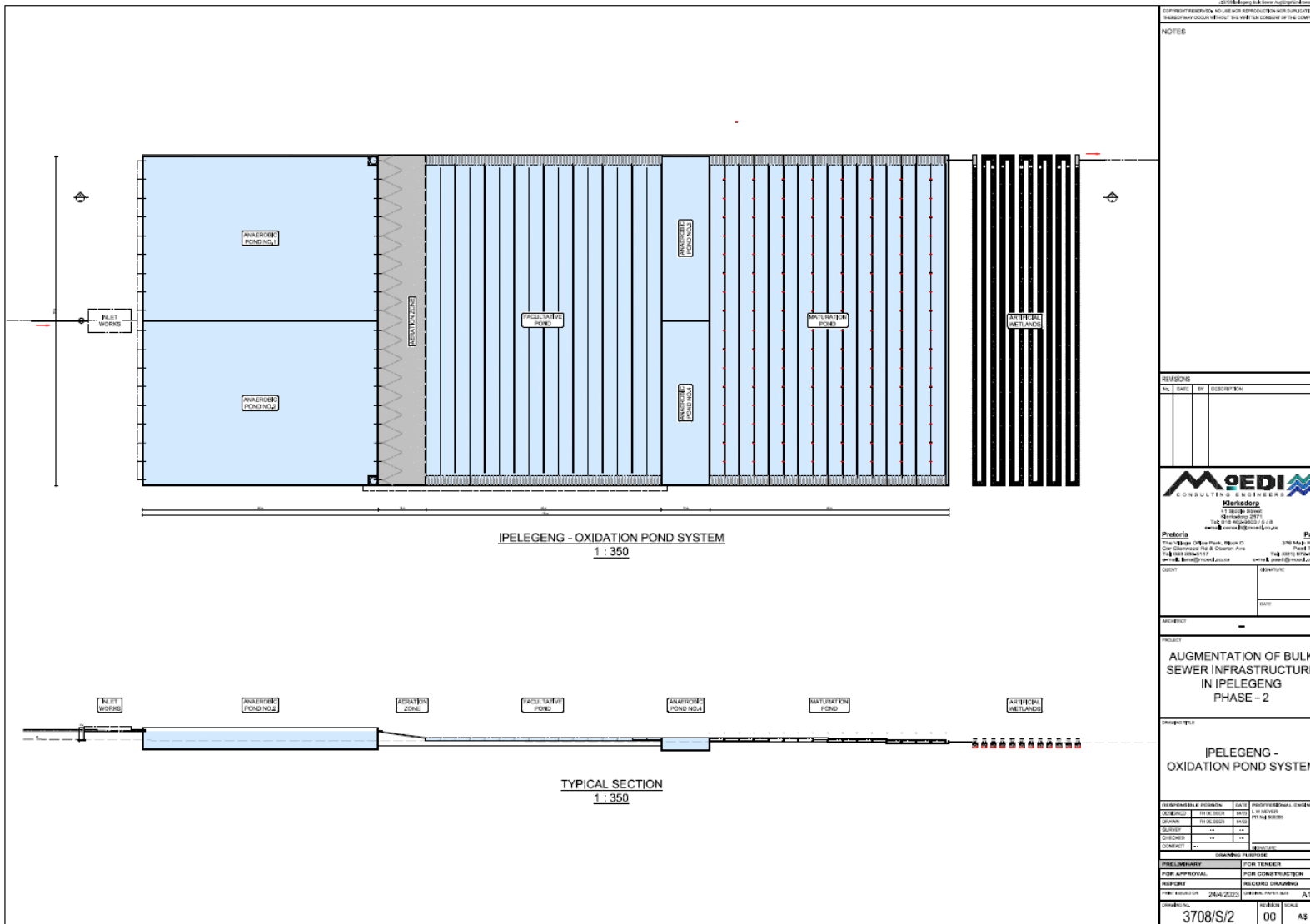
Project: AUGMENTATION OF BULK SEWER INFRASTRUCTURE IN IPELEGENG PHASE - 2

Client: GENERAL LAYOUT AND LOCALITY PLAN

REVISION NO.	REVISION	DATE	PROFESSIONAL ENGINEER
01	ISSUED FOR PERMIT	24/06/2023	
02	FOR APPROVAL		
03	FOR CONSTRUCTION		

DATE: 24/06/2023
 DRAWING NO: 3708 / C / 1
 SCALE: AS SHOWN

Figure 3: Layout Map of the proposed Sewer lines and Oxidation Pond System, Ipelegeng, North West Province



COMPANY INFORMATION: ALL INFORMATION CONTAINED HEREIN IS UNCLASSIFIED UNLESS INDICATED OTHERWISE. IMPACT MAY OCCUR IF NOT THE INTENT OF THE COMPANY.

NOTES

NO.	DATE	BY	DESCRIPTION

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CLIENT: IDENTIFICATION: DATE: PROJECT: PROJECT TITLE: PROJECT NO.:

AUGMENTATION OF BULK SEWER INFRASTRUCTURE IN IPELEGENG PHASE - 2

IPELEGENG - OXIDATION POND SYSTEM

APPROVED BY / POSITION	DATE	PROJECT / ORIGINAL ENGINEER
DESIGNED	19/12/2022	U. W. DE VRIES
DRAWN	19/12/2022	U. W. DE VRIES
CHECKED	--	--
APPROVED	--	--

CONTRACT NO. DRAWING NUMBER

PRELIMINARY FOR TENDER

FOR APPROVAL FOR CONSTRUCTION

REVISION REVISION DRAWINGS

PRINTED ON: 24/04/2023 SHEET NO. 00 SCALE: A1

CONTRACT NO. 3708/S/2 SHEET NO. 00 SCALE AS

Figure 4: Detailed design of the Oxidation Pond System, Ipelegeng, North West Province

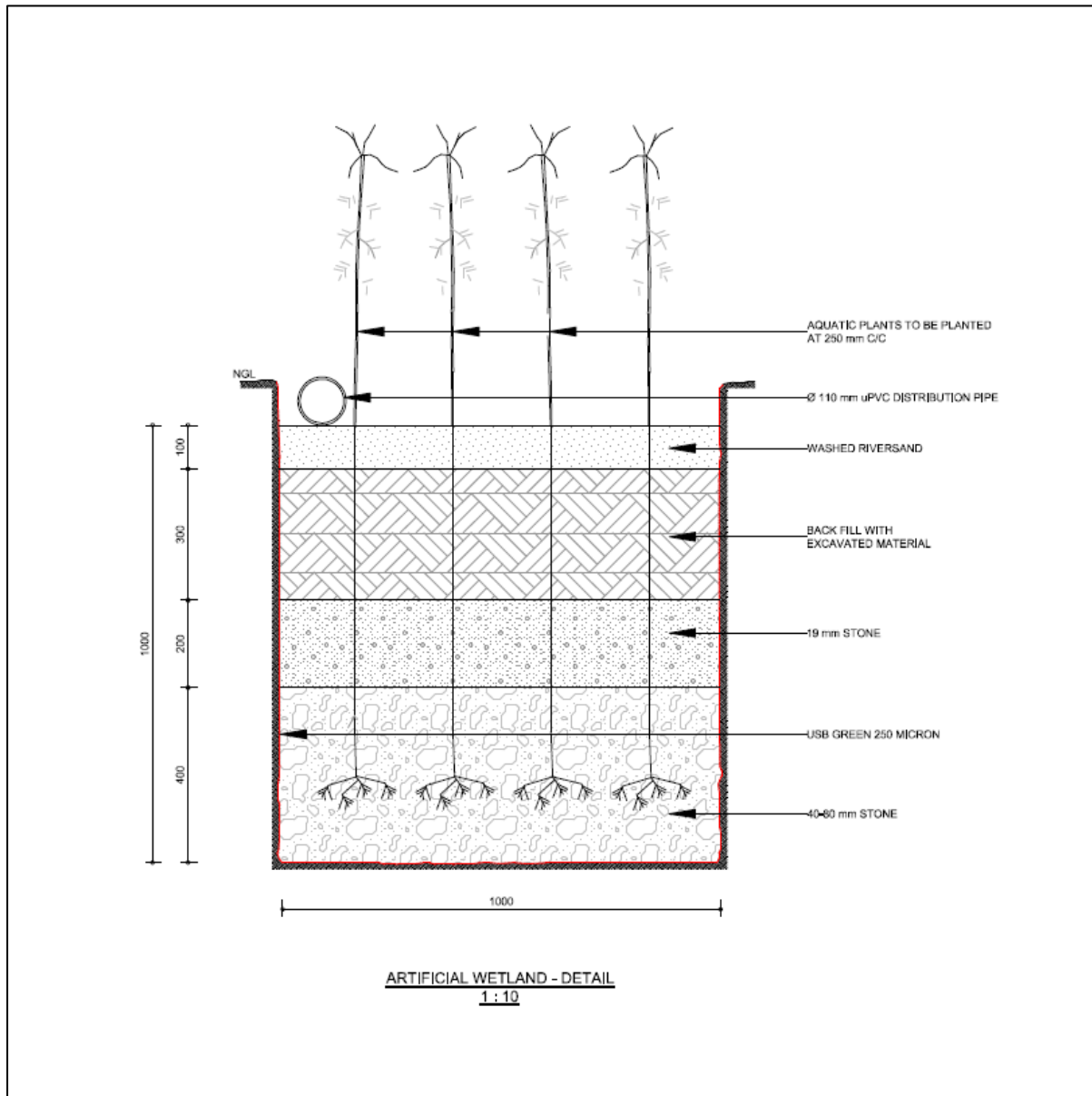


Figure 5: Detailed design of the artificial wetland

1.2 LISTED ACTIVITIES, POLICIES AND GUIDELINES ASSOCIATED WITH THE PROJECT

1.2.1 LISTED ACTIVITIES

Table 3: Triggered Listed Activities.

LISTED ACTIVITY	DESCRIPTION OF PROJECT ACTIVITY
<p>GNR 327 as amended by GNR 517:</p> <p>Activity 19:</p> <p>“The infilling or depositing of any material of more than 10 cubic meters into, or the dredging, excavation, removal, or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic meters from a watercourse.”</p>	<p>According to the North West Biodiversity Sector plan the eastern outfall line falls within a watercourse.</p> <p>According to the Aquatic and Hydrological reports this watercourse is artificial. The applicability of this listed activity will be confirmed by the Department after the Public Participation Process.</p>
<p>GNR 327 as amended by GNR 517:</p> <p>Activity 27:</p> <p>“The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for—</p> <p>(i) the undertaking of a linear activity.”</p>	<p>The physical footprint of the proposed construction of the oxidation pond is approximately 1.56ha, thus clearance of an area of 1 hectare or more, but less than 20 hectares will occur. Excluding the two sewer outfall lines and discharge line and therefore this activity will be triggered.</p>
<p>GNR 324 as amended by GNR 517:</p> <p>Activity 12:</p> <p>“The clearance of an area of 300 square meters or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.</p> <p>North West Province</p> <p>iv) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority.</p> <p>vi) Areas within a watercourse or wetland or within 100 meters from the edge of a watercourse or wetland.”</p>	<p>The physical footprint of the construction of the oxidation pond system and two gravity outfall sewer lines falls within the critical biodiversity area 2, and a vulnerable ecosystem. According to the North West Province Protected Area Expansion Implementation Strategy (2011), the status of the bushveld vegetation in Schweizer-Reneke is vulnerable. An area of 300 square meters or more of indigenous vegetation will be cleared within the critical biodiversity area 2.</p> <p>The footprint of the Eastern outfall sewer line and the discharge point will also be within 100 meters of a watercourse or wetland and an area of 300 square meters or more of indigenous vegetation will be cleared.</p>

1.3 FEASIBLE AND REASONABLE ALTERNATIVES

1.3.1 SITE ALTERNATIVES

Only one Location is proposed for the proposed oxidation ponds and two gravity outfall sewer pipelines, as detailed below.

1.3.1.1 LOCATION ALTERNATIVE 1 (PREFERRED ALTERNATIVE):

The construction of an oxidation pond system and two gravity outfall sewer pipelines outside the urban area of Ipelegeng township on Portion 1 of the farm Schweizer-Reneke Town and Townlands 62 HO and Portion 21 of the farm Palachoema 64 HO, near Schweizer-Reneke, North West Province. The proposed development footprint is primarily zoned as Agricultural with the surrounding area being zoned as residential areas. The Preferred Alternative will be situated at the following co-ordinates:

The coordinates for the two outfall sewer lines are:

- 27° 12' 55.66" S and 25° 17' 31.14" E (Eastern sewer line)
- 27° 17' 49.75" S and 25° 17' 54.74" E (Western sewer line)

The coordinate for the discharge point is:

- 27° 13' 13.44" S and 25° 17' 59.12" E

The coordinate for the artificial wetland is:

- 27° 13' 06.06" S and 25° 17' 49.96" E

The coordinates for the oxidation pond system are:

- 27° 13' 4.07" and 25° 17' 47.86" E



Figure 6: Preferred Site Alternative.

1.3.2 DESIGN ALTERNATIVE 1 (PREFERRED ALTERNATIVE)

The construction of an oxidation pond system will consist of a series of Anaerobic, Aerobic, and Maturation ponds within which wastewater is continuously allowed to flow from one pond to the next until the treated effluent is ultimately discharged into an Artificial Wetland (Refer to Figure 4 for the detailed design of the Oxidation Pond). Constructed wetlands are artificial aquatic environments that are utilised to treat organic, inorganic, and excess nutrient contaminants in wastewater. These wetlands consist of hydrophytes or macrophytes plants as well as coarse media to facilitate organic filtration. It is further proposed that the ponds itself is lined with concrete to allow for cleaning and desludging. When desludging occurs the sludge will be conveyed to the existing Schweizer Reneke wastewater treatment plant, which has ample capacity to accommodate the anticipated sludge volume that is anticipated to be generated by the new proposed oxidation ponds. The Artificial wetland of the Ipelegeng oxidation ponds system was designed as a meandering Subsurface flow system and will be located south east of the Ipelegeng Extension 3 (Latitude: 27°13'12.58"S & Longitude 25°17'53.51"E). The projected footprint of the wetland is 1725 m². The total length of the proposed wetland will amount to 860 meters resulting in a wetted surface area of 860 m² and a volume of 860 m³ (Refer to Figure 5 for the detailed Wetland design).

1.3.2.2 DESIGN ALTERNATIVE 2

The construction of an oxidation pond system will consist of a series of Anaerobic, Aerobic, and Maturation ponds within which wastewater is continuously allowed to flow from one pond to the next until the treated effluent is ultimately discharged into the Harts River. It is further proposed that the ponds itself is lined with concrete to allow for cleaning and desludging. When desludging occurs the sludge will be conveyed to the existing Schweizer Reneke wastewater treatment plant, which has ample capacity to accommodate the anticipated sludge volume that is anticipated to be generated by the new proposed oxidation ponds.

1.3.3 NO-GO ALTERNATIVE

The no-go alternative will result in no construction of the proposed oxidation pond and two gravity outfall sewer pipelines. Dr. Ruth Segomotsi Mompati District Municipality will not be able to comply with their constitutionally mandated functions if the new sewage pipeline and WWTW are not constructed.

1.4 ACTIVITY MOTIVATION

In semi-arid South Africa, water is extremely scarce and most rural and suburban communities do not have access to residential waterborne sanitation systems. Furthermore, the worsening state of municipal wastewater treatment plants has led to numerous problems in terms of drinking water contamination by wastewater outfalls, and this continues to result in regular outbreaks of waterborne diseases such as cholera and typhoid fever. South Africa is in urgent need of new wastewater treatment plants, upgrades of existing installations and proper training of municipal technical and operating staff manning these wastewater treatment plants (http://www.globenet.ca/market_reports/index.cfm?ID_Report=918).

The motivation for the proposed project is twofold. Firstly, it will address the current capacity shortfall by reducing the inflow volume at pumping stations, and secondly, it will optimise the current sewer network to operate more efficiently by decreasing the pumping and repumping of sewage. It is proposed that two “cut-off” gravity outfall lines is installed to reduce the load on the pumping stations and furthermore, it is proposed that an oxidation pond are constructed to decommission Pumping Station A.

1.4.1 INTEGRATED DEVELOPMENT PLAN AND SPATIAL DEVELOPMENT PLAN

According to the Dr. Ruth Segomotsi Mompati District Municipality’s (DRRSM) Integrated Development Plan (IDP) the existing level of development and challenges within the District Municipality can be summarized as follows:

- DRRSM is endowed with minerals, but this sector remains a small contributor to GDP of the Province.
- Population is largely African with low education, low incomes, high unemployment and with minimal access to water and sanitation.
- The large African population is largely young with a small percentage of adults who are economically active.
- Contamination of underground water sources.
- Heavy dependency on public administration as an employer. There is a critical need to develop the private sector in agriculture and mining. The development of the Small Medium Micro Enterprise (SMME) sector both in the formal and informal sectors is critical.
- Current access to water and sanitation services is a concern.
- Maintenance of Ventilated Improved Pit (VIP) toilets

The Municipality is largely rural, and the majority of population stays in rural areas.

The Dr Ruth Segomotsi Mompati District Municipality IDP’s key performance area based on Basic Service Delivery and Infrastructure Development’s strategic objective states that all citizens have a right to an

environment that is not harmful to human health, and it imposes a duty on the State to provide community services that are accessible to the communities of DRRSM in an efficient and effective manner.

Section 24 of the Republic of South Africa Constitution Act (Act No. 108 of 1996) states that; everyone has the right to an environment that is not harmful to their health and well-being and to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures.

Section 84(1)(e) of the local Government Municipal Structures Act (Act No. 117 of 1998) (hereafter referred to as the Structures Act) states that the district municipal has the following function: Solid waste disposal sites serving the area of the District municipality as a whole. Furthermore, Schedule 4 of the Constitution outlines the Local functions for which solid waste management is not included.

During 2009 the DR RSMDM Council in terms of Council Resolution No. 2009/29 accepted the responsibility of solid waste management services for the Local municipalities of Mamusa, KagisanoMolopo, Greater Taung and Lekwa-Teemane which were the municipalities that did not have the capacity to provide the optimum waste management services. The resultant of this is due to the Member of Executive Council of the Provincial Legislature having adjusted the powers and functions of the District Municipality in terms of Section 85 of the Structures Act whereby the local function of the solid waste management was put as a competency of the DR RSMDM with effect from 1 July 2008. This is a function of the District which is not funded amongst the services provided by the District Municipality. A formal Section 78 Assessment was conducted to determine the Municipality's capacity to deliver the function of solid waste management and the District Municipality sourced the service provider to that effect.

The District Municipality undertook a feasibility study on the performance of the function and the recommendation of the study reflected that the function be allocated back to the local municipalities where it resides, and the District took a resolution No. 149/2016 to inform the MEC to consider the recommendations of the study and to take back the solid waste services to the local municipalities.

The Local Government Municipal Structures Amendment Act 2000 provide for the amendment of Section 84 of the Principal Act by substituting for subsection (1) as follows:

A District Municipality has the following function and power:

- i. Solid waste disposal sites [serving the area of the district municipality as a whole], in so far as it relates to--- The determination of a waste disposal strategy;
- ii. The regulation of waste disposal
- iii. The establishment, operation and control of waste disposal sites, bulk waste transfer facilities and waste disposal facilities for more than one local municipality in the district.

The construction of the proposed Ipelegeng Oxidation ponds and the two (2) gravity outfall sewer lines is therefore a strategic move to improved quality of water and sanitation supply in the area.

1.4.2 SECTION 23 OF NEMA

Through the undertaking of a BA Process by a competent EAP, informed by guidelines, the consideration of impacts and alternatives (advantages and disadvantages coupled thereto) has been made. Moreover, the conducting of Public Participation and Specialist investigations form part of the process, whilst mitigation measures and the need and desirability of the proposed project were interrogated. This ensured that all provisions of the Act were considered and as such Integrated Environmental Management (IEM) were accounted for.

1.5 PRINCIPLES OF NEMA

1.5.1 SECTION 2 OF NEMA

Through the undertaking of a BA Process by a competent EAP, informed by guidelines, the consideration of impacts and alternatives (advantages and disadvantages coupled thereto) has been made. Moreover, the conducting of a Public Participation Process (PPP) and Specialist Investigations formed part of this BA Process, whilst mitigation measures and the needs and desirability of the proposed project were interrogated. This ensured that all provisions of the Act were considered and as such IEM were accounted for as follow:

(2) Environmental Management must place people and their needs at the forefront of its concern, and serve their physical, psychological, developmental, cultural heritage and social interests equitably.

The goal of this BAR is to identify and mitigate potential socio-economic impacts in order to meet the terms of Section 24 of the Constitution.

(3) Development must be socially, environmentally, and economically sustainable.

The overall goal of this BAR is to predict, identify and manage potential positive and negative impacts in the socio-economic, cultural-heritage and biophysical environments in order to meet the needs of present generations without compromising the needs of future generations which will give effect to sustainable development.

(4)(a) Sustainable development requires the consideration of all relevant factors including the following:

- i. That the disturbance of ecosystems and loss of biological diversity are avoided, or, where they cannot be altogether avoided, are minimised and remedied;*
- ii. that pollution and degradation of the environment are avoided, or, where they cannot be altogether avoided, are minimised and remedied;*
- iii. that the disturbance of landscapes and sites that constitute the nation's cultural heritage is avoided, or where it cannot be altogether avoided, is minimised and remedied;*
- iv. that waste is avoided, or where it cannot be altogether avoided, minimised, and reused or recycled where possible and otherwise disposed of in a responsible manner;*

- v. *that the use and exploitation of non-renewable natural resources is responsible and equitable, and takes into account the consequences of the depletion of the resource;*
- vi. *that the development, use and exploitation of renewable resources and the ecosystems of which they are part do not exceed the level beyond which their integrity is jeopardised;*
- vii. *that a risk averse and cautious approach is applied, which takes into account the limits of current knowledge about the consequences of decisions and actions; and,*
- viii. *that negative impacts on the environment and on people's environmental rights be anticipated and prevented, and where they cannot be altogether prevented, are minimised and remedied.*

An Environmental Management Program Report (EMP'r) was compiled to mitigate and manage all activities during the planning, construction, and operational phases of the proposed Oxidation Pond and two gravity outfall sewer lines' developments. Impacts were assessed in terms of the mitigation hierarchy methodology.

(b) Environmental management must be integrated, acknowledging that all elements of the environment are linked and interrelated, and it must take into account the effects of decisions on all aspects of the environment and all people in the environment by pursuing the selection of the best practicable environmental option.

All aspects, including socio-economic, cultural-heritage and biophysical were evaluated and assessed in order to minimize potential negative impacts which will give effect to IEM, as set out in Chapter 5 of NEMA, 1998.

(c) Environmental justice must be pursued so that adverse environmental impacts shall not be distributed in such a manner as to unfairly discriminate against any person, particularly vulnerable and disadvantaged persons.

A PPP will be undertaken in terms of Section 41 of the NEMA EIA Regulations (GN R. 326), which came into effect on 07 April 2017 (as amended), in order to give effect to Section 32 of the Constitution and Section 24 of the Constitution.

(d) Equitable access to environmental resources, benefits, and services to meet basic human needs and ensure human wellbeing must be pursued and special measures may be taken to ensure access thereto by categories of persons disadvantaged by unfair discrimination.

This will be taken into account during the operational phase of the activity.

(e) Responsibility for the environmental health and safety consequences of a policy, programme, project, product, process, service, or activity exists throughout its life cycle.

The EMP'r will be applicable throughout the lifecycle of the project as it will form part of the Environmental Authorisation (EA).

(f) The participation of all Interested and Affected Parties in environmental governance must be promoted, and all people must have the opportunity to develop the understanding, skills, and capacity necessary

for achieving equitable and effective participation, and participation by vulnerable and disadvantaged persons must be ensured.

A PPP will be undertaken in terms of Section 41 of the NEMA EIA Regulations (GN R. 326), which came into effect on 07 April 2017 (as amended), in order to give effect to Section 32 of the Constitution in such a way that adherence is given to Section 24 of the Constitution.

(g) Decisions must take into account the interests, needs and values of all Interested and Affected Parties, and this includes recognising all forms of knowledge, including traditional and ordinary knowledge.

The DEDECT decision making process has to be in accordance with the above.

(h) Community wellbeing and empowerment must be promoted through environmental education, the raising of environmental awareness, the sharing of knowledge and experience and other appropriate means.

Where feasible, efforts should be made to employ Local Contractors that are compliant with Broad Based Black Economic Empowerment (BBBEE) criteria; and,

Bedding materials (e.g., sand) should be sourced locally from a mining site whose owner has a valid mining permit issued by the Department of Mineral Resources (DMR).

Environmental awareness and induction training to employees during construction and operation.

(i) The social, economic, and environmental impacts of activities, including disadvantages and benefits, must be considered, assessed, and evaluated, and decisions must be appropriate in the light of such consideration and assessment.

This BAR does give effect to Section 5 of NEMA whereby all social, economic, and environmental impacts of activities were considered, assessed, evaluated, and mitigated.

(j) The right of workers to refuse work that is harmful to human health or the environment and to be informed of dangers must be respected and protected.

Human rights will be considered during all phases of the proposed project.

(k) Decisions must be taken in an open and transparent manner, and access to information must be provided in accordance with the law.

The decision will take place in an open and fair manner and give effect to Section 32 of the Constitution. I&AP's will be notified of the decision in terms of the requirements as set out in Section 41 of the NEMA EIA Regulations (GN R. 326), 2017 (as amended).

(l) There must be intergovernmental coordination and harmonisation of policies, legislation and actions relating to the environment.

All Governmental Authorities and Organs of State will be considered during the EIA process to provide their inputs on the project.

(m) Actual or potential conflicts of interest between Organs of State should be resolved through conflict resolution procedures.

Actual or potential conflicts of interest between organs of state should/will be resolved through conflict resolution procedures.

(n) Global and international responsibilities relating to the environment must be discharged in the national interest.

The primary aim of an oxidation pond system is to effectively treat wastewater by removing contaminants and pollutants. This includes organic matter, suspended solids, nutrients (such as nitrogen and phosphorus), and pathogens (disease-causing microorganisms). The system utilizes natural processes, including microbial activity and solar energy, to break down and treat the wastewater.

The oxidation pond system also aims to protect the environment by treating wastewater before its release into natural water bodies. By removing contaminants and pollutants, the system helps prevent the degradation of water quality, safeguarding ecosystems, and minimizing potential impacts on human health. It promotes sustainable water management practices by reducing pollution and protecting water resources.

The proposed construction of an oxidation pond system and two gravity outfall sewer lines, provide an efficient, environmentally sustainable, and cost-effective means of treating wastewater, thereby protecting public health, preserving water quality, and minimizing the impact of wastewater discharge on the environment and therefore, global, and international responsibilities relating to the environment will be discharged in the national interest.

(o) The environment is held in public trust for the people, the beneficial use of environmental resources must serve the public interest and the environment must be protected as the people's common heritage.

Through the appointment of various specialists (Ecological, Agricultural and Heritage), mitigation measures have been compiled to ensure that the proposed project does not harm the environment. Architectural plans were designed according to South African Norms and Standards.

(p) The costs of remedying pollution, environmental degradation, and consequent adverse health effects and of preventing, controlling, or minimising further pollution, environmental damage or adverse health effects must be paid for by those responsible for harming the environment.

An EMP'r was compiled to prevent or minimise any potential negative impacts to the environment. It will be the responsibility of the Applicant and Contractor to adhere to all measures set out in the EMP'r, to give effect to Section 28 (1) of NEMA.

(q) The vital role of women and youth in environmental management and development must be recognised and their full participation therein must be promoted.

The recruitment selection process should seek to promote gender equality and the employment of woman wherever possible, particularly for less labour-intensive work.

(r) Sensitive, vulnerable, highly dynamic, or stressed ecosystems, such as coastal shores, estuaries, wetlands, and similar systems require specific attention in management and planning procedures, especially where they are subject to significant human resource usage and development pressure.

A Sensitivity map containing all vulnerable vegetation, watercourses and ecosystems were prepared to determine that the proposed project will have no negative impact thereon.

1.6 APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES

The following lists of Legislation, Policies and Guidelines from all spheres of Government are applicable to the Application as contemplated in the EIA Regulations:

Table 4: Applicable Legislation, Policies and/or Guidelines applicable to the Project.

Title of Legislation, Policy, or Guideline	Applicability to the Project	Administering Authority	Date
National Environmental Management Act, 1998 (Act No. 107 of 1998) and the Environmental Impact Assessment Regulations, 2017 (as amended) published in Government Notice Regulation No. 327 and 324	The proposed upgrade will trigger Listed Activities as outlined in GN R. 327 and 324 and is subject to an Environmental Impact Assessment as per the National Environmental Management Act, 1998 (Act No. 107 of 1998).	National Department of Forestry, Fisheries and Environmental Affairs	2021
Government Notice Regulation No. 326 of 07 April 2017 (as amended)	GN R. 326 provides the steps and requirements that need to be followed and included within the Environmental Impact Assessment.	National Department of Forestry, Fisheries and Environmental Affairs	2021
National Heritage Resources Act, 1999 (Act No. 25 of 1999)	Section 38 (1) (c) states that a Heritage Permit must be obtained for any development or activity that will change the character of a site (i) exceeding 5 000 m ² in extent. As such, an application has been submitted to the Competent Authority.	South African Heritage Resources Agency	1999
National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)	Determination of biodiversity impacts. Should any protected plant species be observed on site an application to relocate the plants must be submitted.	National Department of Forestry, Fisheries and Environmental Affairs	2004
Dr Ruth Segomotsi Mompoti District Municipality Integrated Development Plan	The proposed development is in line with the IDP.	Dr Ruth Segomotsi Mompoti District Municipality	2020 – 2021
Dr Ruth Segomotsi Mompoti District Municipality Spatial Development Framework	It must be ensured that the proposed development is in line with the SDF.	Dr Ruth Segomotsi Mompoti District Municipality	2019

Title of Legislation, Policy, or Guideline	Applicability to the Project	Administering Authority	Date
National Environmental Management: Waste Act 59 of 2008 (NEMWA)	To provide for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes and seascapes	Department of Environmental Affairs	2003
National Water Act (Act 36 of 1998)	Promotes the protection, use, development, conservation, management, and control of water resources in a sustainable and equitable manner	DWS – National and provincial	1998
Occupational Health and Safety Act, 1993 (Act No. 85 of 1993):	The purpose of this Act is to provide for the health and safety of persons at work and for the health and safety of persons in connection with the use of plant and machinery; the protection of persons other than persons at work against hazards to health and safety arising out of or in connection with, the activities of persons at work. The proposed development will therefore be subject to this Act during the construction and operational Application for Environmental Authorisation.	Department of Labour	1993
National Environmental Management: Air Quality Act 39 of 2004	To provide for the protection of and prevention of quality	Department of Environmental Affairs	2004

1.7 WASTE, EFFLUENT AND NOISE MANAGEMENT

1.7.1 WASTE MANAGEMENT

The overall objective of waste management is to:

- Formalise waste handling, transfer and disposal activities associated with waste from the proposed development;
- To prevent inappropriate management of waste and associated risk of pollution of the environment;
- To facilitate waste minimisation entailing avoidance, reduction, re-use, recycling, or treatment before disposal;
- To streamline waste segregation, storage, disposal and promote resource recovery from waste;
- Contain, control, and dispose of waste in accordance with the required waste management practices;
- Define responsibility for waste management at the various levels of operation associated with the operational activities; and,
- To provide a framework for the selection of waste management service providers in line with the cradle to grave principles.

Waste minimisation mitigation measures which are in-line with the aforementioned objectives for the construction and operational phases are included within the EMP'r. Waste comprising of cement bags and general construction-related solid waste will be collected on site and kept at a temporary designated area and regularly removed by the Contractor to be disposed of at a permitted landfill site. The contractor must ensure that waste separation between hazardous and non-hazardous waste take place on site and hazardous waste must be delivered to a registered hazardous waste management facility. This will be included in the EMPr.

Sludge generated from the operation will be cleaned out and transported to the existing Schweizer Reneke Waste Water Treatment Works.

1.7.2 NOISE MANAGEMENT

Noise will be generated during the construction and maintenance activities of the proposed developments. During the construction phase noise will emanate from the following activities:

- The establishment of a site camp;
- Movement of construction vehicles on site;
- Use of machinery and power tools;
- Presence of construction personnel working on site; and,
- Delivery of construction material.

Mitigation measures are outlined within the EMPr to assure noise impacts are adequately addressed and managed in order not to become a nuisance within the study area.

1.8 WATER USE AND ENERGY EFFICIENCY

1.8.1 WATER USE:

The two (2) gravity outfall sewer pipelines will be used to transport the sewage from the surrounding area to the oxidation pond to treat and purify the sewage. Water for general use during the construction will be obtained through the municipality.

1.8.2 ENERGY EFFICIENCY:

The electricity requirements of the project are low. Municipal and Eskom electricity will be provided at pump stations with a standby generator. Delivery vehicles and other construction equipment will use petrol, diesel, and oil during construction. Use and number of such vehicles and machinery will be restricted to that which is absolutely necessary for material delivery.

Where possible energy efficient light bulbs will be used where it is practical.

2 SECTION B: SITE/AREA/PROPERTY DESCRIPTION

2.1 PROPERTY DETAILS

Table 5: Property details of the Oxidation Pond and two gravity outfall sewer lines

Province	North West Province
District Municipality	Dr Ruth Segomotsi Mompati District Municipality
Local Municipality	Mamusa Local Municipality
Ward Number(s)	Ward No. 7
Farm name and number	Portion 1 of the Farm Schweizer Reneke Town and Townlands 62 HO Portion 21 of the farm Palachoema 64 HO
Portion Number	Portion 1 of the Farm Schweizer Reneke Town and Townlands 62 HO Portion 21 of the farm Palachoema 64 HO
SG Code	T0H00000000006200000

2.2 GROUNDWATER, SOIL AND GEOLOGICAL STABILITY

The table below provides a summary of the groundwater, soil, and geology stability of the study area.

Table 6: Groundwater, Soil and Geological Stability of the site.

Description	Oxidation Pond	Western Sewer Line	Eastern Sewer Line
Shallow water table (less than 1.5m deep)	NO X	NO X	NO X
Dolomite, sinkhole, or doline areas	NO X	NO X	NO X
Seasonally wet soils (often close to water bodies)	YES X	YES X	YES X
Unstable rocky slopes or steep slopes with loose soil	NO X	NO X	NO X
Dispersive soils (soils that dissolve in water)	NO X	NO X	NO X
Soils with high clay content (clay fraction more than 40%)	NO X	NO X	NO X
Any other unstable soil or geological feature	NO X	NO X	NO X
An area sensitive to erosion	NO X	NO X	NO X

2.3 GROUNDCOVER AND SURFACE WATER

The following groundcover is present on site:

Table 7: Groundcover of the site.

Natural veld – good condition	Natural veld with scattered aliens X	Natural veld with heavy alien infestation	Veld dominated by alien species	Gardens
Sport Field	Cultivated Land	Paved Surfaces	Building or other Structures	Bare Soil

The following surface water is present on/or adjacent to the site and alternative sites.

Table 8: Types of surface water present on site.

Perennial River	Yes X	
Non-Perennial River		No X
Permanent Wetland		No X
Seasonal Wetland		No X
Artificial Wetland	Yes X	
Estuarine/Lagoon Wetland		No X

The proposed development is planned within 500m of delineated wetlands. Buffer/regulated areas around the watercourses have been recommended based on Buffer Zone Guidelines for Wetlands, Rivers, and Estuaries (Macfarlane and Bredin, 2017). A general 34 m buffer around the floodplain and 37 m around channelled valley bottom wetland has been recommended to mostly reduce the risk of sediment loading and erosion (Smith, 2023).

In terms of the eastern stream, trenching is expected within the watercourse and thus, mitigation measures have been recommended to minimise the impacts of the watercourse.

Although the proposed development will impact various watercourses/wetlands, these are already highly impacted and disturbed. The proposed prospecting footprint is expected to be of **low sensitivity** for the Aquatic Biodiversity Theme (Smith, 2023).

2.4 ECOLOGICAL AND BIODIVERSITY

The proposed development area will be discussed in detail in terms of the vegetation type, fauna and flora, Present Ecological State (PES) and Ecological Importance and Sensitivity (EIS).

2.4.1 VEGETATION TYPE

The proposed development site (demarcated in blue) consists of Schweizer Reneke Bushveld.

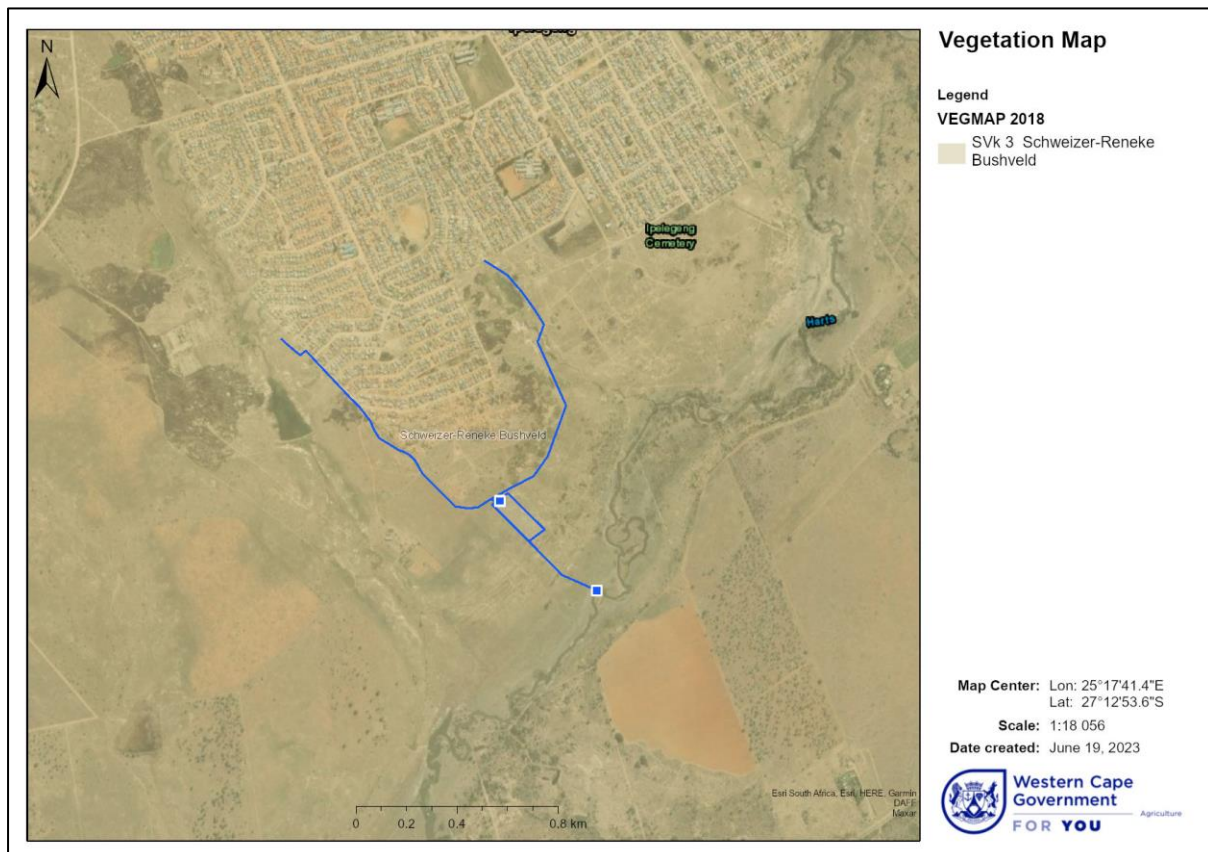


Figure 7: Vegetation types within the proposed development site (demarcated in blue)

Schweizer-Reneke Bushveld is located in the North-West Province of South Africa in an area to the east of Amalia in the west and from farming areas around Broedersput in the north to Never Mind (Christiana District) in the south. Altitude is 1250-1400 m.

Vegetation and landscape features: Plains, slightly undulating plains, and some hills, supporting open woodland with a fairly dense shrub layer, with trees *Acacia erioloba*, *Acacia karroo*, *Acacia tortilis*, *Searsia lancea* and shrubs *Acacia hebeclada*, *Diospyros lycioides*, *Grewia flava* and *Tarchonanthus camphoratus*.

Geology and soils: Andesitic lavas of the Allanridge Formation of the Ventersdorp Supergroup, sometimes covered with silcrete or calcrete of the Kalahari Group. Deep (0.9-1.2 m) sandy soils, with Hutton and Clovelly the dominant soil forms. Land Types: Ah and Ae and some Bc.

Important taxa of the Schweizer-Reneke Bushveld listed by Mucina & Rutherford (2006): Tall tree: *Acacia erioloba*. Small trees: *Acacia karroo*, *Acacia tortilis subsp. heteracantha*, *Rhus lancea*. Tall shrubs: *Asparagus larcinus*, *Diospyros lycioides subsp. lycioides*, *Grewia flava*, *Tarchonanthus camphoratus*, *Diospyros pallens*, *Ehretia rigida subsp. rigida*, *Gymnosporia buxifolia*, *Rhus tridactyla*. Low shrubs: *Acacia hebeclada subsp. hebeclada*, *Aptosimum decumbens*, *Chrysocoma ciliata*, *Gnidia polycephala*, *Pentzia viridis*. Woody climber: *Asparagus africanus*. Graminoids: *Antheophora pubescens*, *Digitaria eriantha subsp. eriantha*, *Heteropogon contortus*, *Stipagrostis uniplumis*, *Themeda triandra*, *Aristida congesta*, *Aristida stipitata var. spicata*, *Chloris virgata*, *Cynodon dactylon*, *Eragrostis biflora*, *Eragrostis rigidior*, *Eragrostis superba*, *Eragrostis trichophora*, *Sporobolus fimbriatus*. Herbs: *Barleria macrostegia*, *Hermannia tomentosa*, *Hibiscus pusillus*, *Indigofera daleoides*, *Lippia scaberrima*, *Osteospermum muricatum*, *Pollichia campestris*, *Rhyncosia adenodes*.

Schweizer Reneke Bushveld is currently listed as Vulnerable (A3) in Government Notice 2747 (November 2022). National land cover data show that Schweizer-Reneke Bushveld has experienced extensive spatial declines of approximately 51% since 1750.

Table 9: Plant species recorded on the proposed development footprint on 18 November 2022.

Species name	Habitat Unit	Common name	Family	Redlist status	Protected Status	Alien Invasive Species Category
<i>Argemone ochroleuca</i>	Transformed	Mexican Poppy	PAPAVERACEAE	N/A	Not Protected	1b
<i>Gomphocarpus fruticosus</i>	Transformed	Wild Cotton	APOCYNACEAE	Least Concern	Not Protected	N/A
<i>Mestoklema tuberosum</i>	Degraded	Donkey Fig	AIZOAZEAE	Least Concern	Not Protected	N/A
<i>Aloe greatheadii</i>	Degraded	Spotted Aloe	ASPHODELACEAE	Least Concern	Not Protected	N/A
<i>Ammocharis coranica</i>	Degraded	Karoo Lily	AMARYLLIDACEAE	Least Concern	Not Protected	N/A
<i>Ruschia ruralis</i>	Degraded	N/A	FABACEAE	Least Concern	Not Protected	N/A
<i>Pterodiscus</i> sp.	Degraded	N/A	PEDALIACEAE	N/A	Provincially Protected	N/A
<i>Schoenolirion croceum</i>	Degraded	Yellow Sunnysbell	ASPARAGACEAE	Least Concern	Not Protected	N/A
<i>Cirsium vulgare</i>	Transformed	Spear Thistle	ASTERACEAE	N/A	Not Protected	1b
<i>Vachellia</i> sp.	Degraded	N/B	FABACEAE	N/A	Not Protected	N/A
<i>Pseudognaphalium</i> sp.	Transformed	Cutweed	ASTERACEAE	Least Concern	Not Protected	N/A
<i>Searsia</i> sp.	Degraded	N/A	ANACARDIOIDEAE	N/A	Not Protected	N/A
<i>Cynodon dactylon</i>	Transformed	Quick Grass	POACEAE	Least Concern	Not Protected	N/A
<i>Chrysocoma</i> sp.	Degraded/transformed	N/A	ASTERACEAE	N/A	Not Protected	N/A
<i>Wahlenbergia undulata</i>	Degraded	African bluebell	CAMPANULACEAE	Least Concern	Not Protected	N/A
<i>Gazania</i> Sp.	Transformed	N/A	ASTERACEAE	N/A	Not Protected	N/A
<i>Avena fatua</i>	Transformed	Wild Oat	POACEAE	Least Concern	Not Protected	N/A

2.4.2 ECOLOGICAL IMPORTANCE AND SENSITIVITY (EIS)

Based on the site inspection, the overall development footprint is verified to be mostly degraded with a patch of semi-intact terrestrial area on the proposed oxidation ponds' footprint (Figure 8). The overall footprint has been subjected to disturbance via livestock grazing, improper stormwater drainage and litter. The areas surrounding the proposed development were confirmed to be informal settlements to the north and east of the proposed development. To the west of the proposed development footprint is a previously cultivated land and to the south is open land and eventually, the Harts River.

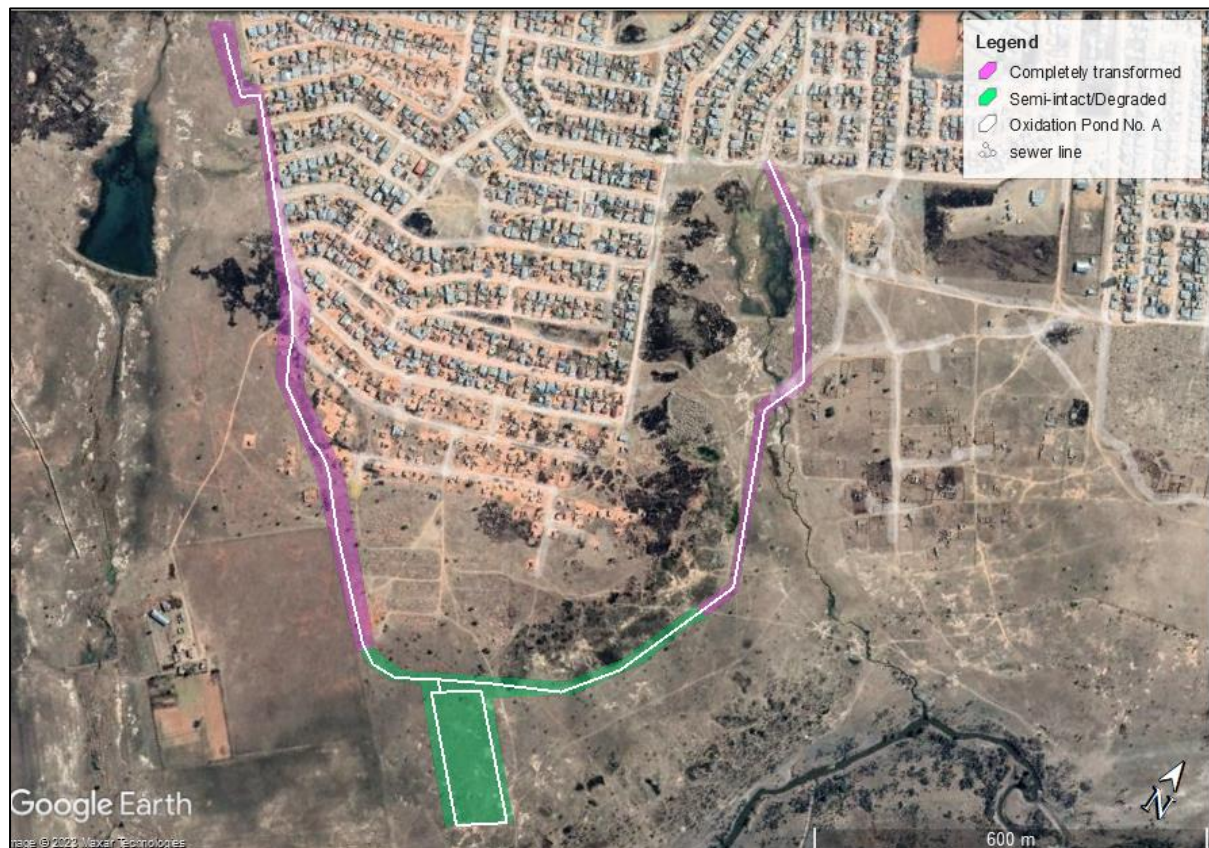


Figure 8: Habitat Units within the proposed development footprint (demarcated in white)

Areas delineated as completely transformed (Figure 8) are areas that do not represent the indigenous vegetation in function, form, and species diversity. These areas are dominated by weeds, and aliens such as *Argemone ochroleuca*, *Cirsium vulgare*, *Pseudognaphalium* sp., *Cynodon dactylon*, and *Avena fatua*. Because the area is dominated by grass and alien species, it indicates the past and current presence of heavy disturbance. This is likely due to grazing from livestock, general usage by the local residents, and illegal dumping. The area does not represent any conservation value and is unlikely to provide habitat to any Species of Conservation Concern.

Areas delineated as degraded (Figure 8) are areas that represent some elements of the indigenous vegetation but have important vegetation layers missing. The area does inhabit some indigenous species such as *Mestoklema tuberosum*, *Aloe greatheadii*, *Ammocharis coronica*, *Searsia* sp., but also shows signs of alien invasive species and weed invasion. Alien invasive/weed species on the footprint include *Cynodon dactylon* and *Argemone ochroleuca*. Although the area inhabits tree species such as *Searsia* sp., and *Vachellia* sp., there is a distinct tree layer (an identifying feature of Schweizer Reneke Bushveld) missing. The aforementioned and the presence of alien invasive/weed species indicates past and present disturbance. This disturbance is likely to be a result of grazing, fire, and general usage by local residents. The area does not represent any conservation value and is unlikely to provide habitat to any Species of Conservation Concern.

Although the area inhabits indigenous vegetation, the area is unlikely to function the same as Schweizer Reneke Bushveld. However, the area has some ecological function given that it could provide some habitat and foraging area for various fauna. The site is unlikely to be a representation of an area of high conservation value.

The Site Ecological Importance (SEI) of footprint was evaluated as Low and Very Low (Smith, 2023) for each of the habitat units. The aforementioned was determined based on the low biodiversity value and ecological functioning and high recovery rate.

2.4.3 RED LISTED SPECIES

No listed species of vultures, trees, spiders, butterflies, Odonata, lacewings, dung beetles, frogs, fish, or scorpions are known from the QDS (2229AB; ADU, 2017).

2.4.4 SENSITIVE AREAS

The CBA has been classified as being a Critical Corridor Linkage area (CBA_T8) as well as a Corridor (CBA_T7). Therefore, the primary purpose of the sensitive area is to perform the function of a Biodiversity Corridor. Due to the degraded nature of the footprint and small footprint, it is expected that the development will have limited impact on the functioning of the CBA. Fauna movement and seed dispersal of the flora are expected to still occur effectively throughout the CBA should the development take place.

2.4.5 PLANT SPECIES

No species of special concern were identified by the Department of Forestry Fisheries and the Environment (DFFE) Screening Tool. No species of special concern were recorded on the footprint. However, the area does represent habitat for the protected tree species, *Vachellia erioloba* (Smith, 2023).

2.4.6 ANIMAL SPECIES

No species of special concern were identified by the DFFE Screening Tool. No species of conservation concern were recorded on the footprint. However, a variety of fauna were recorded on site including *Danaus chrysippus* (Plain Tiger Butterfly), *Zonocerus elegans* (Elegant Grasshopper), and dragonflies (Order: Odonata). Other common species that are likely to inhabit the area are listed in Appendix C. Given that there is potential habitat surrounding the development footprint, any faunal species that inhabits the development footprint, will likely be able to find refuge in the surrounding areas (Smith, 2023).

2.5 CULTURAL AND HISTORICAL FEUTURES

2.5.1 ARCHAEOLOGICAL FINDINGS

In the development of the Amalia Extension 5 Township project, Pelser did not identify any archaeological sites. However, some historic farming remnants were recorded on site as well as a couple of cemeteries (Pelser, 2014, SAHRIS NID 167803). In Coetzee's (2017) HIA for proposed diamond mining prospecting no Stone Age or Iron Age archaeological sites were found but further burial grounds and graves were recorded along with various historic homesteads. Coetzee further noted that, "Although erosion areas near the Harts River yielded no Stone Age assemblages, it is well known that Late Iron Age stone-walled settlements do not usually occur in open low-lying grasslands. The well-known Korana settlements of Chief Mossweu are located near Mamusa Hill (further west near Schweizer-Reneke) and other Tswana settlement (Rolong and Tlhaping) occur further north and west of the survey area. A total of four historical farmhouse complexes or individual houses dating to the late 19th

and early 20th centuries were recorded. In addition, one historical stonewalled cattle kraal was also noted. These structures are associated with the land granted to the local farmers by Chief Mossweu in 1882. Seven graveyards and individual graves were recorded which represent farm workers and the families that settled in the area since the 1880s. If the exhumation and reburial of the graveyards are envisaged, it will entail social consultation and permit application". Given the extremely small footprint of the sewer upgrades and the highly disturbed ground that has already been heavily impacted by urbanisation and farming, it is unlikely that any significant archaeological heritage resources will be found for this development (CTS Heritage, 2022). There are no buildings or cultural landscape elements in the proposed development area (CTS Heritage, 2022).

The proposed route of the pipeline falls within an existing path around a cemetery serving the community of Ipelegeng in Schweizer-Reneke. It is clear that the proposed development may well impact on modern graves and the route and excavation work will have to be carefully done to avoid impacts on any graves, however this is not a heritage concern as these graves are modern (CTS Heritage, 2022).

2.5.2 PALAEOLOGICAL FINDINGS

The proposed sewer system upgrades fall in an area of insignificant/zero palaeontological sensitivity according to the SAHRIS Palaeosensitivity map as the geological context consists of biotite gneiss, augen gneiss, porphyritic and homogeneous granite, and pegmatite. There is therefore no need to carry out further palaeontological studies for this development (CTS Heritage, 2022).

2.6 SOCIO-ECONOMIC CHARACTER OF THE AREA

Mamusa Local Municipality (NW393) covers a total area of approximately 3 681 km². This land mass is 7,8% of the total area of the Dr. Ruth S Mompati District Municipality. The administrative centre of the municipality is in the rural area of Schweizer-Reneke situated on the banks of the Harts River and at the foot of the Mamusa hills. The town of Schweizer-Reneke is the only town in Mamusa Local Municipality and is surrounded by agricultural farms. Schweizer-Reneke is the main administration centre for the local municipality and is closer to the township called Ipelegeng (Stats SA, 2011).

Mamusa Local Municipality is an agriculture-based municipality, where both livestock and crops are being farmed. Most of its income is derived from the agricultural sector. Schweizer-Reneke is surrounded by farms, which are the main employers within the municipality, with a small number employed by the local retail trade sector and government (Stats SA, 2011).

The socio-economic character of the Mamusa Local Municipality is summarised below:

1. Employment Figures:

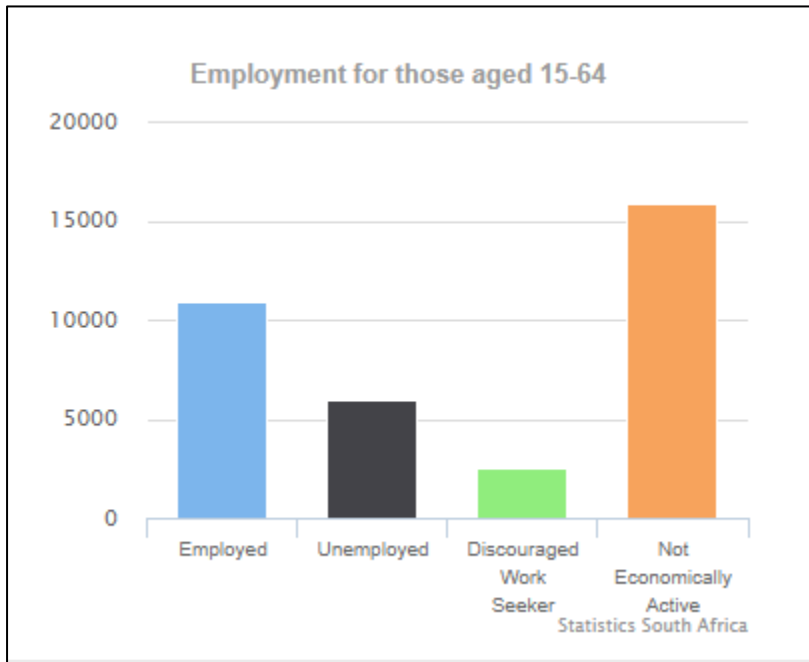


Figure 9: Employment figures for the Mamusa Local Municipality (Stats SA, 2011).

2. Level of Education within the Mamusa Local Municipality:

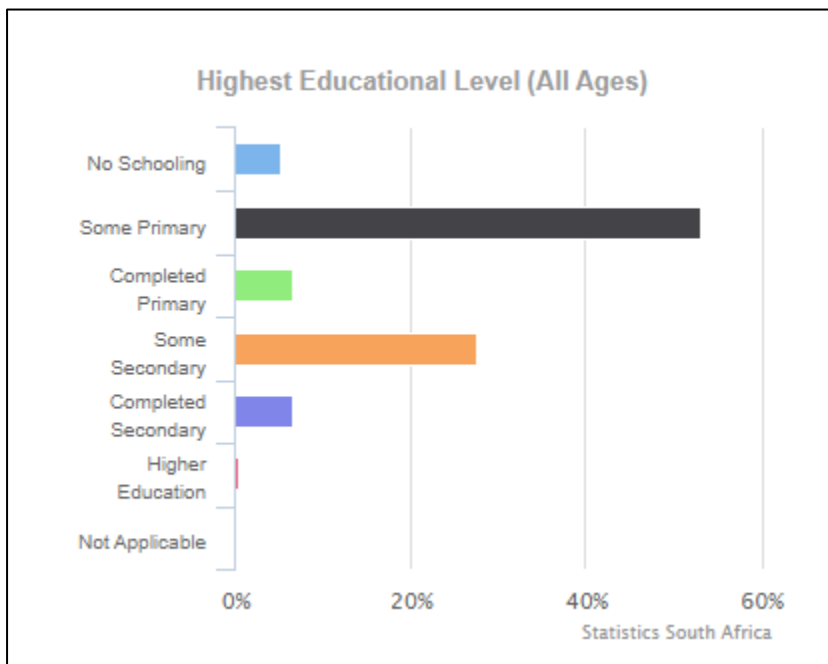


Figure 10: Education figures for the Mamusa Local Municipality (Stats SA, 2011).

2.6.1 ECONOMIC PROFILE OF THE PROPOSED DEVELOPMENTS

It is foreseen that the construction phase will create employment for approximately sixty (60) individuals for a duration of eighteen (18) months. The total value of these employment opportunities is estimated at seven million one hundred and thirty-seven thousand (R7 137 000.00). All employment opportunities will be accrued to previously disadvantaged individuals from the local community.

3 SECTION C: PUBLIC PARTICIPATION PROCESS

The following Section will provide a summary of the PPP Report (Please refer to Appendix: E) which was undertaken in terms of the NEMA.

3.1 ADVERTISEMENT AND NOTICES

Table 10: Details of Placement of Advertisements and Site Notices.

Publication Name:	Beeld	
Date Published:	2 February 2023	
Site Notice Position:	Latitude	Longitude
	27°11'35.4"S	25°19'42.7"E
	27°12'32.32"S	25°17'45.07"E
	27°12'40.17"S	25°17'14.07"E
Date Placed:	25 January 2023	

Please refer to Appendix E1: Proof of Placement of Advertisements and Site Notices.

3.2 INTERESTED AND AFFECTED PARTIES

The following Interested and Affected Parties have been identified by the EAP.

Table 110: I&APs Details.

NAME	CONTACT NUMBER	EMAIL ADDRESS	FARM/ERF NAME (OR BUSINESS)
T.E Mohapi	0837609368	mamusaprimary@gmail.com	Mamusaprimary 27°12'19.05"S 25°17'50.07"E
M. Ditsele	0604061976 0788238110	ipelecommunitycc@gmail.com	27°12'17.12"S 25°17'54.50"E
O.P Lephonetse	0785927361	-	27°12'39.93"S 25°17'54.76"E
Seoliti	0717674570		27°12'29.30"S 25°17'13.76"E
S.E Batsietseng	0539637155		27°12'32.14"S 25°17'50.10"E
L.D Motlhabane	0834975659		27°12'32.14"S 25°17'50.10"E

Proof of notifications sent to the I&APs will be provided in the Final Basic Assessment Report.

3.3 ORGANS OF STATE

The following Organs of State have been identified by the EAP and Applicant as Key Stakeholder.

Table 12: Organs of State Details.

ORGANISATION	NAME AND SURNAME	TEL/CELL	EMAIL
Municipal Manager - Mamusa Local Municipality	Mr Ruben Gincane	053 963 1331	gincaner@mamusalm.gov.za
Mamusa Local Municipality Ward Councillor	Jeanette Nyathi	078 145 0527	410ancpco@gmail.com
Acting Municipal Manager – Dr Ruth Segomotsi Mompoti District Municipality	Mr. Collen Colane	053 928 6400	colanen@bophirima.co.za
DEDECT - Chief Director for Environmental Services	Ms Lebogang Diale or Mr Jeff Motsumi	082 697 9433. / 018 388 1342	LDiale@nwpg.gov.za
Department of Public Works and Infrastructure	Mr. Ramabele Matlala	018 386 5268	Ramabele.Matlala@dpw.gov.za
North West Department of Public Works and Roads Director - Dr Ruth Segomotsi Mompoti District Municipality	Mr. Ntogelang Tumelo	053 928 7200	
South African Heritage Resources Agency	Esther Khoza	012 320 8490	ekhoza@sahra.org.za
Department of Agriculture	Emelda Setshako	060 745 4020	ESetshako@nwpg.gov.za
South African Civil Aviation Authority			obstacles@caa.co.za
North West Department of Defence	Jacob Motlounq	018 293 3805	potch@sa-armyfoundation.co.za
SANRAL		012 426 6200	oliverj@nra.co.za
ESKOM	Noxolo Galela	063 753 7396	GalelaN@eskom.co.za
DWS - Case Official	Ramusiya Tshedza		RamusiyaT@dws.gov.za

Proof of notifications sent to the Organs of State will be provided in the Final Basic Assessment Report.

4 SECTION D: IMPACT ASSESSMENT

4.1 IMPACT ASSESSMENT METHODOLOGY

For each potential impact, the EXTENT (Spatial scale), MAGNITUDE (degree of the impact), DURATION (time scale), PROBABILITY (occurrence), IRREPLACEABILITY (loss of resources) and the REVERSIBILITY (degree to which the proposed impact can be reversed) have been assessed by the EAP as well as the Specialists. The assessment of the above criteria will be used to determine the significance of each impact, with and without the implementation of the proposed mitigation measures. The scale to be used to assess these variables and to define the rating categories are tabulated in the Tables below.

Table 13: Evaluation components, ranking scales, and descriptions (criteria).

Evaluation component	Ranking scale and description (criteria)
MAGNITUDE of NEGATIVE IMPACT (at the indicated spatial scale)	<p>10 - Very high: Bio-physical and/or social functions and/or processes might be <i>severely</i> altered.</p> <p>8 - High: Bio-physical and/or social functions and/or processes might be <i>considerably</i> altered.</p> <p>6 - Medium: Bio-physical and/or social functions and/or processes might be <i>notably</i> altered.</p> <p>4 - Low : Bio-physical and/or social functions and/or processes might be <i>slightly</i> altered.</p> <p>2 - Very Low: Bio-physical and/or social functions and/or processes might be <i>negligibly</i> altered.</p> <p>0 - Zero: Bio-physical and/or social functions and/or processes will remain <i>unaltered</i>.</p>
MAGNITUDE of POSITIVE IMPACT (at the indicated spatial scale)	<p>10 - Very high (positive): Bio-physical and/or social functions and/or processes might be <i>substantially</i> enhanced.</p> <p>8 - High (positive): Bio-physical and/or social functions and/or processes might be <i>considerably</i> enhanced.</p> <p>6 - Medium (positive): Bio-physical and/or social functions and/or processes might be <i>notably</i> enhanced.</p> <p>4 - Low (positive): Bio-physical and/or social functions and/or processes might be <i>slightly</i> enhanced.</p> <p>2 - Very Low (positive): Bio-physical and/or social functions and/or processes might be <i>negligibly</i> enhanced.</p> <p>0 - Zero (positive): Bio-physical and/or social functions and/or processes will remain <i>unaltered</i>.</p>
DURATION	<p>5 - Permanent</p> <p>4 - Long term: Impact ceases after operational phase/life of the activity > 60 years.</p> <p>3 - Medium term: Impact might occur during the operational phase/life of the activity – 60 years.</p> <p>2 - Short term: Impact might occur during the construction phase - < 3 years.</p> <p>1 - Immediate</p>
EXTENT (or spatial scale/influence of impact)	<p>5 - International: Beyond National boundaries.</p> <p>4 - National: Beyond Provincial boundaries and within National boundaries.</p> <p>3 - Regional: Beyond 5 km of the proposed development and within Provincial boundaries.</p> <p>2 - Local: Within 5 km of the proposed development.</p> <p>1 - Site-specific: On site or within 100 m of the site boundary.</p> <p>0 - None</p>
IRREPLACEABLE loss of resources	<p>5 – Definite loss of irreplaceable resources.</p> <p>4 – High potential for loss of irreplaceable resources.</p> <p>3 – Moderate potential for loss of irreplaceable resources.</p> <p>2 – Low potential for loss of irreplaceable resources.</p> <p>1 – Very low potential for loss of irreplaceable resources.</p> <p>0 - None</p>
REVERSIBILITY of impact	<p>5 – Impact cannot be reversed.</p> <p>4 – Low potential that impact might be reversed.</p> <p>3 – Moderate potential that impact might be reversed.</p> <p>2 – High potential that impact might be reversed.</p> <p>1 – Impact will be reversible.</p> <p>0 – No impact.</p>
PROBABILITY (of occurrence)	<p>5 - Definite: >95% chance of the potential impact occurring.</p> <p>4 - High probability: 75% - 95% chance of the potential impact occurring.</p> <p>3 - Medium probability: 25% - 75% chance of the potential impact occurring</p> <p>2 - Low probability: 5% - 25% chance of the potential impact occurring.</p> <p>1 - Improbable: <5% chance of the potential impact occurring.</p>
Evaluation component	Ranking scale and description (criteria)
CUMULATIVE impacts	High: The activity is one of several similar past, present or future activities in the same geographical area, and might contribute to a very significant combined impact on the natural, cultural, and/or socio-economic resources of local, regional or national concern.

	<p>Medium: The activity is one of a few similar past, present or future activities in the same geographical area, and might have a combined impact of moderate significance on the natural, cultural, and/or socio-economic resources of local, regional, or national concern.</p> <p>Low: The activity is localised and might have a negligible cumulative impact.</p> <p>None: No cumulative impact on the environment.</p>
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Once the evaluation components have been ranked for each potential impact, the significance of each potential impact will be assessed (or calculated) using the following formula:

- **SP (Significance Points) = (Magnitude + Duration + Extent + Irreplaceability + Reversibility) x Probability**

The maximum value is 150 SP (Significance Points). The unmitigated and mitigated scenarios for each potential Environmental Impact should be rated as per the Table below.

Table 14: Definition of significance ratings) positive and negative).

Significance Points	Environmental Significance	Description
125 – 150	Very high (VH)	An impact of very high significance will mean that the project cannot proceed, and that impacts are irreversible, regardless of available mitigation options.
100 – 124	High (H)	An impact of high significance which could influence a decision about whether or not to proceed with the proposed project, regardless of available mitigation options.
75 – 99	Moderate-high (MH)	If left unmanaged, an impact of medium-high significance could influence a decision about whether or not to proceed with a proposed project. Mitigation options should be relooked.
40 – 74	Moderate (M)	If left unmanaged, an impact of moderate significance could influence a decision about whether or not to proceed with a proposed project.
<40	Low (L)	An impact of low is likely to contribute to positive decisions about whether or not to proceed with the project. It will have little real effect and is unlikely to have an influence on project design or alternative motivation.
+	Positive impact (+)	A positive impact is likely to result in a positive consequence/effect and is likely to contribute to positive decisions about whether or not to proceed with the project.

4.2 POTENTIAL IMPACTS DURING PLANNING, DESIGN AND CONSTRUCTION PHASE

Planning, design, and construction phase	Layout Alternative 1 (Preferred Layout)		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
POTENTIAL IMPACTS ON GEOGRAPHICAL, GEOLOGICAL AND PHYSICAL ASPECTS:					
Nature of impact: Negative impact of haphazard placement of infrastructure on the environment.	Activity: The proper establishment of a main site office and storage site during the construction period will ensure that the poor placement of materials and infrastructure will be avoided. Poor placement could also result in the damage or pollution to surrounding areas caused by construction activities.				No construction phase impacts are associated with the no-go alternative thus no assessment has been undertaken.
Significance rating:	L	L	-	-	-
Cumulative impact:	-	-	-	-	-
Proposed Mitigation:	<ul style="list-style-type: none"> • Draw up and submit for approval a Site Layout Master Plan. This plan must show the final positions and extent of all permanent and temporary site structures and infrastructure; • The planning for layout must be done in consultation on-site with the Environmental Control Officer (ECO); • The Contractor may not deface, paint, damage or mark any natural features situated in or around the site for survey or other purposes; • The Contractor must ensure that all construction personnel, labourers, and equipment always remain within the demarcated construction sites; • No servicing of vehicles may be permitted on site, unless for emergency purposes; • Stockpiles may not be situated in such a manner that they obstruct pathways; • Location of storage area must consider prevailing winds, distance to water bodies and general on-site topography; • Place infrastructure as far as possible on sites that have already been transformed; • Facilities may not be used as staff accommodation; • The Contractors camp layout must consider availability of access for deliveries and services and any future works; • The Contractors camp must be of sufficient size to accommodate the needs of all sub-contractors that may work on the project; and, • The Contractor must implement the following as required: <ul style="list-style-type: none"> ○ Suitable sanitation facilities, adequate for the number of staff on site (1 for every 15 personnel and 1 for each gender); and, 				N/A

Planning, design, and construction phase	Layout Alternative 1 (Preferred Layout)		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
	o Facilities for solid waste collection.				
Nature of impact: Topsoil Removal and Soil Erosion.	Activity: The clearing of topsoil and excavation for the establishment of building foundations may result in the destruction of fertile topsoil and loss of vegetation cover associated with the development as well as access road.				No construction phase impacts are associated with the no-go alternative thus no assessment has been undertaken.
Significance rating:	MH	L	-	-	-
Cumulative impact:	L	L	-	-	-
Proposed Mitigation:	<ul style="list-style-type: none"> Remove topsoil approximately 300 mm deep from establishment area and stockpile areas; Topsoil stockpiles to be kept free from weeds; Topsoil stockpiles to be placed on a levelled area and measures to be implemented to safeguard the piles from being washed away in the event of heavy rain/storm water; Topsoil needs to be stored on designated areas only. This need to be planned and indicated in the site-layout plan; Ensure that topsoil is not mixed with subsoil and/or any other excavated material; Provide containment and settlement facilities for effluents from concrete mixing and washing facilities; Temporarily stored topsoil must be re-applied within 6 months, topsoil stored for longer need to be managed according to a detailed topsoil management plan; Provide spill containment facilities for hazardous materials like fuel and oil; Topsoil must be used in all rehabilitation activities and may not be compacted to ensure that its plant support capacity remain of high quality; and, Rehabilitate denude areas especially slopes with appropriate species and erosion protection measures i.e., geotextiles, rocks, topsoil mixtures as per specifications. Implement suitable erosion prevention measures during the construction phase. Soil erosion must be controlled as an ongoing management strategy throughout the various phases of the proposed development activities. Make use of surface erosion control measures within disturbed areas to avoid erosion in times of high risk (e.g., rain season and time of high wind speeds). Stormwater management along any roadways and paths to reduce gully erosion formation. 				N/A

Planning, design, and construction phase	Layout Alternative 1 (Preferred Layout)		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
	<ul style="list-style-type: none"> Stormwater management should prevent excessive sediment to be carried into drainage channels and the natural environment. Removal of debris and other obstructing materials from the site must take place and erosion preventing structures must be constructed. This is done to prevent damming of water and increasing flooding danger. Disturbed areas, that will not form part of the operational footprint, but which were disturbed as part of the construction activities, should be rehabilitated and re-vegetated using site-appropriate vegetation and/or seed mixes, to prevent gulley erosion. Sheet runoff from cleared areas, paved surfaces and access roads needs to be curtailed. No materials of any kind are allowed to be stored in the stormwater channels. Areas around the proposed project footprint, must be adequately rehabilitated to prevent significant erosion. Avoid the use of concrete lined channels for storm water management as this can increase the speed of water. This in turn increases erosion potential that can cause erosion on site and in watercourse banks and increase siltation downstream. If concrete-lined channels are used; they should end in silt traps. Soil disturbance must be kept to a minimum within and around the development footprint. All stockpiles must be stored outside of wetland buffers. Stockpiles must be covered in periods high wind and rain. 				
Nature of impact: Surface and groundwater contamination due to construction activities such as the use of hazardous materials on site e.g., fuel and oil.	Activity: Spills could possibly occur on site and lead to the contamination of soil and groundwater.				No construction phase impacts are associated with the no-go alternative thus no assessment has been undertaken.
Significance rating:	M	L	-	-	-
Cumulative impact:	L	-	-	-	-
Proposed Mitigation:	<ul style="list-style-type: none"> Concrete must be mixed on mixing trays only and not on exposed soil. Concrete must be mixed only in areas which have been specially demarcated for this purpose (preferable where no natural vegetation occurs); Concrete mixing to be carried out away from sensitive areas and on impermeable surfaces; 				N/A

Planning, design, and construction phase	Layout Alternative 1 (Preferred Layout)		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
	<ul style="list-style-type: none"> Material Safety Data Sheets (MSDSs) must be available on site for all chemicals and hazardous substances to be used on-site, including information on their ecological impacts and how to minimize the impacts in case of leakage; All spillages must be cleaned up immediately after they have occurred; Spillage of petrochemical products must be avoided. In the case of accidental spillage, contaminated soil must be removed for bioremediation or disposed of at a facility for the substance concerned. Disturbed land must be rehabilitated and seeded with vegetation seed naturally occurring on site; Do not locate any ablution facilities, sanitary convenience, septic tank, or French drain within the 1:100-year flood line, or within a horizontal distance of 100 m (whichever is greater) of a watercourse or drainage line; Vehicles and machinery must be regularly serviced to avoid leakages; At the work site the Contractor must maintain strict surveillance to ensure that no spills occur; No water courses may be used to clean equipment, or for bathing. All cleaning operations must take place off site at a location where wastewater can be disposed of correctly; The discharge of any pollutants such as cement, concrete, lime, chemicals, etc. into the natural environment and the storm water system must strictly be prohibited; Fuel and chemical storage must be done within a designated area only, which is properly bund and able to contain 110% of the capacity of fuel or chemicals stored within; Construction vehicles must be inspected every morning before work commence to ensure that no leakages do occur; All personnel must receive induction on how to report spillages, contain them and treat them accordingly; Spill kits must be available at each working station; Drip trays must be placed beneath all construction equipment that are stationary on site or within the site camp; and, Hazardous waste must be stored in bins with a lid in a demarcated waste area and must be disposed of at a hazardous treatment facility with records on file. 				
Nature of impact: Handling of general waste materials on the development site.	Activity: The presence of personnel and construction operations on site will increase the likelihood of littering and the dumping of solid waste.				No construction phase impacts are associated with the no-go alternative thus no assessment has been undertaken.
Significance rating:	M	L	-	-	-
Cumulative impact:	-	-	-	-	-

Planning, design, and construction phase	Layout Alternative 1 (Preferred Layout)		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
Proposed Mitigation:	<ul style="list-style-type: none"> An adequate number of scavenger proof litter bins are to be placed throughout the site. Two (2) waste bins at least must be present, one (1) for hazardous waste and one (1) for non-hazardous waste at each working site. Dumping of waste on site is prohibited; Waste sorting and separation must form part of the environmental induction and awareness programme, to encourage personnel to collect wastepaper, glass, and metal waste separately; Keep all work sites including storage areas, offices, and workshops neat and tidy; Dedicate a demarcated and signposted storage area on site for the collection of construction waste; All domestic waste is to be removed from site and disposed of at a registered solid waste landfill site as mentioned in the Basic Assessment Report; Care must be taken to ensure that no waste fall off disposal vehicles on-route to the landfill. If needed, a tarpaulin can be utilised; The burning or burying of solid waste on site is prohibited. Do not burn PVC pipes or other plastic materials, as this is regarded as hazardous waste; Littering by construction workers shall not be permitted; General refuse/rubbish shall be removed from site on a weekly basis to an approved registered landfill site or as soon as the waste bins are reaching full capacity; Minimise waste by sorting wastes into recyclable and non-recyclable waste; Ablution facilities must be serviced by a registered service provider, cleaned at least once a week, and safe disposal slips must be on file at the site office; A bi-weekly (twice a week) litter patrol of the entire site shall be conducted by the designated Environmental Site Agent (ESA); Hazardous waste must be sorted from non-hazardous waste and disposed of at a hazardous treatment facility, records and proof of disposal must be kept; and, A register must be kept of the quantities of waste disposed and proof of disposal must be available at the site office. 				N/A
Nature of impact: Increased risk of veld fires.	Activity: Due to the presence of construction personnel in natural areas, fires can occur if not managed to the correct standard. Fire may occur due to the presence and use of hazardous and flammable materials on site.				No construction phase impacts are associated with the no-go alternative thus no assessment has been undertaken.
Significance rating:	MH	L	-	-	-

Planning, design, and construction phase	Layout Alternative 1 (Preferred Layout)		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
Cumulative impact:	-	-	-	-	-
Proposed Mitigation:	<ul style="list-style-type: none"> The Contractor shall take all reasonable and precautionary steps to ensure that fires are not started as a consequence of the activities on site; Ensure the work site and the contractor's camp is equipped with adequate firefighting equipment. This includes at least rubber beaters when working in veldt areas, and at least one fire extinguisher of the appropriate type irrespective of the site; Workers must be adequately trained in the handling of firefighting equipment, and can include but not limited to: <ul style="list-style-type: none"> Regular fire prevention talks and drills; and, Posting of regular reminders to staff; No open fires are permitted anywhere on site; Do not store any fuel or chemicals under trees; Do not store gas and liquid fuel in the same storage area (Hazardous substances to be stored in accordance with SANS); Any fires that occur on site shall be reported to the ECO immediately and then to the relevant Authorities; In the event of a fire, the Contractor shall immediately employ such plant and personnel as is at his disposal and take all necessary action to prevent the spread of the fire and bring it under control; Do not permit any smoking within 3 m of any fuel or chemical storage area, or refuelling area. A designated smoking area must be established on site; and, All construction vehicles must be fitted with at least one fire extinguisher. 				N/A
Nature of impact: Traffic impacts associated with the movement of construction vehicles on site.	Activity: The movement of vehicles on site may result in the destruction of biodiversity, compaction of valuable topsoil and mortalities of fauna on site.				No construction phase impacts are associated with the no-go alternative thus no assessment has been undertaken.
Significance rating:	M	L	-	-	-
Cumulative impact:	-	-	-	-	-
Proposed Mitigation:	<ul style="list-style-type: none"> During construction create designated turning areas and strictly prohibit any off-road driving or parking of vehicles and machinery outside designated areas; 				N/A

Planning, design, and construction phase	Layout Alternative 1 (Preferred Layout)		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
	<ul style="list-style-type: none"> Monitor the establishment of (Alien) Invasive Species and remove as soon as detected, before regenerative material can be formed; Abnormal loads and machinery should avoid movement over gravel roads during and immediately after rainfall events, to limit destruction of road surfaces and sedimentation of downhill rivers/streams; All vehicles must be road-worthy, be maintained to prevent fuel or oil leaks and drivers are to be licensed appropriately for the driving of their assigned vehicle. Drivers responsible for the transportation of personnel must be specifically licensed to do so; Construction vehicles may not leave the designated roads and tracks, whilst U-Turns are prohibited on all roads; Signage is always to be placed on vehicles; Any damage to public roads is to be reported to the management authority and repaired to its original condition; All construction vehicles must adhere to construction sites and avoid off road to minimise impact on vegetation and soil; After decommissioning, if access roads or portions thereof will not be of further use to the landowner, remove all foreign material and rip area to facilitate the establishment of vegetation, followed by a suitable revegetation program; and, Construction-related vehicles and machinery may not operate on site without reflective safety signage, car-top lights, and reflective personnel gear. 				
Nature of impact: Traffic impacts associated with the movement of construction vehicle.	Activity: The movement of vehicles in the vicinity of the construction site may cause damage to road surfaces as well as increase in the traffic volume of Route (R504).				No construction phase impacts are associated with the no-go alternative thus no assessment has been undertaken.
Significance rating:	L	L	-	-	-
Cumulative impact:	L	L	-	-	-
Proposed Mitigation:	<ul style="list-style-type: none"> Abnormal loads must be timed to avoid times of year when traffic volumes are likely to be higher, as would be expected over national holidays, weekends, and school holiday periods; Vehicles used for transport of materials and sand must be fitted with tarpaulins to prevent the release of such material or items onto road surfaces; Any damage to public roads is to be reported to the management Authority and repaired to its original condition; Transport of materials should be limited to the least number of trips possible; and, 				N/A

Planning, design, and construction phase	Layout Alternative 1 (Preferred Layout)		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
	<ul style="list-style-type: none"> Abnormal loads may not be transported after dark. 				

Planning, design, and construction phase	Layout Alternative 1 (Preferred Layout)		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
POTENTIAL IMPACTS ON BIOLOGICAL ASPECTS:					
Nature of impact: Direct impact on vegetation during construction and loss of species.	Activity: The construction of several permanent structures on site will result in the loss of vegetation due to foundation excavation.				No construction phase impacts are associated with the no-go alternative thus no assessment has been undertaken.
Significance rating:	M	L	-	-	-
Cumulative impact:	-	-	-	-	-
Proposed Mitigation:	<ul style="list-style-type: none"> No open fires are allowed on site during construction activities. Sufficient fire management equipment must be on the site. Smoking must be restricted to designated smoking areas. No dumping of sewage or hazardous waste into a terrestrial ecosystem. All activities must remain within the designated footprint. All areas outside of the footprint must be considered no-go areas. Development and access roads should be restricted to already disturbed areas as far as practically possible. Vehicles use must be restricted to designated roads. 				N/A
Nature of impact:	Activity:				No construction phase impacts are associated with the no-go alternative thus no assessment has been undertaken.

Planning, design, and construction phase	Layout Alternative 1 (Preferred Layout)		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
Dust nuisance generated by the operation of machinery and vehicles.	The construction activities of the proposed project could potentially result in fugitive dust emissions due to vegetation removal where dust could spread into the surrounding areas. The significance of this potential impact will likely; however, be only temporary.				
Significance rating:	M	L	-	-	-
Cumulative impact:	L	L	-	-	-
Proposed Mitigation:	<ul style="list-style-type: none"> Implement suitable dust management and prevention measures during the construction phase; Ensure all vehicles remain on designated roads and avoid the opening of detour or by-pass tracks; Vehicles delivering or removing soil must be covered to reduce spills and windblown dust; Any complaints received by the Contractor regarding dust will be recorded and communicated to the ECO; and, Areas around the proposed project footprint must be adequately rehabilitated to prevent significant dust emissions. 				N/A
Nature of impact: Fauna and Flora will be directly impacted as a result of construction activities and human presence at the site.	Activity: The construction of facilities will result in some habitat loss for resident fauna, as some species will occur within the affected areas. In addition, increased levels of noise, pollution, disturbance, and human presence during construction will be detrimental to resident fauna. Sensitive and shy fauna may move away from the area during the construction phase as a result of the noise and human activities present, while some slow-moving species (such as mole rats or blind snakes) would not be able to avoid the construction activities and might be killed.				No construction phase impacts are associated with the no-go alternative thus no assessment has been undertaken.
Significance rating:	M	L	-	-	-
Cumulative impact:	-	-	-	-	-
Proposed Mitigation:	<ul style="list-style-type: none"> No hunting, snaring, shooting, nest raiding or egg collection by the construction staff may be allowed; Holes and trenches must not be left open for extended periods of time and should only be dug when needed for immediate construction. Trenches that may stand open for some days should have places where the loose material has been returned to the trench to form an escape ramp present at regular intervals to allow any fauna that fall in to escape; Construction workers should be educated on sensitive species likely to be found in the area and posters should be put up of species of conservation concern. If any of these species are found during construction, they will be advised to contact the ECO immediately in order to prevent harm to these species and their habitats; 				N/A

Planning, design, and construction phase	Layout Alternative 1 (Preferred Layout)		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
	<ul style="list-style-type: none"> Keep the facility neat, tidy, and clean in order not to attract scavenging animals such as rats and mice; Ensure that the construction area is fenced off from adjacent areas which may harbour wild animals; Do not store building materials and excess stockpiled soils within riparian zones or within areas where natural vegetation occurs; and, Should any faunal species need to be translocated, a faunal or avifaunal (in the case of birds) specialist will need to be consulted. All personnel, during all phases of the project, must be inducted to ensure that they are aware of the environmental sensitivities on the site. No fauna may be caught, trapped, or harmed in any way. Clearance of vegetation should take place in phases (where practically possible), to increase the chances of smaller faunal species potential occurring in the development footprint, moving into the adjacent area. All staff must be trained to ensure that they are aware of any potential fauna may be on the footprint or surrounds. Vehicles must remain within a 30 km/h speed limit to avoid roadkill incidents. Any indigenous vegetation removed from the footprint should be scattered in adjacent area of recovering natural vegetation, to preserve potential microfauna and invertebrates found in amongst the vegetation. 				
Nature of impact: Spread and establishment of Alien and Invasive Species.	Activity: Soil disturbances from construction will enhance the encroachment of Alien and Invasive vegetation that will out compete indigenous counterpart species for resources, displace and reduce faunal and flora biodiversity. Clearing current Invasive Alien species will increase the risk of spreading species if not properly removed and safety transported.				No construction phase impacts are associated with the no-go alternative thus no assessment has been undertaken.
Significance rating:	M	L	-	-	-
Cumulative impact:	L	-	-	-	-
Proposed Mitigation:	<ul style="list-style-type: none"> Alien plant material removed during construction and eradication efforts should be contained and disposed of properly to limit accidental spread; Construction activities must be limited to the smallest possible area; Designated authorised service roads must be used by all Construction Vehicles; and, Alien Invasive Species (AIS) proliferation, which may affect adjacent natural habitat within surrounding areas, needs to be strictly managed adjacent to the footprint area. 				N/A

Planning, design, and construction phase	Layout Alternative 1 (Preferred Layout)		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
	<ul style="list-style-type: none"> Construction activities should be limited to the smallest possible area. Construction vehicles should use existing authorised service roads. Implement suitable alien invasive species establishment prevention measures during the construction phase such as proper storage, transport and disposal of plant material and minimising disturbance to the areas surrounding the development footprint. Alien invasive vegetation material cleared during construction activities must be adequately contained and disposed of at a suitable, certified 'green waste' disposal site to prevent further spreading. Areas around the proposed project footprint must be adequately rehabilitated to prevent significant alien invasive species establishment. Herbicides must be used in the prescribed quantities and only periods of no rainfall. 				
Nature of impact: Water quality of run-off water.	Activity: The Wetland and Harts River can potentially be at risk to increased surface runoff due to change in surface texture and effluent from the proposed development.				No construction phase impacts are associated with the no-go alternative thus no assessment has been undertaken.
Significance rating:	M	L	-	-	-
Cumulative impact:	L	L	-	-	-
Proposed Mitigation:	<ul style="list-style-type: none"> All rubble and litter should be cleared from the site and stored in designated waste bins and/or stockpile areas respectively. Strict waste management should be implemented during construction. Sufficient waste receptacles should be placed around the facility to encourage people to use them. The principle of reduce, re-use and recycle should be followed. Construction site should be kept clean and tidy. Any waste should be disposed in a registered landfill and not be allowed to be dumped in the surrounding landscape. No dumping of waste or any other materials is allowed within any stormwater channels, drainage lines or the watercourses. Storage of material, waste, spoil, and construction equipment on or in stormwater drainage or inside of demarcated protected areas – is strictly prohibited. All surfaces used for waste storage should have an impermeable surface. Drip trays to be placed beneath stationary vehicles and generators. 				N/A

Planning, design, and construction phase	Layout Alternative 1 (Preferred Layout)		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
	<ul style="list-style-type: none"> • Machinery should be maintained and inspected for leaks. All hazardous chemicals should be handled and stored on impermeable surfaces. • Hazardous chemicals should be kept on an impermeable bund area. • Stormwater and run-off should be managed and diverted to not be in contact with waste. • Regularly inspect all construction vehicles for leaks. Re-fuelling of vehicles must take place on a sealed surface area surrounded by berms to prevent ingress of hydrocarbons into topsoil. • If any spills occur, they should be immediately cleaned up. • An emergency response plan should be available for any chemical spill or ecological damage. • Spill kits and material safety data sheets must be stored on site: In case of accidental spills of oil, petroleum products etc., good oil absorbent materials must be on hand to allow for the quick remediation of the spill. The kits should also be well marked, and all personnel should be educated to deal with the spill. Vehicles must be kept in good working order and leaks must be fixed immediately on an oil absorbent mat. The use of a product such as Sunisorb is advised. • Proper toilet facilities must be available during constructional. Chemical toilets must be provided which should always be well serviced and spaced as per occupational health and safety laws and placed outside the 1:100-year flood lines. • No dirty water runoff from the construction and decommissioning site must be permitted to reach the watercourses around the proposed site. • Construction activities should be limited to the smallest possible area. • Construction vehicles should use existing roads. • Personnel must remain outside of delineated watercourses, unless required for authorised activities. Any work ins watercourses should be subject to a method statement; • Method Statements must be compiled for the following activities: <ul style="list-style-type: none"> ○ Handling of general waste ○ Handling of hazardous waste ○ Trenching within watercourses • An effective stormwater management plan must be compiled to ensure effective stormwater drainage. • The development footprint must remain as small as practically possible. • All buffers as stated in the Aquatic Compliance Statement must be adhered to. • All bare areas must be rehabilitated via a Revegetation Method Statement 				

Planning, design, and construction phase	Layout Alternative 1 (Preferred Layout)		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
POTENTIAL IMPACTS ON SOCIO-ECONOMIC ASPECTS:					
Nature of impact: Occupational Health and Safety.	Activity: During the construction phase, accidents, occupational diseases, ill health, and damage to property can occur if pre-cautionary measures are not taken. Increased movement of vehicles may lead to increased accidents among local communities, construction workers and vehicle operators.				No construction phase impacts are associated with the no-go alternative thus no assessment has been undertaken.
Significance rating:	MH	M	-	-	-
Cumulative impact:	-	-	-	-	-
Proposed Mitigation:	<ul style="list-style-type: none"> • Ensure that PPE is available to Personnel; • Adhere to the Occupational Health and Safety Act; • Keep the first aid kit stocked; • Issue all workers with necessary health and safety items; • Potentially hazardous areas must be demarcated with danger tape; • Appropriate signage must be placed to caution Employees and contractors not to enter certain structures without Authorisation; • Regular safety inspections must be conducted to ensure that participants are equipped with necessary safety equipment; and, • All construction personnel to wear hard hats and reflector jackets at all times. 				N/A
Nature of impact: Construction activities may have a positive impact on the local and regional socio-economic conditions.	Activity: During the construction phase of the project the construction process may have a positive impact on the local and regional socio-economic conditions by means of employment creation.				The proposed development will not take place and as such no socio-economic benefits will be derived from this construction period. The impact will thus be a negative one.
Significance rating:	L+	-	-	-	L

Planning, design, and construction phase	Layout Alternative 1 (Preferred Layout)		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
Cumulative impact:	-	-	-	-	-
Proposed Mitigation:	<ul style="list-style-type: none"> Where reasonable and practical the contractors appointed by the proponent should appoint local contractors and implement a “Local First” policy, especially for semi and low-skilled job categories; Where feasible, efforts should be made to employ Local Contractors that are compliant with Broad Based Black Economic Empowerment (BBBEE) criteria; Trench bedding material (sand) should be sought locally; Prior to construction phase the proponent and its Contractors should meet with representatives from the Local Municipality to establish the existence of a skills database for the area. If such a database exists it should be made available to the Contractors appointed for the construction phase; and, The recruitment selection process should seek to promote gender equality and the employment of women where possible, particularly for less labour-intensive work such as supervision. 				N/A

Planning, design, and construction phase	Layout Alternative 1 (Preferred Layout)		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
POTENTIAL IMPACTS ON CULTURAL-HISTORICAL ASPECTS:					
Nature of impact: Damage and destruction of vertebrate fossils during excavation activities.	Activity: Excavation activities can result in the discovery of cultural and historical artefacts beneath the earth surface. Damage or loss can occur if the correct procedures are not followed.				No construction phase impacts are associated with the no-go alternative thus no assessment has been undertaken.
Significance rating:	L	L	-	-	-
Cumulative impact:	-	-	-	-	-
Proposed Mitigation:	<ul style="list-style-type: none"> Should any heritage resources (including but not limited to fossil bones, coins, indigenous and/or colonial ceramics, any articles of value or antiquity, stone artefacts or bone remains, structures and other built features, rock art and rock engravings) be exposed during excavation for the purpose of construction, construction in the vicinity of the finding must be stopped. A 				N/A

Planning, design, and construction phase	Layout Alternative 1 (Preferred Layout)		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
	<p>trained Palaeontologist or Heritage Specialist must be notified to assess the finds, and this must then be reported to the South African National Resources Agency;</p> <ul style="list-style-type: none"> Heritage remains uncovered or disturbed during earthworks must not be disturbed further until the necessary approval has been obtained from the Heritage Authority. A registered Heritage Specialist must be called to the site for inspection and removal once authority to do so, has been given; Excavations must be limited to the footprint area and be maintained in a narrow corridor; All operations of excavation equipment must be made aware of the possibility of the occurrence of sub-surface heritage features and the following procedures must be followed: <ul style="list-style-type: none"> All construction in the immediate 50 m vicinity radius of the site must cease; The Heritage Practitioner must be informed as soon as possible; In the event of obvious human remains SAPS must be notified; Mitigation measures (such as refilling, etc.) must not be attempted; The area in a 50 m radius of the find must be cordoned off with hazard tape; and, Public access must be limited, and the area must be placed under guard. 				

Planning, design, and construction phase	Layout Alternative 1 (Preferred Layout)		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
POTENTIAL VISUAL IMPACTS:					
Nature of impact: Impact on the sense of place for surrounding users.	Activity: The movement of construction vehicles, machinery and personnel on site shall result in a visual impact on surrounding users. Furthermore, to this, the storage of materials and excavation shall result in disturbance and an unsightly character.				No construction phase impacts are associated with the no-go alternative thus no assessment has been undertaken.
Significance rating:	M	L	-	-	-
Cumulative impact:	L	-	-	-	-

Planning, design, and construction phase	Layout Alternative 1 (Preferred Layout)		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
Proposed Mitigation:	<ul style="list-style-type: none"> • Access roads are to be kept clean and dust suppression techniques should be implemented to minimise impacts of vehicle movement; • Site offices and structures should be limited to one location and carefully situated to reduce visual intrusions. • Construction camps as well as development areas must be screened with netting; • Lights within the construction camp must face directly down (angle of 180°); • Minimum vegetation may be removed to ensure the visual absorption capacity remain high; • Litter should be strictly controlled, as the spread thereof through wind could have a very negative visual impact; and, • Avoid shiny materials in structures. Where possible shiny metal structures should be darkened or screened to prevent glare. 				N/A

Planning, design, and construction phase	Layout Alternative 1 (Preferred Layout)		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
POTENTIAL IMPACTS ON NOISE ASPECTS:					
Nature of impact: Noise nuisance generated by construction works, vehicles and personnel.	Activity: The operating of vehicles and machinery on site results in the generation of noise disturbing users of the surrounding area.				No construction phase impacts are associated with the no-go alternative thus no assessment has been undertaken.
Significance rating:	MH	L	-	-	-
Cumulative impact:	L	-	-	-	-
Proposed Mitigation:	<ul style="list-style-type: none"> • Should multiple activities result in the excessive generation of noise, it must be strived to coordinate the incidence of these at the same time; • Fit machinery with silencers; • All stationary noisy equipment such as compressors and pumps must be contained behind acoustic covers, screens, or sheds where possible; • The regular inspection and maintenance of equipment must be undertaken to ensure that all components function optimally; 				N/A

Planning, design, and construction phase	Layout Alternative 1 (Preferred Layout)		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
	<ul style="list-style-type: none"> • Vehicles must avoid the use of their reverse gear as far as possible to avoid the sounding of sirens. This must not be considered for temporary access routes as disturbance of adjacent vegetation is to be avoided; • Where recurrent use of machinery is frequent, machines must be shut down during intermediate periods; • Unless otherwise specified by the DEO, normal working hours will apply (i.e., from 07H00–18H00, Mondays to Fridays); • No loud music is permitted on site or in the Camp; • Ensure that Employees and staff conduct themselves in an acceptable manner while on site, both during working hours and after hours; and, • Vehicles are to abide by speed restrictions on access roads and limit trip generation to minimise disturbance to surrounding land users. 				

4.3 POTENTIAL OPERATIONAL PHASE IMPACTS

Operational Phase	Layout Alternative 1 (Preferred Layout)		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
POTENTIAL IMPACTS ON GEOGRAPHICAL, GEOLOGICAL AND PHYSICAL ASPECTS:					
Nature of impact: Handling of general waste materials on the development site.	Activity: Waste will be generated on site, if not disposed of correctly it will become a nuisance within the area.				No operational phase impacts are associated with the no-go alternative thus no assessment has been undertaken.
Significance rating:	M	L	-	-	-
Cumulative impact:	-	-	-	-	-
Proposed Mitigation:	<ul style="list-style-type: none"> Waste must not be stored on site in excess of ninety (90) days; All general waste must be disposed of at a registered landfill site as mentioned in the Basic Assessment Report; An adequate number of scavenger proof litter bins are to be placed throughout the site. Two (2) waste bins at least must be present, one (1) for hazardous waste and one (1) for non-hazardous waste at each working site. Dumping of waste on site is prohibited; Waste sorting and separation must form part of the environmental induction and awareness programme, to encourage personnel to collect wastepaper, glass, and metal waste separately; Keep all work sites including storage areas, offices, and workshops neat and tidy; Dedicate a demarcated and signposted storage area on site for the collection of waste; All domestic waste is to be removed from site and disposed of at a registered solid waste landfill site as mentioned in the Basic Assessment Report; Care must be taken to ensure that no waste fall off disposal vehicles on-route to the landfill. If needed, a tarpaulin can be utilised; The burning or burying of solid waste on site is prohibited. Do not burn PVC pipes or other plastic materials, as this is regarded as hazardous waste; Littering by personnel shall not be permitted; General refuse/rubbish shall be removed from site on a weekly basis to an approved registered landfill site or as soon as the waste bins are reaching full capacity; Minimise waste by sorting wastes into recyclable and non-recyclable waste; 				N/A

Operational Phase	Layout Alternative 1 (Preferred Layout)		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
	<ul style="list-style-type: none"> Hazardous waste must be sorted from non-hazardous waste and disposed of at a hazardous treatment facility, records and proof of disposal must be kept; and, A register must be kept of the quantities of waste disposed and proof of disposal must be available at the site office. 				
Nature of impact: Traffic impacts associated with the movement of vehicles within the area.	Activity: The regular movement of vehicles on the R504 and within the area would increase traffic flow and impede vehicle movement.				No operational phase impacts are associated with the no-go alternative thus no assessment has been undertaken.
Significance rating:	L	L	-	-	-
Cumulative impact:	L	L	-	-	-
Proposed Mitigation:	<ul style="list-style-type: none"> All speed limits need to be adhered to; Abnormal loads must be timed to avoid times of year when traffic volumes are likely to be higher, as would be expected over national holidays, weekends, and school holiday periods; Any damage to public roads is to be reported to the management Authority and repaired to its original condition; and, Abnormal loads may not be transported after dark. 				N/A
Nature of impact: Infiltration of effluent and chemicals that have the potential to change the quality of the groundwater. Discharge of treated effluent into the Harts River.	Activity: Potential of leachate from the sewage treatment plant to pollute the groundwater by changing the quality of the groundwater. Discharge of treated effluent which do not comply to DWS standards can cause detrimental effects on both the ecological/watercourse and human health.				The pollution of groundwater can cause the proposed oxidation pond's environmental authorisation and associated licenses to be reviewed with associated penalties.
Significance rating:	H	M	-	-	-
Cumulative impact:	-	-	-	-	-

Operational Phase	Layout Alternative 1 (Preferred Layout)		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
Proposed Mitigation:	<ul style="list-style-type: none"> • Groundwater monitoring to prevent groundwater contamination, through means of prevention when detected early enough. • The facility should be kept clean and tidy at all times. • Any waste generated should be disposed of accordingly in registered waste (landfill) sites and not dumped on site or the surrounding area. • All surfaces that are associated with waste should have impermeable surfaces. • Stormwater and runoff should be diverted and managed to not come in contact with any waste generated on site. • Operation of the plant should be managed to prevent overflow and spillage. • The integrity of pipes and associated infrastructure should be inspected and upgraded as needed. • All spills must immediately be cleaned up and disposed of at a registered landfill site. • The effluent water which will be treated from the oxidation pond should be tested regularly to ensure that it complies to SANS standards as recommended by DWS prior to being discharged into the receiving watercourse. The surface water quality downstream and upstream of the proposed oxidation pond should be monitored on a monthly basis by a qualified Hydrogeological Specialist to ensure that contamination does not occur from the proposed activity. • At least two (2) monitoring boreholes, one (1) upstream from the facility and the other downstream of the facility, should be drilled on site to ensure that leakage from the treatment plant does not occur which will aid as an early detection tool; and, • The groundwater quality should be assessed bi-annually by an accredited laboratory and distributed to the relevant authority on compliance during the operation of the facility. 				N/A
Nature of impact: Infiltration of effluent and chemicals that have the potential to change the quality of the groundwater.	<p>Activity:</p> <p>Considering the site-specific properties such as:</p> <ul style="list-style-type: none"> • Recharge (low); • Rainfall (low rainfall MAP: 426 mm); • Temperature (high annual temperature of 17.90 °C – High evaporation); • Topography and drainage (drainage towards topographical depression – Harts River, however, will rather evaporate than run-off); • Water table (water table of 15.35 mbgl.); • Minor fractured, weathered aquifer (high permeability); • Groundwater vulnerability (very low - low), and, • Groundwater quality (good drinking water quality (EC Values) – high salinity). 				The pollution of groundwater can cause the proposed oxidation pond's environmental authorisation and associated licenses to be reviewed with associated penalties.
Significance rating:	L	L	-	-	
Cumulative impact:	-	-	-	-	

Operational Phase	Layout Alternative 1 (Preferred Layout)		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
Proposed Mitigation:	<ul style="list-style-type: none"> • Groundwater monitoring to prevent groundwater contamination, through means of prevention when detected early enough. • The facility should be kept clean and tidy at all times. • Any waste generated should be disposed of accordingly in registered waste (landfill) sites and not dumped on site or the surrounding area. • All surfaces that are associated with waste should have impermeable surfaces. • Operation of the plant should be managed to prevent overflow and spillage. • The integrity of pipes and associated infrastructure should be inspected and upgraded as needed. 				N/A
Nature of impact: Increased risk of veld fires.	Activity: Due to the presence of personnel in natural areas, fires can occur if not managed to the correct standard.				No operational phase impacts are associated with the no-go alternative thus no assessment has been undertaken.
Significance rating:	M	L	-	-	
Cumulative impact:	-	-	-	-	
Proposed Mitigation:	<ul style="list-style-type: none"> • The Applicant shall take all reasonable and precautionary steps to ensure that fires are not started due to the activities on site; • Ensure the work site is equipped with adequate firefighting equipment. This includes at least rubber beaters when working in veldt areas, and at least one fire extinguisher of the appropriate type irrespective of the site; • Workers must be adequately trained in the handling of firefighting equipment, and can include but not limited to: <ul style="list-style-type: none"> ○ Regular fire prevention talks and drills; and, ○ Posting of regular reminders to staff; • No open fires are permitted anywhere on site; • Do not store any fuel or chemicals under trees; • Do not store gas and liquid fuel in the same storage area (Hazardous substances to be stored in accordance with SANS); • Any fires that occur on site shall be reported to the ECO immediately and then to the relevant Authorities; • In the event of a fire, the Contractor shall immediately employ such plant and personnel as is at his disposal and take all necessary action to prevent the spread of the fire and bring it under control; • Do not permit any smoking within 3m of any fuel or chemical storage area, or refuelling area. A designated smoking area must be established on site; and, • All maintenance vehicles must be fitted with at least one fire extinguisher. 				N/A

Operational Phase	Layout Alternative 1 (Preferred Layout)		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
Nature of impact: Water quality changes due to operations of the oxidation ponds	Activity: The general operation of the oxidation ponds and pipelines may result in seepage of untreated sewage and effluent into surrounding freshwater systems.				No operational phase impacts are associated with the no-go alternative thus no assessment has been undertaken.
Significance rating:	M	L	-	-	-
Cumulative impact:	-	-	-	-	-
Proposed Mitigation:	<ul style="list-style-type: none"> An effective maintenance plan must be compiled and approved by the Department of Water and Sanitation (DWS). Any spillage or seepage incidents must be immediately reported. These reports must be submitted to the DEDECT and DWS. Regular effluent monitoring must take place to ensure that the treatment system is effective. 				N/A
Nature of impact: General operation of oxidation ponds	Activity: The general operation of the oxidation ponds may result in improper stormwater management and alien invasive species establishment.				No operational phase impacts are associated with the no-go alternative thus no assessment has been undertaken.
Significance rating:	M	L	-	-	-
Cumulative impact:	-	-	-	-	-
Proposed Mitigation:	<ul style="list-style-type: none"> Structures must be inspected regularly for the accumulation of debris, blockages, instabilities, and erosion with concomitant remedial and maintenance actions. Regular inspections will be undertaken of any access roads and stormwater management drains for signs of erosion and sedimentation. Ongoing alien vegetation removal should take in and around the development footprint. Operational site should be kept clean and tidy. Vehicles should be restricted to travelling only on designated roadways to limit the ecological footprint of the proposed development activities. No dumping of waste or any other materials is allowed within the watercourses or their regulated areas. If any spills occur, they should be immediately cleaned up. 				N/A

Operational Phase	Layout Alternative 1 (Preferred Layout)		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	

POTENTIAL IMPACTS ON SOCIO-ECONOMIC ASPECTS:					
Nature of impact: Oxidation Pond System.	Activity: The construction of the Oxidation Pond and two gravity outfall sewer lines will treat wastewater and reduce the discharge of contaminants and pathogens into the environment.				No operational phase impacts are associated with the no-go alternative thus no assessment has been undertaken.
Significance rating:	MH (+)	-	-	-	-
Cumulative impact:	-	-	-	-	-
Proposed Mitigation:	<ul style="list-style-type: none"> Mitigation measures are not applicable as the impact is positive. 				N/A

Please refer to Appendix F for the full Impact Assessment.

4.4 ENVIRONMENTAL IMPACT STATEMENT

During the construction phase most impacts have a moderate impact rating prior to mitigation; however, if all mitigation measures are adhered to these impacts will have a low impact rating. The highest pre-mitigation impact will be the removal of topsoil and soil erosion, the occurrence of veld fires and noise nuisance generated by construction works all have a pre mitigation impact of medium-high . If all mitigation measures are implemented on site, the occurrence of veld fires, removal of topsoil and soil erosion and noise nuisance generated by construction works will have a low impact rating. It must be noted that one (1) positive impact will occur in the form of job creation during the construction phase. The employment opportunities will be temporary; however, it will provide some relief in a remote area.

During the operational phase the highest pre-mitigation impact will be the infiltration of effluent and chemicals that have the potential to change the quality of the groundwater and the discharge of treated effluent into the Harts River. If all mitigation measures are implemented on site, the occurrence of effluent and chemicals infiltrating and changing the quality of groundwater will have a medium impact. All other impacts pre-mitigation will be moderate; however, all these impacts can be mitigated to a low impact rating. It must be noted that a moderately high positive impact will occur due to the treatment of wastewater and reducing the discharge of contaminants and pathogens into the environment.

4.5 GAPS IN KNOWLEDGE

The EIA process is being undertaken prior to the availing of certain information which would be derived from the project design and feasibility studies. As such, technical aspects included herein derive from a range of sources including pre-feasibility engineering and through personal communication with the design team. Given that the EIA process is one of several investigations being done, milestones and key outputs for each of these may not always be available for interrogation into the EIA process. As such, the DEDECT and other commenting and decision-making Authorities are required to generate their decision based on the information available to the study at the time, whilst measures can be adopted to manage any changes as conditions within decisions are made.

Enviroworks is an independent environmental consulting firm and as such, all processes and attributes of the EIA are addressed in a fair and unbiased fashion. It is believed that through the running of a transparent and participatory process, risk associated with assumptions, uncertainties and gaps in knowledge can be, and were, minimised.

4.6 ASSUMPTIONS

The following assumptions can be made:

- All information provided by the Applicant (Dr. Ruth Segomotsi Mompoti District Municipality) and the engineering team to the EAP was correct and valid at the time it was provided;
- The public will receive a fair and recurring opportunity to participate in the EIA process, through the provision of Public Participation timeframes stipulated in the Regulations;

- The need and desirability were based on strategic national, provincial, and local plans and policies which reflect the interests of both statutory and public viewpoints;
- The EIA process is a project-level framework and is limited to assessing the environmental impacts associated with the project phases of the activity being applied for only; and,
- Strategic level decision making is achieved through co-operative governance with sustainable development principles underpinning all decision-making.

4.7 UNCERTAINTIES

Given that an EIA involves prediction, uncertainty forms an integral part of the process. Two types of uncertainty are associated with the EIA process, namely process-related and prediction related. The FAO (2010) cites types of uncertainty as discussed by De Jongh in Wathern. These are summarised as follow:

- **Uncertainty of prediction** is critical at the data collection phase as final certainty will only be resolved on implementation of the activity being applied for;
- **Uncertainty of values** depicts the approach assumed during the EIA process, while final certainty will be determined at the time decisions are made. Enhanced communications and widespread co-ordinations can lower uncertainty; and,
- **Uncertainty of related decisions** relates to the decision-making aspect of the EIA process, which shall be appeased once monitoring of the project phase is undertaken (Dougherty and Hall, 1995).

The FAO (2010) further stresses the significance of widespread consultation towards minimising the risk of omitting significant impacts. The use of quantitative impact significance rating formulas can further limit the occurrence and scale of uncertainty.

5 SECTION E: CONCLUSIONS AND RECOMMENDATIONS OF PRACTITIONER

The following recommendation have been made by the EAP:

Construction Phase

- Disturbed areas should be rehabilitated as soon as possible after the construction period;
- No open fires are to be allowed on site;
- Designated smoking areas must be marked on site;
- All applicable mitigation measures recommended by the various Specialists should be strictly implemented; and,
- The EMPr should be approved by the DEDECT prior to construction and its implementation should form part of the conditions of the Environmental Authorisation.

Operational Phase

- The facility's compliance with the EMPr should be monitored intermittently during the operational phase of the project;
- No open fires are to be allowed on site. Fires must only be allowed in designated areas;
- Designated smoking areas must be marked on site;
- All applicable mitigation measures recommended by the various Specialists should be strictly implemented; and,
- The EMPr should be approved by the DEDECT prior to construction and its implementation should form part of the conditions of the Environmental Authorisation.

According to the Plant Species, Animal Species and Terrestrial Biodiversity Theme Compliance Statement it is anticipated that the oxidation ponds and sewage outflow will have negligible impact on the biodiversity, fauna and botanical features identified by the Screening Tool as most of the footprint is disturbed and degraded and does not contribute significantly to the overall ecological functioning and biodiversity of the area. Most of the indigenous species identified on the footprint are non-threatened and non-protected. Any fauna species that utilised the area are expected to be common to the wider and non-threatened and not protected. Should any faunal species have been impacted, individuals would have likely been able to find refuge in the surrounding open space.

Taking into consideration the expected sensitivity of the footprint, sensitive features identified by the Screening Tool, the results from the expected baseline biodiversity and ecosystem of the site, which was verified by a site visit, it can be concluded that the footprint is of **low sensitivity** for the Plant Species, Animal Species and Terrestrial Biodiversity Theme. Provided that all the management outcomes are adhered to, this Compliance

Statement is considered sufficient to meet the requirements for authorisation under the Plant Species, Animal Species and Terrestrial Biodiversity Theme Minimum requirements.

According to the Aquatic Biodiversity Theme Compliance Statement and taking into consideration the sensitivity of the development footprint, sensitive features identified by the Screening Tool, the results from the baseline biodiversity and ecosystem of the site, which was verified by a site visit, it can be concluded that the proposed development footprint is of **low** sensitivity for the Aquatic Biodiversity Theme. Provided that all the management outcomes are adhered to, this Compliance Statement is considered sufficient to meet the requirements for authorisation under the Aquatic Biodiversity Theme Minimum requirements.

According to the Agricultural Compliance Statement due to the medium sensitivity and lack of current agricultural activity, it is the specialist's opinion that the proposed development will not have a significant impact on agricultural in the area. In terms of agricultural sensitivity, the proposed development should thus be allowed to proceed at the identified site.

According to the Heritage and Palaeontological Compliance Statement given the extremely small footprint of proposed construction of the Oxidation Pond and sewer lines and the highly disturbed ground that has already been heavily impacted by urbanisation and farming, it is unlikely that any significant archaeological heritage resources will be found for this development. However, the proposed route of the pipeline falls within an existing path around a cemetery serving the community of Ipelegeng in Schweizer-Reneke. It is clear that the proposed development may well impact on modern graves and the route and excavation work will have to be carefully done to avoid impacts on any graves, however this is not a heritage concern as these graves are modern.

According to the Geohydrological Impact Assessment the proposed Oxidation Pond and two (2) gravity outfall sewer lines, poses an overall low risk in terms of groundwater contamination potential and a high risk in surface water contamination potential; however, risks can be decreased by taking the recommendations and mitigation measures mentioned in the Geohydrological Impact Assessment Report into account.

Following a thorough investigation, the EAP found that from an environmental perspective the Preferred Alternative will have an acceptable impact with the implementation of mitigation measures, and as such it is recommended that the Preferred Alternative be approved.

6 SECTION F: APPENDICES

- Appendix A - Maps of the Study Area;
- Appendix B - Photographs of the Study Area;
- Appendix C - Facility Illustration of the Proposed Development;
- Appendix D - Specialist Reports;
- Appendix E - Public Participation Process Report;
- Appendix F - Impact Assessment;
- Appendix G - Environmental Management Programme;
- Appendix H - Details of the Environmental Assessment Practitioner;
- Appendix I - Specialist Declaration; and,
- Appendix J - Additional Information.

7 REFERENCES

Bouwer, D. 2022. Compliance Statement for the Proposed Construction of the Ipelegeng Oxidation Pond and Two Gravity Outfall Sewer Lines. Digital Soils Africa (Pty) Ltd.

Coetzee, F. 2017. Cultural Heritage Impact Assessment: Phase 1 Investigation of the Locklore Boerdery (Pty) Ltd, Schweizer-Reneke, Mamusa Local Municipality, Dr Ruth Segomotsi Mompati District Municipality, North West Province. NID: 167803

Lavin, J. 2022. Heritage Screener for the Basic Assessment Process for the the Proposed Construction of an Oxidation Pond System and Two Gravity Outfall Sewer Lines near Schweizer-Reneke, North West Province. CTS Heritage.

Lubbe, R. 2022. Geohydrological Impact Assessment for the Proposed Construction of an Oxidation Pond System and Two Gravity Outfall Sewer Lines, situated on Portion 1 of the farm Schweizer-Reneke town and Townlands-H, Schweizer-Reneke, North West Province. Enviroworks (PTY) Ltd.

Pelser, A. 2019. PHASE 1 HIA Report for the Existing Development Of A Diesel Depot On Portion 22 Of Mimosa 61ho & The Development Of A Mill On A Portion Of Grootpoort 83ho Near Schweizer-Reneken In The Mamusa Local Municipality, North-West Province - Apac019/58

Pelser, A. 2021. Report On A Phase 1 HIA For The Proposed Ipelegeng Extension 12 Township Establishment At Schweizer-Reneke In The Mamusa Local Municipality Of The Northwest Province

Smith, M. 2023. Aquatic Biodiversity Theme Compliance Statement and Section (c) and (i) Risk Matrix for the Proposed Construction of an Oxidation Pond System and Two Gravity Outfall Sewer Lines, situated on Portion 1 of the farm Schweizer-Reneke town and Townlands-H, Schweizer-Reneke, North West Province. Enviroworks (PTY) Ltd.

Smith, M. 2023. Plant Species, Animal Species Compliance Statement and Terrestrial Biodiversity Theme Compliance Statement for the Proposed Construction of an Oxidation Pond System and Two Gravity Outfall Sewer Lines, situated on Portion 1 of the farm Schweizer-Reneke town and Townlands-H, Schweizer-Reneke, North West Province. Enviroworks (PTY) Ltd.

2022/2027. Integrated Development Plan. Dr Ruth Segomotsi Mompati District Municipality.

Statistics South Africa. 2011. Mamusa. Department of Statistics South Africa.