



# LIMPOPO

PROVINCIAL GOVERNMENT  
REPUBLIC OF SOUTH AFRICA

## DEPARTMENT OF ECONOMIC DEVELOPMENT, ENVIRONMENT & TOURISM

### BASIC ASSESSMENT REPORT - EIA REGULATIONS, 2014

Basic Assessment report in terms of the Environmental Impact Assessment Regulations, 2014, promulgated in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended.

File Reference Number:

--

NEAS Reference Number:

Date Received:

Due date for acknowledgement:

Due date for acceptance:

Due date for decision

(For official use only)


Kindly note that:

1. The report must be compiled by an independent Environmental Assessment Practitioner.
2. The report must be typed within the spaces provided in the form. The size of the spaces provided is not necessarily indicative of the amount of information to be provided. The report is in the form of a table that can extend itself as each space is filled with typing.
3. Where applicable **tick** the boxes that are applicable in the report.
4. The use of "not applicable" in the report must be done with circumspection because if it is used in respect of material information that is required by the Department of Economic Development, Environment and Tourism as the competent authority (Department) for assessing the application, it may result in the rejection of the application as provided for in the regulations.
5. An incomplete report may be returned to the applicant for revision.
6. Unless protected by law, all information in the report will become public information on receipt by the department. Any interested and affected party should be provided with the information contained in this report on request, during any stage of the application process.

8. Regulations refer to Environmental Impact Assessment (EIA) Regulations of 2014.
9. The Department may require that for specified types of activities in defined situations only parts of this report need to be completed. No faxed or e-mailed reports will be accepted.
10. This application form must be handed in at the offices of the Department of Economic Development, Environment and Tourism:-

<p><b><u>Postal Address:</u></b>  Central Administration Office  Environmental Impact Management  P. O. Box 55464  <b>POLOKWANE</b>  0700</p>	<p><b><u>Physical Address:</u></b>  Central Administration Office  Environmental Affairs Building  20 Hans Van Rensburg Street / 19 Biccard  Street  <b>POLOKWANE</b>  0699</p>
<p><b>Queries should be directed to the Central Administration Office: Environmental Impact Management:-</b></p> <p><b>For attention:</b> Mr E. V. Maluleke  <b>Mobile:</b> 082 947 7755  <b>Email:</b> <a href="mailto:malulekeev@ledet.gov.za">malulekeev@ledet.gov.za</a></p>	

View the Department's website at <http://www.ledet.gov.za/> for the latest version of the documents.

## SECTION A: ACTIVITY INFORMATION

Has a specialist been consulted to assist with the completion of this section?

YES	NO
-----	----

If YES, please complete the form entitled “Details of specialist and declaration of interest” or appointment of a specialist for each specialist thus appointed:

Any specialist reports must be contained in Appendix D.

### 1. ACTIVITY DESCRIPTION

Describe the activity, which is being applied for, in detail:

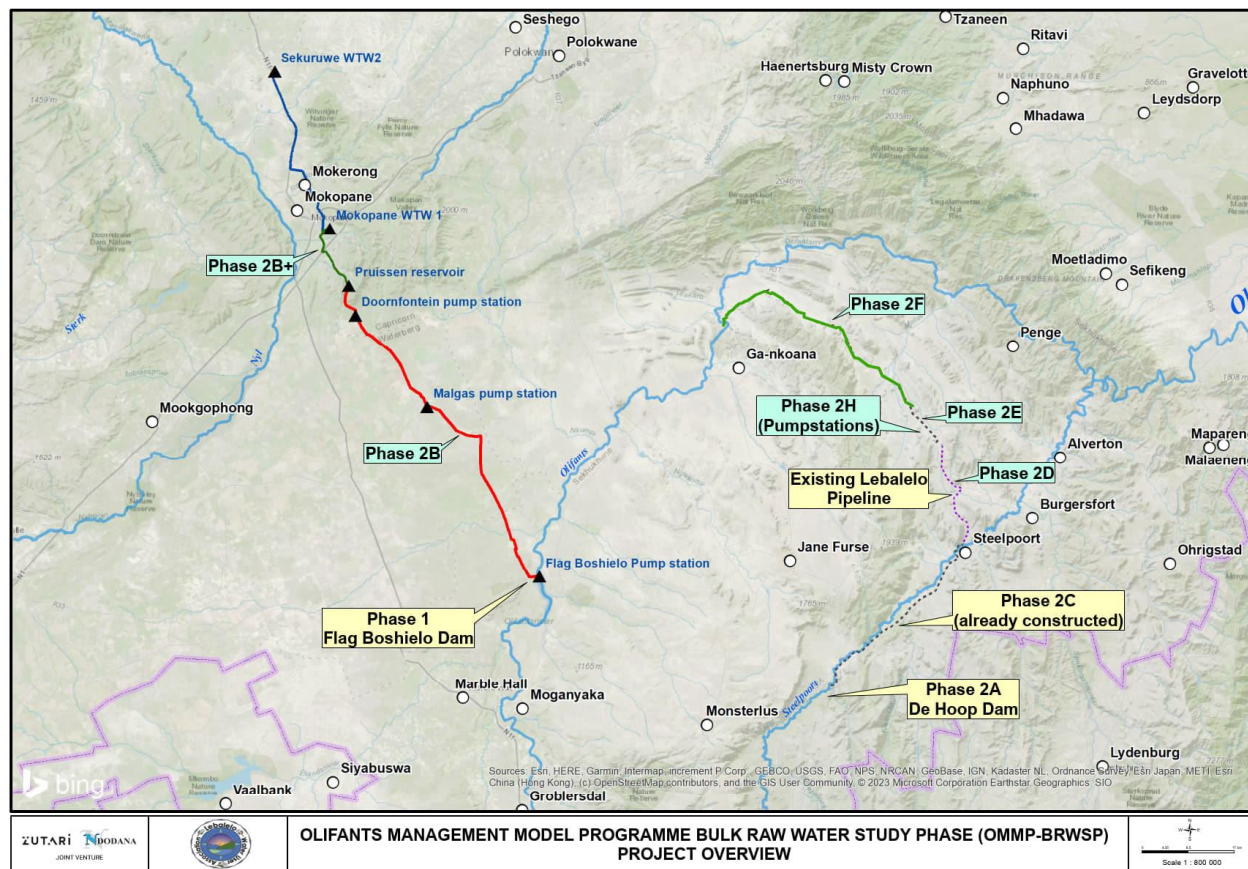
#### **BACKGROUND INFORMATION:**

The Zutari Ndodana Joint Venture (ZNJV)<sup>2</sup> was previously appointed by the Trans-Caledon Tunnel Authority (TCTA), on behalf of the Department of Water and Sanitation (DWS) for the provision of professional services for the Olifants River Water Resources Development Project – Phase 2 (ORWRDP-2). Initially the Project comprised of the following phases (refer to **Figure 1**):

- Phase 2A: Construction of De Hoop Dam
- Phase 2B: Pipeline from Flag Boshielo Dam to Pruisen near Mokopane (72km)
- Phase 2B+: New pipe for 2B extension, where existing raw water pipeline to Sekuruwe commences
- Phase 2C: Pipeline from De Hoop Dam to Mooihoek
- Phase 2D: Pipeline from Steelpoort to Mooihoek (24km)
- Phase 2E: Pipeline from Mooihoek to Havercroft Junction (14km)
- Phase 2F: Pipeline from Havercroft Junction to Olifantspoort (44km)
- Phase 2G: Possible second pipeline parallel to Phase 2B
- Phase 2H: Changes and additions to the current Phase 2H (Lebalelo Network); and
- Phase 2I: Pipeline from the De Hoop Dam to the proposed Eskom Tubatse Pump-storage Hydro-electric Scheme (this Phase has been cancelled).

<sup>1</sup> Please note that this description should not be a verbatim repetition of the listed activity as contained in the relevant Government Notice, but should be a brief description of activities to be undertaken as per the project description.

<sup>2</sup> Previously referred to as Aurecon



**Figure 1:** Map indicating the alignment of the different pipelines for the various Phases. The Northern Limb includes Phases 2B and 2B+ while the Eastern Limb consists of the phases in the east section of the project (i.e., Phases 2H, 2F, 2E and 2D).

The ORWRDP-2 has since been reconstituted to become the Olifants Management Model Programme Bulk Raw Water Study Phase (OMMP–BRWSP) in recent years, with the Lebalelo Water User Association (LWUA) acting as the implementing agent for the following portions of the project:

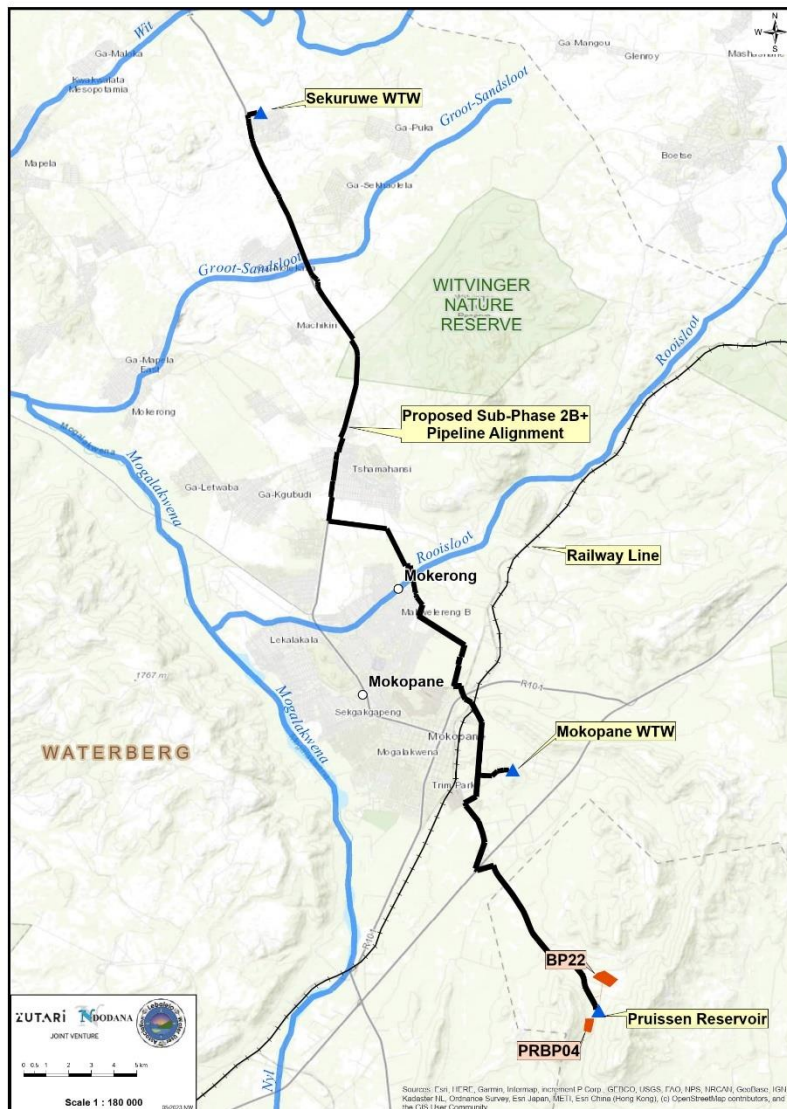
- Phase 2B
- Phase 2B+; and
- Phase 2F

LWUA, has appointed the ZNJV for the provision of professional services for the OMMP-BRWSP. The OMMP-BRWSP bulk infrastructure plan makes provision for the construction of raw water pipeline systems to the identified target areas. These bulk pipeline systems are now identified by their respective “Phase” number. The relevant bulk pipe that would augment raw water to the Mogalakwena system (i.e., for domestic and mine use) is the proposed Phase 2B pipeline. Phase 2B has been authorised by a revised Record of Decision (rRoD) (Ref: **12/12/20/553**) issued in 2006 in terms of the Environmental Conservation Act, (No. 73 of 1989) (ECA). The proposed Water Treatment Works (WTW) are located in two locations along the alignment of Phase 2B+. This phase is an extension of Phase 2B and spans from Pruisen reservoir to Piet-se-Kop. The gravity pipeline has been authorised by Environmental Authorisation (EA) (**12/19/1-W120**) and EA (**12/19/1-W131**). The OMMP-BRWSP bulk infrastructure plan makes provision for the construction of raw water pipeline systems to the identified target areas.



The Mogalakwena Local Municipality (MLM) is a Water Services Authority (WSA) as contemplated in the Water Services Act (No. 108 of 1997). Therefore, the municipality is responsible for the realisation of the right to access to basic water services: ensuring progressive realisation of the right to basic water services, subject to available resources (that is, extension of services), the provision of effective and efficient ongoing services (performance management, by laws) and sustainability (financial planning, tariffs, service level choices, environmental monitoring). The WSA has developed a Water Services Development Plan (WSDP) in conjunction with master plans for water and sanitation.

The planning for water and wastewater services in Mogalakwena culminated in the Mogalakwena Water Master Plan (MWMP). As part of the MWMP, two new WTWs are to be provided, namely a works serving the Mokopane Town with an ultimate capacity of 28 Ml/d and another servicing the areas north of Mokopane located near Sekuruwe Township with an ultimate design capacity of 21Ml/d (refer to **Figure 2**).



**Figure 2:** Map indicating the location of the proposed WTWs with respect to the alignment of Phase 2B+.

The technical features of the scheme proposed in the MWMP (for the ultimate scheme) include the following:

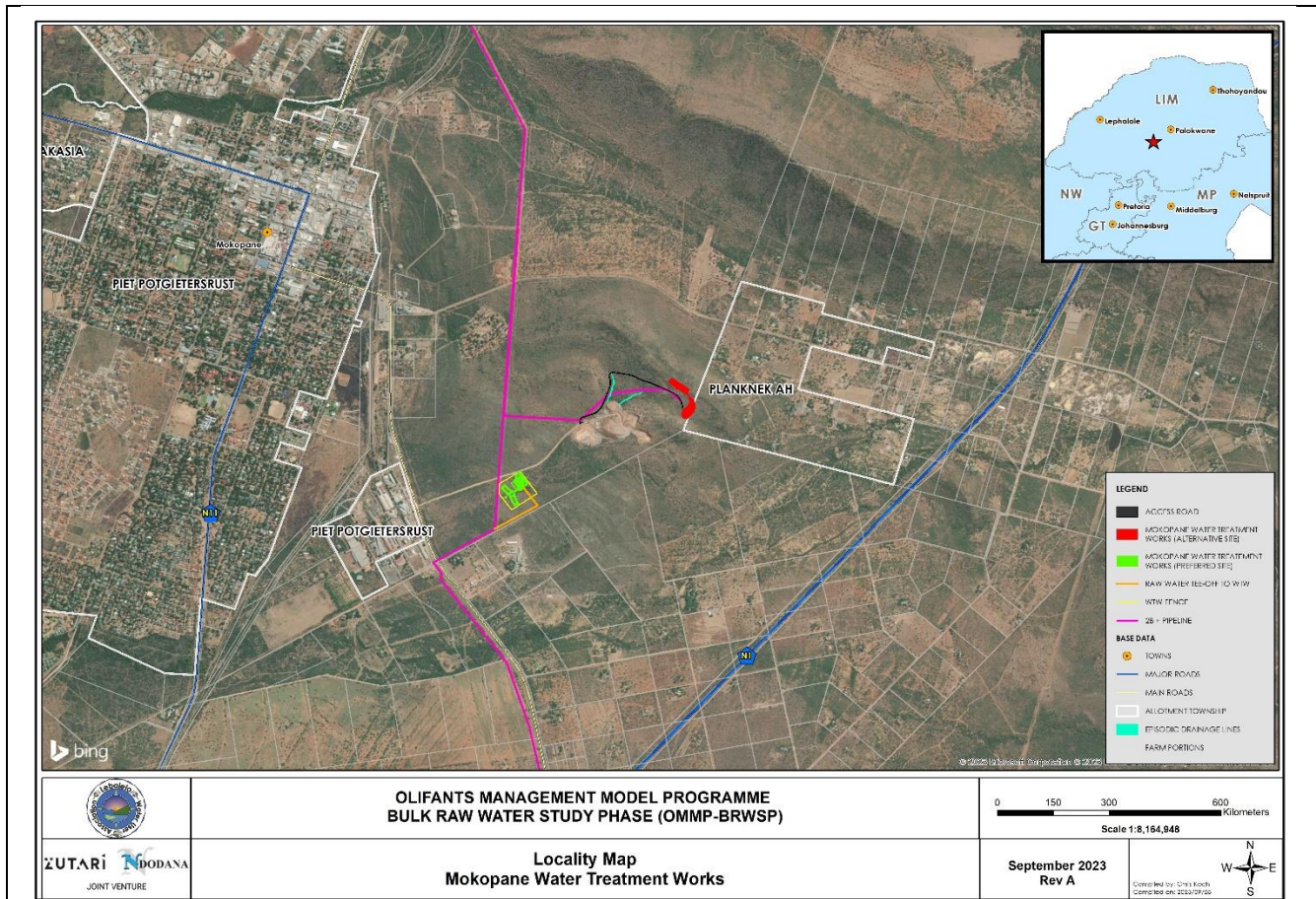
- A raw water pipe from the farm Pruisen (where it connects to the bulk water pipeline from Flag Boshielo Dam) to a new WTW (the Mokopane WTW). This works will supply potable water to Mokopane Central Business District (CBD) and town areas.

- The raw water pipe will continue from the WTW at Mokopane, northwards to the rural town area of Sekuruwe. At this point a second WTW (the Sekuruwe WTW) will be constructed. This WTW will be able to provide potable water to mining clients and residents for various rural villages.
- Mining water users will also be able to draw water from the raw water line at various points towards Sekuruwe. This will be handled by means of offtake agreements.

This Basic Assessment Report (BAR) has been compiled for the Mokopane WTW which is situated along the Phase 2B+ pipeline alignment. LWUA is proposing to construct the Mokopane WTW and associated infrastructure. The overall objective of the proposed development is to supply potable water for commercial and residential purposes. A separate application for EA for the proposed Sekurume WTW will be submitted for evaluation and approval, as discussed, and agreed during the Pre-Application meeting held on 16 August 2023, and the minutes thereof attached as **Appendix G**.

### **PROJECT AREA (MOKOPANE WTW)**

The Mokopane WTW is situated approximately 2.5 km southeast of Mokopane Town, near Mogalakwena Landfill, within the jurisdiction of Mogalakwena Local Municipality, of the greater Waterberg District Municipality, in the Limpopo Province. The ultimate capacity of WTW is proposed to be 28Ml/d. The preferred site (indicated in green in Figure 3) is located on Portion 80 of the Farm Piet Potgietersrust Town and Townlands 44 KS, and the property is owned by Mogalakwena Local Municipality. Whereas the alternative site (indicated in red in Figure 3) is situated on Portion 80 of the Farm Piet Potgietersrust Town and Townlands 44 KS, and Portion 69 of the Farm Maribashhoek 50 KS. The development site appears to be in an undeveloped vacant land (which appears to be a greenfield site), surrounded by farmhouses on the west and south area. Agricultural fields are roughly 1 500 m southwest of the site, and a light industrial area is approximately 500 m west of the project site.



**Figure 3: Locality Map of the proposed Mokopane WTW**

This application involves the following components, including but not limited to, within the footprint applied for:

- **Guard house/ Access Control** for security purposes and for access control. The guardhouse is developed to accommodate guards who will be protecting the water service infrastructure and for controlling the access to both the reservoirs and the WTW;
- **Main administration building** which includes a control room, the laboratory and the main administration areas (i.e., ablutions, workshop and store room);
- **Sludge lagoons** to dry the sludge produced from the WTW;
- **Machine Room;**
- **A Chemical Storage Area** for the safe handling and storage of chemicals delivered to and stored on site; and
- **Access and Internal Roads.**

### OVERVIEW OF THE WTW PROCESS

The Mogalakwena Bulk Water Master Plan incorporates two new WTW (Mokopane and Sekuruwe), treating raw water transferred in a pipeline from the Flag Boshielo Dam. The treatment process selected includes the following stages (refer to **Appendix G** for a process flow diagram):

- Coagulation and Flocculation
- Dissolved air flotation
- Direct filtration



- Disinfection
- Stabilisation

The processes above are augmented or facilitated by the addition of chemicals to the process. These chemicals will include powder activated carbon (PAC) for taste and odour, Sodium Hydroxide (NaOH) and Sulfuric Acid (H<sub>2</sub>SO<sub>4</sub>) for pH control, Aluminium sulphate for coagulation, an organic polyelectrolyte to aid flocculation and chlorine for disinfection. The process will result in a waste stream (or 'treatment residue') to be stored on site in sludge lagoons and periodically removed from the site for ultimate disposal or re-use.

Since the proposed treatment works at Mokopane is now only in the design stage, there is no information on the quality and characteristics of water treatment residue (sludge) to be managed. A Water Treatment Residue (WTR) sample from an existing WTW (the Flag Boshielo WTW), that treats water from the same source as the proposed scheme (Flag Boshielo Dam), was therefore collected and analysed to serve as a proxy to guide the residue management plans. It is expected that, regardless of treatment processes adopted for the proposed works, the treatment residues will be similar in nature (containing coagulant precipitates and inert solids).

The analysis of the laboratory results of the WTR from the Flag Boshielo WTW in terms of current regulation in South Africa indicates that the WTR is classified as non-hazardous waste according to SANS 10234 and assessed to be Waste Type 3 which is suitable for disposal in a Class C landfill, an activity which requires a Waste Management License (WML). In the interest of sustainability, recycling and reuse of waste is preferable to its disposal. The laboratory results also indicate that the WTR is suitable for land application.

## 2. FEASIBLE AND REASONABLE ALTERNATIVES

**“alternatives”**, in relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to—

- the property on which or location where it is proposed to undertake the activity;
- the type of activity to be undertaken;
- the design or layout of the activity;
- the technology to be used in the activity;
- the operational aspects of the activity; and
- the option of not implementing the activity.

Describe alternatives that are considered in this application. Alternatives should include a consideration of all possible means by which the purpose and need of the proposed activity could be accomplished in the specific instance taking account of the interest of the applicant in the activity. The no-go alternative must in all cases be included in the assessment phase as the baseline against which the impacts of the other alternatives are assessed. The determination of whether site or activity (including different processes etc.) or both is appropriate needs to be informed by the specific circumstances of the activity and its environment. After receipt of this report the Department may also request the applicant to assess additional alternatives that could possibly accomplish the purpose and need of the proposed activity if it is clear that realistic alternatives have not been considered to a reasonable extent.



Paragraphs 3 – 13 below should be completed for each alternative.

**3. ACTIVITY POSITION**

Indicate the position of the activity using the latitude and longitude of the centre point of the site for each alternative site. The co-ordinates should be in degrees, minutes and seconds. The projection that must be used in all cases is the Hartebeeshoek 94 WGS84 spheroid in a national or local projection.

List alternative sites, if applicable.

**Latitude (S):**

**Longitude (E):**

**Alternative:**

Alternative S1<sup>3</sup> (preferred or only site alternative)

Alternative S2 (if any)

Alternative S3 (if any)

24°	12'	08.55"	29°	01'	48.25"
24°	11'	45.07"	29°	02'	31.13"

**Site Corner points for the footprint of the WTW (Preferred Site):**

Position	Latitude			Longitude		
Eastern point	24°	12'	08.21"	29°	01'	48.49"
Southern corner	24°	12'	15.21"	29°	01'	43.80"
Western point	24°	12.'	12.28"	29°	01'	41.52"
North-western corner	24°	12'	08.39"	29°	01'	40.65"
Northern point (site access point)	24°	12'	05.50"	29°	01'	45.86"

**Site Corner points for the footprint of the WTW (Alternative Site):**

Position	Latitude			Longitude		
Northeastern corner	24°	11'	43.27"	29°	02'	31.38"
South-eastern corner	24°	11'	47.97"	29°	02'	32.77"
Southern point	24°	11'	51.12"	29°	02'	30.11"
South-western corner	24°	11'	48.35"	29°	02'	29.41"
North-western corner	24°	11'	41.63"	29°	02'	25.72"
Northern point	24°	11'	40.22"	29°	02'	26.56"

*Note from Zutari: The below refers to the new access road to be constructed for the alternative site. Whereas the preferred site would not require a new access road.*

<sup>3</sup> "Alternative S.." refer to site alternatives.

**Site Corner points for the footprint of the access road (Alternative Site):**

Position	Latitude			Longitude		
Starting point	24°	11'	52.29"	29°	02'	02.21"
Middle point	24°	11'	28.75"	29°	02'	11.21"
End point	24°	11'	48.27"	29°	02'	29.38"

**In the case of linear activities: NOT APPLICABLE**

**Alternative:**

**Latitude (S):**

**Longitude (E):**

Alternative S1 (preferred or only route alternative)

- Starting point of the activity
- Middle/Additional point of the activity
- End point of the activity

°	'	"	°	'	"
°	'	"	°	'	"
°	'	"	°	'	"

Alternative S2 (if any)

- Starting point of the activity
- Middle/Additional point of the activity
- End point of the activity

°	'	"	°	'	"
°	'	"	°	'	"
°	'	"	°	'	"

Alternative S3 (if any)

- Starting point of the activity
- Middle/Additional point of the activity
- End point of the activity

°	'	"	°	'	"
°	'	"	°	'	"
°	'	"	°	'	"

For route alternatives that are longer than 500m, please provide an addendum with co-ordinates taken every 250 meters along the route for each alternative alignment.

**4. PHYSICAL SIZE OF THE ACTIVITY**

Indicate the physical size of the preferred activity/technology as well as alternative activities/technologies (footprints):

**Alternative:**

**Size of the activity:**

Alternative A1<sup>4</sup> (preferred activity alternative)

51 400.56 m<sup>2</sup> – WTW  
There is no access road required

Alternative A2 (if any)

22 044.49m<sup>2</sup> – WTW

<sup>4</sup> "Alternative A.." refer to activity, process, technology or other alternatives.

Alternative A3 (if any)

7 308.23m <sup>2</sup> – Access Road
m <sup>2</sup>

Note from Zutari: The combined total footprint of the WTW and access road (i.e., the alternative site) is approximately 29 352.72 m<sup>2</sup>.

or,

for linear activities:

**Length of the activity:**

**Alternative: NOT APPLICABLE**

Alternative A1 (preferred activity alternative)

Alternative A2 (if any)

Alternative A3 (if any)

	m
	m
	m

Indicate the size of the alternative sites or servitudes (within which the above footprints will occur):

**Size of the site/servitude:**

**Alternative: NOT APPLICABLE**

Alternative A1 (preferred activity alternative)

Alternative A2 (if any)

Alternative A3 (if any)

	m <sup>2</sup>
	m <sup>2</sup>
	m <sup>2</sup>

## 5. SITE ACCESS

**Does ready access to the site exist?**

YES	NO
m	

**If NO, what is the distance over which a new access road will be built**

**Describe the type of access road planned:**

With respect to the preferred site, the site is accessible from the road to the existing landfill. The site would be accessed via the R518, and thereafter joining the existing dirt road which leads to the Mogalakwena Landfill. At the T-junction of the existing dirt road and R518, the site would be located approximately 800 m towards the east (i.e., towards Mogalakwena Landfill).

It is important to clarify that this existing dirt road is not a part of this EA application (i.e., it does not trigger any listed activity in terms of the NEMA, Environmental Impact Assessment (EIA) Regulations of 2014); rather, it has been included solely for the purpose of enhancing the understanding of the project.

Note from Zutari: Whereas for the alternative site - A new access road of approximately 1 185m in length will be constructed to access the site from the existing dirt road located west of the project site (i.e., at the Mogalakwena Landfill) and traverse to the WTW. This access road start next to the landfill site (i.e., at point 24°11'52.29"S ; 29°02'02.21"E) and traverses in a northerly direction for approximately 520m, thereafter turns towards the east and traverses in a south easterly direction towards the WTW.

Include the position of the access road on the site plan and required map, as well as an indication of the road in relation to the site.

## 6. SITE OR ROUTE PLAN

A detailed site or route plan(s) must be prepared for each alternative site or alternative activity. It must be attached as Appendix A to this document.

The site or route plans must indicate the following:

- 6.1 the scale of the plan which must be at least a scale of 1:500;
- 6.2 the property boundaries and numbers of all the properties within 50 metres of the site;
- 6.3 the current land use as well as the land use zoning of each of the properties adjoining the site or sites;
- 6.4 the exact position of each element of the application as well as any other structures on the site;
- 6.5 the position of services, including electricity supply cables (indicate above or underground), water supply pipelines, boreholes, street lights, sewage pipelines, storm water infrastructure and telecommunication infrastructure;
- 6.6 all trees and shrubs taller than 1.8 metres;
- 6.7 walls and fencing including details of the height and construction material;
- 6.8 servitudes indicating the purpose of the servitude;
- 6.9 sensitive environmental elements within 100 metres of the site or sites including (but not limited thereto):
  - rivers;
  - the 1:100 year flood line (where available or where it is required by Department of Water Affairs);
  - ridges;
  - cultural and historical features;
  - areas with indigenous vegetation (even if it is degraded or invested with alien species);
- 6.10 for gentle slopes the 1 metre contour intervals must be indicated on the plan and whenever the slope of the site exceeds 1:10, the 500mm contours must be indicated on the plan; and
- 6.11 the positions from where photographs of the site were taken.

Note from Zutari: The site layout plans for both the preferred and alternative sites can be found in Appendix A.

## 7. SITE PHOTOGRAPHS

Colour photographs from the centre of the site must be taken in at least the eight major compass directions with a description of each photograph. Photographs must be attached under Appendix B to this form. It must be supplemented with additional photographs of relevant features on the site, if applicable.

Note from Zutari: The site photographs for both the preferred and alternative sites can be found in Appendix A.

## 8. FACILITY ILLUSTRATION



A detailed illustration of the activity must be provided at a scale of 1:200 as Appendix C for activities that include structures. The illustrations must be to scale and must represent a realistic image of the planned activity. The illustration must give a representative view of the activity.

Note from Zutari: The facility illustration are included as Appendix C of this BAR.

## 11. ACTIVITY MOTIVATION

### 9(a) Socio-economic value of the activity

Note from Zutari: The figures below are estimated values and are representative of the Olifants Management Model Programme Bulk Water Study Phase (i.e. the entire project, including Mokopane WTW)

What is the expected capital value of the activity on completion?

- The overall expected contract capital value of the OMM Programme, inclusive of the two Northern Limb Water Treatment Works (WTWs) is R25 billion (excl. funding costs). The value of the two WTWs will be R650 million.

R 650 million

What is the expected yearly income that will be generated by or as a result of the activity?

- The existing and new raw water and new bulk water infrastructure included in the OMM Programme scopes of work (inclusive of the Northern Limb WTWs) will be operated and maintained as an extension of the current Lebalelo Water User Association's operations and maintenance activities. The Association, of which membership is split on a 50/50 basis between Government (represented by Department of Water and Sanitation and the Water Service Authorities in the affected regions) and commercial/industrial sector in the region (more than 80% Platinum Mines), operates on a cost recovery model as a non-profit organisation directly managed by the Association's members. Revenue is therefore directly linked to the direct underlying operation and maintenance costs deployed by the Association, reserving requirements and debt service where applicable. Revenue will be generated from the Association's members based on recovering agreed costs in a combination of fixed and demand-dependent water tariffs invoiced.
- Water from the overall network, including the WTWs will not be 100% utilised from day one with an expected gradual build-up of demand, matching the municipal and commercial sector growths in the region. Although the fixed tariff component is based on acquired capacity in the system by the respective member, due to the increased demand uptake over time, the yearly income will change annually over the life expectancy of the network, matching the water demands of the region.

100% cost recovery

<p>Will the activity contribute to service infrastructure?</p> <ul style="list-style-type: none"> <li>• Yes, through the construction of Phases 2B and 2B+ from Flag Boshielo dam to Sekuruwe, the OMM Programme will deliver bulk raw water to the two (2) WTWs in the Northern Limb i.e. the 28 MI/day Mokopane WTWs and the 21 MI/day Sekuruwe WTWs. These two (2) WTWs will be used to treat the additional bulk raw water to potable water for residents within the Mogalakwena Local Municipality. Only ~25% of the treated water, included in the OMM Programme scope of work, will be distributed to rural communities within the Sekuruwe area and member doorstep communities in the Sekhukhune district. The remainder of the potable water is available for municipal distribution. The total volume of water that will be treated by the OMM Programme equates to more than 1 million additional individuals, at 65 litres per person per day, will be able to benefit from the programme.</li> <li>• In terms of the Northern Limb, over and above addressing the shortfall currently experienced at Mokopane, the OMM Programme will provide potable water, on a yard connection to ~130 000 people in the Sekuruwe area of the Mogalakwena Local Municipality.</li> <li>• The OMM Programme will also support the two affected Water Service Authorities with water management and conservation in the respective regions.</li> </ul>	YES	NO
<p>Is the activity a public amenity?</p> <ul style="list-style-type: none"> <li>• Yes, the OMM Programme will support the treatment of a total of 94.5MI/day of raw water for the Eastern and Northern Limb, split 50:50. This application is for the treatment of 28 MI/day at Mokopane (to cater for the shortfall of 20 MI/day in Mokopane) and 21 MI/day at Sekuruwe for rural distribution to communities in that area.</li> <li>• Water distribution will both tie into existing infrastructure to improve the reliability of supply, but also distributed to the public on a yard connection basis in the Sekuruwe region by the OMM Programme.</li> <li>• Water not utilised by the previous statement is available to the Water Service Authority and local municipalities for distribution to the public.</li> </ul>	YES	NO
<p>How many new employment opportunities will be created in the development phase of the activity?</p> <ul style="list-style-type: none"> <li>• Approximately 42 000 people will be impacted through direct, indirect and induced employment for the duration of the OMM Programme.</li> <li>• The overall OMM Programme, inclusive of the two WTWs, will create 16,300 jobs in the Limpopo Province linked to the construction spend with a further 9,000 jobs linked to the ongoing operational spend. This exclude the extra jobs that will be created by the Commercial Members due to their access to water over the duration of the programme.</li> </ul>	25 300 (direct & indirect)	
<p>What is the expected value of the employment opportunities during the development phase?</p> <ul style="list-style-type: none"> <li>• The OMM Programme will add an estimated R3.1 billion to the average annual household income based on the capital expenditure over the 7-year period and R2.4 billion linked to the operational spend in Limpopo Province over 28 years.</li> </ul>	R5.5 billion	
<p>What percentage of this will accrue to previously disadvantaged individuals?</p> <ul style="list-style-type: none"> <li>• Based on the above additional R5.5 billion average annual household income, low-income groups within the Limpopo Province would receive approximately 30% (R0.93 billion) and 39% (R0.94 billion) respectively.</li> </ul>	34%	

How many permanent new employment opportunities will be created during the operational phase of the activity?

- For clarification refer to the above descriptions.

9,000

What is the expected current value of the employment opportunities during the first 10 years?

- For clarification refer to the above descriptions.

R 3.1 billion the first 7-year period  
R2.4 billion operational spent, over 28-years

What percentage of this will accrue to previously disadvantaged individuals?

- For clarification refer to the above descriptions.

34%

**9(b) Need and desirability of the activity**

Motivate and explain the need and desirability of the activity (including demand for the activity):

**NEED:**

The OMMP-BRWSP (and previously the ORWRDP) was initiated to reduce the water demands on the Flag Boshielo Dam in the Limpopo province, which is the key water resource in the region. The project also aimed to meet the increasing water demand of the City of Polokwane, as well as allowing the respective WSAs to have surplus water to meet their water demands. The project bulk infrastructure plan allows for the construction of raw water pipeline systems to the identified target areas. The MWMP for the MLM (as mentioned previously, also a WSA) recognised the need for two separate WTWs. One of the required WTW is the proposed Mokopane WTW, which will treat raw water from the Flag Boshielo Dam and supply potable water for residential and commercial users.

The revised scope of the project will prioritise the following key aspects (of the OMMP-BRWSP):

- Abstract the LWUA scheme water primarily from the De Hoop dam instead of the Olifants River to relieve pressure on the already over-allocated Flag Boshielo Dam;
- Re-sequence the construction of OMMP-BRWSP bulk raw water infrastructure to meet revised water needs; and
- Support existing potable WSAs and develop potable water infrastructure in defined areas in the Northern and Eastern Limb to address immediate and long-term social water needs of the WSAs.

Phase 2 of the project consists of four major components, namely, bulk water pipeline from De Hoop to Steelpoort; bulk distribution system comprising pipelines and pump stations from Steelpoort linking with the existing Olifants-Sand transfer scheme; bulk distribution system from the Flag Boshielo dam to Mokopane; and acquisition of the LWUA infrastructure for incorporation into the project. A bulk distribution system means that the Flag Boshielo and De Hoop dams will be able to function as a single system, thereby enabling a higher water supply level to the target areas.

Further, since inception, the project has acquired the status of strategic importance, and recently on 05 March 2023 the project was classified as a Strategic Integrated Project (SIP) under the SIP 19 (i.e., Water and Sanitation Infrastructure Portfolio). As such, it is critical that the project must be expedited in terms of Schedule 2 (Section 17(2)) of the Infrastructure Development Act (Act No. 23 of 2014). The purpose of this piece of legislation is to provide facilitation and coordination of public infrastructure development which is of economic significance or social importance in South Africa and to ensure that infrastructure development in the country is given priority in planning, approval, and implementation.

Importantly, the WSAs have been unable to realise the ambitions (i.e. to reduce water demands on the Flag Boshielo Dam, meet the increasing water demands of the City of Polokwane, and allowing the respective Water Service Authorities (WSAs) to have surplus water to meet their water demands) of the project on their own and the DWS has since appointed the LWUA to implement the most critical aspects of the scheme on their behalf. The DWS along with other stakeholders are working together to meet the following objectives:

- Delivering raw water and potable water to the region;
- Meeting the required water demand in the region; and
- Realising the socio-economic development expectations in the region.

In addition, delays in implementing the scheme, currently only partially implemented and not operational, have led to water infrastructure being vandalised, specifically the existing underground pipeline in Phase 2B+, authorised by EA (12/19/1-W131). It is thus critical for the project to proceed urgently to stabilise the region. Moreover, the need for clean drinking water is well documented and reasons for access to potable water include, and not limited to:

- Safe drinking water that is not harmful to human health;
- Reduce the reliance of rural communities (generally low-income households) on raw surface or groundwater water (i.e., often unsafe for human consumption);
- Improved livelihood and quality of life;
- Prevent, combat, or reduce the risk of contracting waterborne diseases;
- Safe and readily available water is important to public health, whether it is used for drinking, domestic use, food production or recreational; and
- Provision of adequate (clean) water supply infrastructure means less expenditure on health, as people are less likely to fall ill and incur medical costs (as a result of contracting waterborne disease), and importantly are better able to remain economically productive.

i.	Was the relevant municipality involved in the application?	YES	NO
ii.	Does the proposed land use fall within the municipal Integrated Development Plan?	YES	NO
iii.	If the answer to questions 1 and / or 2 was NO, please provide further motivation / explanation:		
	Not applicable		

**DESIRABILITY:** Refer to the above: 9(b) The Need and Desirability description.

i.	Does the proposed land use / development fit the surrounding area?	YES	NO
ii.	Does the proposed land use / development conform to the relevant structure plans, Spatial development Framework, Land Use Management Scheme, and planning visions for the area?	YES	NO



iii.	Will the benefits of the proposed land use / development outweigh the negative impacts of it?	YES	NO
iv.	If the answer to any of the questions 1-3 was NO, please provide further motivation / explanation:		
	Not applicable		
v.	Will the proposed land use / development impact on the sense of place?	YES	NO
vi.	Will the proposed land use / development set a precedent?	YES	NO
vii.	Will any person's rights be affected by the proposed land use / development?	YES	NO
viii.	Will the proposed land use / development compromise the "urban edge"?	YES	NO
ix.	If the answer to any of the question 5-8 was YES, please provide further motivation / explanation.		
	Not applicable		

<b>BENEFITS:</b>			
i.	Will the land use / development have any benefits for society in general?	YES	NO
ii.	<p>Explain:</p> <p>The implementation of the overall bulk water infrastructure under the OMMP-BRWSP would reduce the load on the Flag Boshielo Dam by abstracting water primarily from the De Hoop dam instead of the Olifants River to relieve pressure on the already over-allocated Flag Boshielo Dam. The project itself would develop the much-needed bulk water infrastructure, including the WTW required to treat raw water, and thereafter supply potable water to residents and commercial users.</p> <p>On a broader context, the project would contribute towards addressing water and sanitation challenges in the region. In addition, this WTW under the OMMP-BRWSP is a project of national strategic importance and aligns with the National Infrastructure Plan (NIP) and one of the critical actions of the National Development Plan (NDP): 2030 vision.</p> <p>More specifically, the objectives of the project would allow MLM, as a WSA to respond to the water demand, supply water and sanitation services to the communities falling within its area of jurisdiction. Thus, the overall project (OMMP-BRWSP) would ultimately benefit the local community, Mogalakwena region and the Limpopo Province.</p> <p>Further, the overall project would also have international significance, as it contributes to South Africa being able to support and meet its international obligations by aligning with the global Sustainable Development Goals (SDGs). These 17 SDGs are part of the 2030 Agenda, adopted by the United Nations (UN) General Assembly on 25 September 2015, for Sustainable Development. South Africa is a member of the United Nations (UN) and has committed to internationally agreed strategies to achieve these goals. The SDG target 6.1, calls for universal and equitable access to safe and affordable drinking water.</p>		

iii.	Will the land use / development have any benefits for the local communities where it will be located?	YES	NO
iv.	<p>Explain:</p> <p>The community needs the project since it would benefit directly from the bulk water supply infrastructure. The project will provide potable water to the residents; and provide both raw and potable water to commercial users, thereby potentially enabling the provision of basic water-services and associated infrastructure. In addition, the Mokopane residents would benefit directly and obtain potable water from the WTW. Moreover, at least 16 300 jobs will be created during the construction phase of the OMMP-BRWSP project, and further 9 00 jobs will be linked to the ongoing operational phase.</p>		

## 10. APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES

List all legislation, policies and/or guidelines of any sphere of government that are applicable to the application as contemplated in the EIA regulations, if applicable:

Legal Requirements		
Legislation considered	Relevant Organ of State / authority	Aspect of Project
<b>The Republic of South Africa Constitution Act (Act No. 108 of 1996) ("the Constitution")</b>	Parliament	The environmental right contained in Section 24 of the Constitution provides that everyone is entitled to an environment that is not harmful to his or her well-being.
<b>National Environmental Management Act (Act No. 107 of 1998) (NEMA)</b>	Competent Authority (LEDET)	<p>NEMA establishes the principles for decision-making on matters affecting the environment. Section 2 of the Act sets out the National Environmental Management principles which apply to the actions of organs of state that may significantly affect the environment.</p> <p>Furthermore, Section 28(1) states that <i>"every person who causes or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring"</i>.</p> <p>If such pollution or degradation cannot be prevented, then appropriate measures must be taken to minimise or rectify such pollution or degradation.</p> <p>The applicant has the responsibility to ensure that the proposed activity and EIA process conform to the principles of NEMA. In developing the EIA process, Zutari has been cognisant of this need, and accordingly the EIA process has been undertaken in terms of NEMA and the EIA Regulations<sup>5</sup>. Several listed activities in these regulations are triggered, as indicated in the Environmental Authorisation application form.</p>
<b>National Water Act (Act No. 36 of 1998) (NWA)</b>	Department of Water and Sanitation (DWS)	<p>The NWA provides for the sustainable and equitable use and protection of water resources. It is founded on the principle that the National Government has overall responsibility for and authority over water resource management, including the equitable allocation and beneficial use of water in the public interest, and that a person can only be entitled to use water if the use is permissible under the NWA. Section 21 of the NWA specifies the water uses which require authorisation from the DWS in terms of the NWA before they may commence.</p> <p>LWUA will apply for Water Use Licences (WULs) or General Authorisation (GA) registrations required in terms of the Section 21 of the NWA.</p>

<sup>5</sup>GN No. R 982, 983, 984, and 985 in Government Gazette No.38282 of 4 December 2014.

<b>National Heritage Resources Act (Act No. 25 of 1999) (NHRA)</b>	South African Heritage Resources Agency (SAHRA) and/or Limpopo Heritage Resources Authority (LIHRA)	<p>In terms of the NHRA, any person who intends to undertake “any development which will change the character of a site exceeding 5,000 m<sup>2</sup> in extent, or involving three or more existing erven or subdivisions thereof”, “the construction of a road powerline, pipeline exceeding 300 m in length” or “the rezoning of site larger than 10,000 m<sup>2</sup> in extent...” must at the very earliest stages of initiating the development notify the responsible heritage resources authority, namely SAHRA or the relevant provincial heritage agency (LHRA). These agencies would, in turn, indicate whether or not a full Heritage Impact Assessment (HIA) would need to be undertaken.</p> <p>Section 38(8) of the NHRA specifically excludes the need for a separate HIA where the evaluation of the impact of a development on heritage resources is required in terms of an EIA process. Accordingly, since the impact on heritage resources would be considered as part of the EIA process outlined here, no separate HIA would be required. SAHRA or the Limpopo Provincial Heritage Resources Authority (LIHRA), will review the heritage assessments and provide comments to the LEDET, which would consider these comments in their final environmental decision. However, should a permit be required for the damaging or removal of specific heritage resources such as Palaeontological or archaeological objects, a separate application for such destruction would need to be submitted to the relevant heritage agency for approval.</p>
<b>Conservation of Agricultural Resources Act (Act No. 43 of 1983) (CARA)</b>	Department of Agriculture	<p>The CARA provides for the conservation of agricultural resources through limiting the sub-division of agricultural land, maintaining the production potential of land, combating and preventing erosion, preventing the weakening or destruction of water sources, protecting vegetation, and combating weeds and invader plants. As such, as part of the EIA process, recommendations should be made to ensure that measures are implemented to maintain the agricultural production of land (if possible).</p>
<b>National Environmental Management: Biodiversity Act (Act No. 10 of 2004) (NEM: BA)</b>	Department of Forestry, Fisheries and the Environment (DFFE) and LEDET	<p>The NEM:BA aims to conserve and manage the country’s biodiversity through the protection of species and ecosystems, specifically those which are threatened or considered to be critically endangered. It also serves to regulate the management of alien vegetation. In terms of NEM:BA a list of endangered, critically endangered, vulnerable, and protected species has been promulgated (Section 6, Table 3 of the Act), which calls for an EIA process, should any of the listed species be identified on the site and need to be removed. An ecological impact assessment, comprising a wetland assessment, floral assessment, and faunal assessment, has been undertaken to determine if any listed species are located on the proposed site.</p>
<b>National Environmental Management: Air Quality Act (Act No. 39 of 2004) (NEM: AQA)</b>	Mogalakwena Local Municipality	<p>The proposed WTWs is within the Air Quality-Waterberg Bojanala Priority Area</p> <p>Act requires certain activities, including industrial and construction activities, to obtain environmental authorization or permits. Construction projects that may release pollutants or particulate matter into the air may need to adhere to specific emission limits and licensing requirements. South Africa has established Air Quality Management Plans (AQMPs) for various regions. These plans aim to manage and improve air quality. Construction projects must comply with the emission standards and regulations outlined in these AQMPs. The Act sets emission standards for various pollutants, including sulfur dioxide, nitrogen oxides, and particulate matter. Construction activities that involve equipment such as generators, boilers, or machinery must ensure that emissions from these sources comply with the prescribed standards. Construction projects often generate dust, which can have adverse effects on air quality. The Act mandates measures for controlling dust emissions from construction sites. This may include the use of water sprays, dust screens, and other techniques to minimize dust pollution.</p> <p>In summary, the Air Quality Act in South Africa is relevant to construction projects as it governs emissions, dust control, and environmental authorization requirements. Compliance with this legislation is essential to ensure that construction activities do not adversely impact air quality and to avoid potential legal consequences.</p>
<b>National</b>	National Government	The South African Government through the Presidency has published a National

<p><b>Development Plan: A Vision for 2030</b></p>		<p>Development Plan. The Plan aims to eliminate poverty and reduce inequality by 2030. The Plan has the target of developing people's capabilities to improve their lives through education and skills development, health care, better access to public transport, jobs, social protection, rising income, housing and basic services, and safety. It proposes the following strategies to address the above goals:</p> <ol style="list-style-type: none"> <li>1. Creating jobs and improving livelihoods;</li> <li>2. Expanding infrastructure;</li> <li>3. Transition to a low-carbon economy;</li> <li>4. Transforming urban and rural spaces;</li> <li>5. Improving education and training;</li> <li>6. Providing quality health care;</li> <li>7. Fighting corruption and enhancing accountability; and</li> <li>8. Transforming society and uniting the nation.</li> </ol> <p>Important, one of the enabling milestones is to ensure that all South Africans have <u>access to clean running water</u> in their homes by 2023. One of the proposed critical actions is public infrastructure investment at 10% of gross domestic product (GDP), financed through tariffs, public-private partnerships, taxes and loans <u>focus on transport, energy and water</u>.</p>
<p><b>Mogalakwena Local Municipality: Integrated Development Plan, Final 2023/2024</b></p>	<p>Mogalakwena Local Municipality</p>	<p>The integrated development plan contains the strategies and goals for future development in the Mogalakwena Local Municipality. In terms of the District Development Model Waterberg District One Plan, the project is in line with the provision of <u>bulk basic services such as renewable energy, and water supply</u>. With regards to economic development, the project aligns with the strategy to strengthen and invest more in the <u>development and maintenance of water</u>, sanitation, electricity, and road infrastructure.</p>
<p><b>National Environmental Management: Waste Act (Act No. 59 of 2008) (NEM:WA)</b></p>	<p>LEDET</p>	<p>The raw water treatment process will continuously produce a "treatment residue" (i.e., dry sludge from the sludge lagoons), which will be stored on site and periodically removed for disposal or reuse. This activity will require authorisation through a Waste Management Licence (WML). This treatment residue or dry sludge will be disposed of at a licensed landfill, and there is also an option to use the dry sludge for land application.</p> <p>It is worth mentioning that at an existing Flag Boshielo WTW, a treatment residue sample was collected, analysed and the results classified the treatment residue as non-hazardous waste according to SANS 10234 and assessed to be Waste Type 3 which is suitable for disposal in a Class C landfill, an activity which requires a WML. The proposed Mokopane WTW will treat water from the same source as Flag Boshielo WTW. It is expected that, regardless of treatment processes adopted for the proposed Mokopane WTW, the treatment residue will be similar in nature (containing coagulant precipitates and inert solids) as the sample collected at Flag Boshielo WTW.</p>
<p><b>National Forest Act (Act No. 84 of 1998) (NFA)</b></p>	<p>DFFE</p>	<p>The National Forests Act provides protection for forests, woodlands and several specified species of trees, which are protected across South Africa. The latest list of protected trees, dating from 2014, contains a total of 47 species, specimens of which may not be cut or damaged without a permit.</p> <p>Where protected species are encountered within the footprint areas, permits from the LEDET and/or DFFE must be obtained for their removal and/or destruction prior to construction activities commencing.</p>
<p><b>The National Environmental Management: Protected Areas</b></p>	<p>DFFE</p>	<p>The objective of this act is to provide for the protection and conservation of ecologically viable areas representative of South Africa's biological biodiversity and its natural landscapes and seascapes; for the establishment of a national register of all national, provincial and local protected areas; for the management of those areas in accordance with national norms and</p>



Act, 2003 (Act. No. 57 of 2003) (NEMPAA);		standards; for intergovernmental co-operation and public consultation in matters concerning protected areas.  The Fossil Hominid Sites of SA are also considered a UNESCO World Heritage Site. As stipulated by Section 50 (5) of the NEMPAA: “No development, construction, or farming may be permitted in a nature reserve or world heritage site without the prior written permission of the management authority”. Although the Fossil Hominid Site was gazetted without a buffer zone, liaison with the relevant authorities may be required to establish if 1) the proposed development is viable within the UNESCO World Heritage Site, and 2) if any buffers are relevant.  Additionally, the focus area is located within 10 km of an additional protected area, namely the Glenesk Private Nature Reserve (~ 6 km northeast of the focus area).
Spatial Planning and Land Use Management Act, 2013 (SPLUMA)	Mogalakwena Local Municipality	The land parcels on which the proposed Mokopane WTW will be constructed, will need to be verified to confirm if the current land use, according to the municipality’s town planning scheme, is appropriate for the planned WTW.

## 11. WASTE, EFFLUENT, EMISSION AND NOISE MANAGEMENT

### 11(a) Solid waste management

Will the activity produce solid construction waste during the construction/initiation phase?

YES	NO
Approx. 10 - 20m <sup>3</sup>	

If yes, what estimated quantity will be produced per month?

How will the construction solid waste be disposed of (describe)?

It is anticipated that some solid construction waste will be generated which would include (list is not exhaustive) building rubble, packaging material, scrap, overburden material and general litter from construction workers. Therefore, it is recommended that construction waste or rubble be collected and stored temporarily in designated containers for the different waste streams on site and disposed of at a licensed landfill site.

Where will the construction solid waste be disposed of (describe)?

Construction solid waste will be disposed of at a licensed landfill. The appointed construction contractor will be responsible for waste management on site.

Will the activity produce solid waste during its operational phase?

If yes, what estimated quantity will be produced per month?

YES	NO
Approx. 5070 kg/month	

Note from Zutari: Filter backwash water (the waste stream from the WTW) will be sent to the backwash recovery tanks (BWRT). From the BWRT supernatant will be pumped back to the head of the works and the settled sludge sent to the silt lagoons. At the lagoons, the sludge will be allowed to dry out and cleaned every six months. For the Mokopane WTW, the expected dry solid waste per month is 5070kg/month. Supernatant overflow from the lagoons will be conveyed to the Mokopane WTW stormwater system.

How will the solid waste be disposed of (describe)?

The raw water treatment process will continuously produce a “treatment residue” (i.e., dry sludge from the sludge lagoons), which will be stored on site and periodically removed for disposal or reuse. This treatment residue or dry sludge will be disposed of at a licensed landfill, and there is also an option to use the dry sludge for land application. It is important to note that the Mokopane WTW is now only in design stage, therefore, the amount of treatment residue will be known and made available during the operation phase.

In light of the above, it is worth mentioning that at an existing Flag Boshielo WTW, a treatment residue sample was collected, analysed and the results classified the treatment residue as non-hazardous waste according to SANS 10234 and assessed to be Waste Type 3 which is suitable for disposal in a Class C landfill, an activity which requires a WML. The proposed Mokopane WTW will treat water from the same source as Flag Boshielo WTW. It is expected that, regardless of treatment processes adopted for the proposed Mokopane WTW, the treatment residue will be similar in nature (containing coagulant precipitates and inert solids) as the sample collected at Flag Boshielo WTW.

Where will the solid waste be disposed if it does not feed into a municipal waste stream (describe)?

As indicated, construction waste will be disposed of at a licensed landfill. It is anticipated that the resultant treatment residue from the Mokopane WTW will be disposed of at a Class C landfill during operation. This is solely based on the classification and assessment results of the treatment residue from the Flag Boshielo WTW (refer to paragraph above). Another option, that is currently being considered, will be to reuse the sludge in land application. Should the waste assessment and classification of the Mokopane WTW sludge reveal otherwise, the department will be notified.

If the solid waste (construction or operational phases) will not be disposed of in a registered landfill site or be taken up in a municipal waste stream, then the applicant should consult with the department to determine whether it is necessary to change to an application for scoping and EIA.

Can any part of the solid waste be classified as hazardous in terms of the relevant legislation?

YES	NO <sup>6</sup>
-----	-----------------

If yes, inform the department and request a change to an application for scoping and EIA.

Is the activity that is being applied for a solid waste handling or treatment facility?

YES	NO
-----	----

If yes, then the applicant should consult with the Department to determine whether it is necessary to change to an application for scoping and EIA.

<sup>6</sup> A waste assessment and classification will be done on the sludge that will be produced from the treatment of raw bulk water. Only then will the applicant know the category (i.e., hazardous, or non-hazardous) of waste produced.

**11(b) Liquid effluent**

Will the activity produce effluent, other than normal sewage, that will be disposed of in a municipal sewage system?

YES	NO
-----	----

If yes, what estimated quantity will be produced per month?

Not applicable	
----------------	--

Will the activity produce any effluent that will be treated and/or disposed of on site?

Yes	NO
-----	----

If yes, the applicant should consult with the Department to determine whether it is necessary to change to an application for scoping and EIA.

Will the activity produce effluent that will be treated and/or disposed of at another facility?

YES	NO
-----	----

If yes, provide the particulars of the facility:

Facility name:	Not applicable	
Contact person:		
Postal address:		
Postal code:		
Telephone:	Cell:	
E-mail:	Fax:	

Describe the measures that will be taken to ensure the optimal reuse or recycling of waste water, if any:

During construction the normal sewage will be handled via temporary ablution facilities (such as portable toilets) that will be serviced by a contractor on a regular interval (i.e., as, and when needed). During the operational phase, it is anticipated that there will be underground holding tanks (conservancy tanks) close to the administration building and the workshops. The sewage from these buildings will drain into these conservancy tanks and then will be removed for treatment by a vacuum truck, commonly referred to as a 'Honey-Sucker'. The frequency of the emptying of these tanks will need to be monitored as the plant becomes utilised.

Besides normal sewage, which will be handled via septic tanks that will be serviced by a contractor during construction, the only wastewater expected on site will be from the sludge lagoons. This water (i.e., supernatant from the sludge lagoons) is not expected to be re-used or recycled. However, options available for the discharge of the settled water are outlined in Section 12 (i.e., water use section) below.

**11(c) Emissions into the atmosphere**

Will the activity release emissions into the atmosphere?

YES	NO
-----	----

If yes, is it controlled by any legislation of any sphere of government?

YES	NO
-----	----

If yes, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

If no, describe the emissions in terms of type and concentration:

---

Dust from construction activities (i.e., excavators, TLB's and heavy vehicles (e.g., trucks) moving in and out of the construction area). The national dust control regulations under the NEM:AQA, were published in Government Gazette 34307 under GN309 on 27 May 2011. In terms of these regulations;

- No person may conduct any activity in such a way as to give rise to dust in such quantities and concentrations that –
- The dust, or dust fall, has a detrimental effect on the environment, including health, social conditions, economic conditions, ecological conditions, or cultural heritage, or has contributed to the degradation of ambient air quality beyond the premises where it originates; or
- The dust remains visible in the ambient air beyond the premises where it originates; or
- 600 mg/m<sup>2</sup>/day averaged over 30 days in residential and light commercial areas measured using reference method ASTM D1739; or
- 1200 mg/m<sup>2</sup>/day averaged over 30 days in areas other than residential and light commercial areas measured using reference method ASTM D1739.

The detailed Ambient Air Quality Impact Assessment was undertaken to support this application, and can be found in Appendix D.

**11(d) Generation of noise**

Will the activity generate noise?

YES	NO
-----	----

If yes, is it controlled by any legislation of any sphere of government?

YES	NO
-----	----

If yes, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

If no, describe the noise in terms of type and level:

It is anticipated that noise will emanate from the construction activities, especially from the usage of earthmoving equipment (e.g., dump trucks, dozers, excavators, tractor loader backhoes and other heavy vehicles (commonly known as yellow machines)) moving into and out of the construction site. The surrounding landowners and residents must be informed should any unusual noise levels be expected or if construction activities are set to continue beyond normal working hours (i.e., 7am – 5pm). The plant (WTW) itself will be fitted with noise reduction measures.

**12. WATER USE**

Please indicate the source(s) of water that will be used for the activity by ticking the appropriate box(es)

<input type="checkbox"/> municipal	<input type="checkbox"/> water board	<input type="checkbox"/> groundwater	<input checked="" type="checkbox"/> river, stream, dam or lake	<input type="checkbox"/> other	<input type="checkbox"/> the activity will not use water
------------------------------------	--------------------------------------	--------------------------------------	--	--------------------------------	--

If water is to be extracted from groundwater, river, stream, dam, lake or any other natural feature, please indicate

the volume that will be extracted per month:

67.6 m <sup>3</sup> /month
----------------------------

Does the activity require a water use permit from the Department of Water Affairs?

YES	NO
-----	----

If yes, please submit the necessary application to the Department of Water Affairs and attach proof thereof to this application if it has been submitted.

A water use licence application will be submitted DWS for the overall OMMP-BRWSP project. It is expected that the process silt lagoons will discharge settled supernatant from the filter backwash. The discharge from the lagoons needs to be registered with the DWS and it is expected it will easily fall within the water quality requirements of the General Authorisation (GA). The volume of discharge water anticipated will depend on the volume of water discharged to the lagoons from the Backwash water recovery tank (BWRT).

The following options are available for the discharge of the settled water from the lagoons:

- a. Discharge into a local water course,
- b. Supernatant from the backwash recovery tank will be pumped back to the head of works.

The nature of this project (i.e., Mokopane WTW) is to treat raw water to potable water quality standard. Water to be treated will be sourced from the Flag Boshielo Dam. The project itself will use the raw water during operation. Raw water (to be treated) will only be sourced when the pipelines conveying the water are built and the plant is commissioned at the end of the construction period.

During construction, the appointed contractor will be responsible for sourcing water for construction, however, it is anticipated that this water will either be sourced from the MLM, groundwater, or a river, stream, dam or lake as indicated in the box above. Should municipal water be required during construction, the contractor must obtain a service level agreement from the relevant municipality confirming the availability of the required volume of water.

### 13. ENERGY EFFICIENCY

Describe the design measures, if any, that have been taken to ensure that the activity is energy efficient:

The rooms in the building, such as all the offices and the laboratory have a natural outlook, they have natural lighting and ventilation and are ergonomically efficient.

In order to maximise energy in the design of Mokopane WTW, the following principles were undertaken during design:

- Direct sunlight minimised in summer, but maximised for the winter months;
- Allowing for sufficient thermal mass in the structures to insulate the structures where mostly required (i.e. administration building);
- Provided as much natural light as possible, to limit the requirement for lighting; and
- Utilisation of energy efficient technologies such as LED lighting and solar heated water supply; and
- Incorporation of passive ventilation.

Describe how alternative energy sources have been taken into account or been built into the design of the activity, if any:

Currently, there is an ongoing assessment of the feasibility of utilising renewable energy to supply power to the pump stations tasked with facilitating the transfer of raw water from the Flag Boshielo dam to the envisioned WTWs. Additionally, an exploration into the potential adoption of renewable energy sources for the sustained operation of the WTW is underway.



## SECTION B: SITE/AREA/PROPERTY DESCRIPTION

### Important notes:

1. For linear activities (pipelines, etc) as well as activities that cover very large sites, it may be necessary to complete this section for each part of the site that has a significantly different environment. In such cases please complete copies of Section C and indicate the area, which is covered by each copy No. on the Site Plan.

Section C Copy No. N/A  
(e.g. A):

2. Paragraphs 1 - 6 below must be completed for each alternative.

3. Has a specialist been consulted to assist with the completion of this section? 

YES	NO
-----	----

If YES, please complete the form entitled "Details of specialist and declaration of interest" for each specialist thus appointed:

All specialist reports must be contained in Appendix D.

Property description/physical address:

Portion 80 of the Farm Piet Potgietersrust Town and Townlands 44 KS, and Portion 69 of the Farm Maribashhoek 50 KS, near Mokopane in the Mogalakwena Local Municipality, Limpopo Province.

(Farm name, portion etc.) Where a large number of properties are involved (e.g. linear activities), please attach a full list to this application.

Not applicable

In instances where there is more than one town or district involved, please attach a list of towns or districts to this application.

Current land-use zoning:

Undetermined, but it is likely that the zoning would be agricultural. The MLM will be consulted to confirm the current zoning.

In instances where there is more than one current land-use zoning, please attach a list of current land use zonings that also indicate which portions each use pertains to , to this application.

Is a change of land-use or a consent use application required?

YES	NO
-----	----

Must a building plan be submitted to the local authority?

YES	NO
-----	----

Locality map:

An A3 locality map must be attached to the back of this document, as Appendix A. The scale of the locality map must be relevant to the size of the development (at least 1:50 000. For linear activities of more than 25 kilometres, a smaller scale e.g. 1:250 000 can be used. The scale must be indicated on the map.) The map must indicate the following:

- an indication of the project site position as well as the positions of the alternative sites, if any;
- road access from all major roads in the area;
- road names or numbers of all major roads as well as the roads that provide access to the site(s);
- all roads within a 1km radius of the site or alternative sites; and
- a north arrow;
- a legend; and
- locality GPS co-ordinates (Indicate the position of the activity using the latitude and longitude of the centre point of the site for each alternative site. The co-ordinates should be in degrees, minutes and seconds. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection)

Note from Zutari: The Locality Maps showing both the preferred and alternative sites have been included in Appendix A.

## 1. GRADIENT OF THE SITE

Indicate the general gradient of the site.

Alternative S1:

Flat	1:50 – 1:20	1:20 – 1:15	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5
------	-------------	-------------	-------------	--------------	-------------	------------------

Alternative S2 (if any): *Situated on a hill.*

Flat	1:50 – 1:20	1:20 – 1:15	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5
------	-------------	-------------	-------------	--------------	-------------	------------------

Alternative S3 (if any):

Flat	1:50 – 1:20	1:20 – 1:15	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5
------	-------------	-------------	-------------	--------------	-------------	------------------

## 2. LOCATION IN LANDSCAPE

Indicate the landform(s) that best describes the site:

2.1 Ridgeline		2.6 Plain	X
2.2 Plateau		2.7 Undulating plain / low hills	
2.3 Side slope of hill/mountain		2.8 Dune	
2.4 Closed valley		2.9 Seafront	
2.5 Open valley			

### 3. GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE

Is the site(s) located on any of the following (tick the appropriate boxes)?

	<del>Alternative S1:</del>		Alternative S2 (if any):		Alternative S3 (if any):	
Shallow water table (less than 1.5m deep)	YES	NO	YES	NO	YES	NO
Dolomite, sinkhole or doline areas	YES	NO	YES	NO	YES	NO
Seasonally wet soils (often close to water bodies)	YES	NO	YES	NO	YES	NO
Unstable rocky slopes or steep slopes with loose soil	YES	NO	YES	NO	YES	NO
Dispersive soils (soils that dissolve in water)	YES	NO	YES	NO	YES	NO
Soils with high clay content (clay fraction more than 40%)	YES	NO	YES	NO	YES	NO
Any other unstable soil or geological feature	YES	NO	YES	NO	YES	NO
An area sensitive to erosion	YES	NO	YES	NO	YES	NO

*Note from Zutari (Geotechnical Engineer): No in situ geotechnical investigation information was available at the preferred site. Therefore, key considerations such as the ground profile, material composition and properties, and water level are unknown. Notwithstanding, it is considered unlikely, from a geotechnical perspective, that the alternative site would contain any significant fatal flaws that would inhibit the proposed development. However, aspects similar to those described for the alternative site may also be relevant for the preferred site, such as the presence of collapsible soils and the potential for soil erosion. However, the preferred site appears to have flatter topography, which would potentially reduce the quantities of cuts and fills. The Geotechnical Desktop Study has been included in Appendix D.*

If you are unsure about any of the above or if you are concerned that any of the above aspects may be an issue of concern in the application, an appropriate specialist should be appointed to assist in the completion of this section. (Information in respect of the above will often be available as part of the project information or at the planning sections of local authorities. Where it exists, the 1:50 000 scale Regional Geotechnical Maps prepared by the Council for Geo Science may also be consulted).

### 4. GROUNDCOVER

Indicate the types of groundcover present on the site:

The location of all identified rare or endangered species or other elements should be accurately indicated on the site plan(s).

<del>Natural veld – good condition<sup>E</sup></del>	Natural veld with scattered aliens <sup>E</sup>	<del>Natural veld with heavy alien infestation<sup>E</sup></del>	<del>Veld dominated by alien species<sup>E</sup></del>	Gardens
Sport field	Cultivated land	Paved surface	Building or other structure	Bare soil

If any of the boxes marked with an “E” is ticked, please consult an appropriate specialist to assist in the completion of this section if the environmental assessment practitioner doesn’t have the necessary expertise.

## 5. LAND USE CHARACTER OF SURROUNDING AREA

Indicate land uses and/or prominent features that does currently occur within a 500m radius of the site and give description of how this influences the application or may be impacted upon by the application:

5.1 Natural area	X	5.22 School	
5.2 Low density residential	X	5.23 Tertiary education facility	
5.3 Medium density residential		5.24 Church	
5.4 High density residential		5.25 Old age home	
5.5 Medium industrial <sup>AN</sup>		5.26 Museum	
5.6 Office/consulting room		5.27 Historical building	
5.7 Military or police base/station/compound		5.28 Protected Area	
5.8 Spoil heap or slimes dam <sup>A</sup>		5.29 Sewage treatment plant <sup>A</sup>	
5.9 Light industrial		5.30 Train station or shunting yard <sup>N</sup>	
5.10 Heavy industrial <sup>AN</sup>		5.31 Railway line <sup>N</sup>	
5.11 Power station		5.32 Major road (4 lanes or more)	
5.12 Sport facilities		5.33 Airport <sup>N</sup>	
5.13 Golf course		5.34 Harbour	
5.14 Polo fields		5.35 Quarry, sand or borrow pit	
5.15 Filling station <sup>H</sup>		5.36 Hospital/medical centre	
5.16 Landfill or waste treatment site	X	5.37 River, stream or wetland	
5.17 Plantation		5.38 Nature conservation area	
5.18 Agriculture	X	5.39 Mountain, koppie or ridge	
5.19 Archaeological site		5.40 Graveyard	
5.20 Quarry, sand or borrow pit	X	5.41 River, stream or wetland	X
5.21 Dam or Reservoir		5.42 Other land uses (describe)	

If any of the boxes marked with an "N" are ticked, how will this impact / be impacted upon by the proposed activity?

Not applicable

If any of the boxes marked with an "An" are ticked, how will this impact / be impacted upon by the proposed activity?

If YES, specify and explain:	Not applicable
If NO, specify:	Not applicable

If any of the boxes marked with an "H" are ticked, how will this impact / be impacted upon by the proposed activity.

If YES, specify and explain:	Not applicable
If NO, specify:	Not applicable

## 6. CULTURAL/HISTORICAL FEATURES

Are there any signs of culturally or historically significant elements, as defined in section 2 of the National Heritage Resources Act, 1999, (Act No. 25 of 1999), including Archaeological or palaeontological sites, on or close (within 20m) to the site?	YES	NO
	Uncertain	

If YES, explain: Not applicable

If uncertain, conduct a specialist investigation by a recognised specialist in the field to establish whether there is such a feature(s) present on or close to the site.

Briefly explain the findings of the specialist:

The desktop study revealed that a long and significant history characterises the surroundings of the study area. Additionally, previous archaeological and heritage studies from this area have revealed a number of archaeological and heritage sites from the surroundings of the study area.

Despite the intensive nature of the fieldwork undertaken for this project, no evidence for any heritage sites could be identified.

As no heritage resources were identified during the fieldwork, no impact on identified heritage resources could be assessed. The risk exists for heritage resources not identified during the present fieldwork to be located within the study area. This risk is due to the vegetation cover observed in sections of the study area, and the identification and excavation of Iron Age sites a few kilometres northeast of the study area (Huffman & Steel, 1996).

Will any building or structure older than 60 years be affected in any way?	YES	NO
--	-----	----

Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)?	YES	NO
---	-----	----

If yes, please submit or, make sure that the applicant or a specialist submits the necessary application to SAHRA or the relevant provincial heritage agency and attach proof thereof to this application if such application has been made.

## SECTION C: PUBLIC PARTICIPATION

### 1. ADVERTISEMENT

The person conducting a public participation process must take into account any guidelines applicable to public participation as contemplated in section 24J of the Act and must give notice to all potential interested and affected parties of the application which is subjected to public participation by—



- (a) fixing a notice board (of a size at least 60cm by 42cm; and must display the required information in lettering and in a format as may be determined by the department) at a place conspicuous to the public at the boundary or on the fence of—
  - (i) the site where the activity to which the application relates is or is to be undertaken; and
  - (ii) any alternative site mentioned in the application;
- (b) giving written notice to—
  - (i) the owner or person in control of that land if the applicant is not the owner or person in control of the land;
  - (ii) the occupiers of the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;
  - (iii) owners and occupiers of land adjacent to the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;
  - (iv) the municipal councillor of the ward in which the site or alternative site is situated and any organisation of ratepayers that represent the community in the area;
  - (v) the municipality which has jurisdiction in the area;
  - (vi) any organ of state having jurisdiction in respect of any aspect of the activity; and
  - (vii) any other party as required by the department;
- (c) placing an advertisement in—
  - (i) one local newspaper; or
  - (ii) any official *Gazette* that is published specifically for the purpose of providing public notice of applications or other submissions made in terms of these Regulations;
- (d) placing an advertisement in at least one provincial newspaper or national newspaper, if the activity has or may have an impact that extends beyond the boundaries of the local municipality in which it is or will be undertaken: Provided that this paragraph need not be complied with if an advertisement has been placed in an official *Gazette* referred to in subregulation 54(c)(ii); and
- (e) using reasonable alternative methods, as agreed to by the department, in those instances where a person is desiring of but unable to participate in the process due to—
  - (i) illiteracy;
  - (ii) disability; or
  - (iii) any other disadvantage.

## 2. CONTENT OF ADVERTISEMENTS AND NOTICES

A notice board, advertisement or notices must:

- (a) indicate the details of the application which is subjected to public participation; and
- (b) state—

- (i) that the application has been submitted to the department in terms of these Regulations, as the case may be;
- (ii) whether basic assessment or scoping procedures are being applied to the application, in the case of an application for environmental authorisation;
- (iii) the nature and location of the activity to which the application relates;
- (iv) where further information on the application or activity can be obtained; and
- (v) the manner in which and the person to whom representations in respect of the application may be made.

### **3. PLACEMENT OF ADVERTISEMENTS AND NOTICES**

Where the proposed activity may have impacts that extend beyond the municipal area where it is located, a notice must be placed in at least one provincial newspaper or national newspaper, indicating that an application will be submitted to the department in terms of these regulations, the nature and location of the activity, where further information on the proposed activity can be obtained and the manner in which representations in respect of the application can be made, unless a notice has been placed in any *Gazette* that is published specifically for the purpose of providing notice to the public of applications made in terms of these Regulations.

Advertisements and notices must make provision for all alternatives.

### **4. DETERMINATION OF APPROPRIATE MEASURES**

The practitioner must ensure that the public participation is adequate and must determine whether a public meeting or any other additional measure is appropriate or not based on the particular nature of each case. Special attention should be given to the involvement of local community structures such as Ward Committees, ratepayers associations and traditional authorities where appropriate. Please note that public concerns that emerge at a later stage that should have been addressed may cause the department to withdraw any authorisation it may have issued if it becomes apparent that the public participation process was inadequate.

### **5. COMMENTS AND RESPONSE REPORT**

The practitioner must record all comments and respond to each comment of the public before the application is submitted. The comments and responses must be captured in a comments and response report as prescribed in these Regulations and be attached to this application. The comments and response report must be attached under Appendix E.

### **6. AUTHORITY PARTICIPATION**

Please note that a complete list of all organs of state and or any other applicable authority with their contact details must be appended to the basic assessment report or scoping report, whichever is applicable.

Authorities are key interested and affected parties in each application and no decision on any application will be made before the relevant local authority is provided with the opportunity to give input.

<b>Name of Authority informed:</b>	<b>Comments received (Yes or No)</b>
Mogalakwena Local Municipality (MLM)	No
Waterberg District Municipality (WDM)	No
Department of Water and Sanitation (DWS)	No
National Department of Forestry, Fisheries and the Environment (DFFE)	No
Department of Rural Development and Land Reform (DRDLR)	No
Regional Land Claims Commission	No
Limpopo Department of Sports, Arts and Culture	No
South African Heritage Resources Agency (SAHRA)	No
Roads Agency Limpopo	No
Limpopo Department of Public Works, Roads and Infrastructure	No
Limpopo Heritage Resources Authority (LIHRA)	No
Mapela Traditional Council	No

## 7. CONSULTATION WITH OTHER STAKEHOLDERS

Note that, for linear activities, or where deviation from the public participation requirements may be appropriate, the person conducting the public participation process may deviate from the requirements of that subregulation to the extent and in the manner as may be agreed to by the department.

Proof of any such agreement must be provided, where applicable.

**Has any comment been received from stakeholders?**

<b>YES</b>	<b>NO</b>
------------	-----------

**If “YES”, briefly describe the feedback below (also attach copies of any correspondence to and from the stakeholders to this application):**

---

The draft BAR would be submitted to LEDET together with the application form in order to register the application and elicit comment. At the same time, the draft BAR will go out for public review for the 30 days commenting period.

Interested & Affected Parties will be notified of the release of the report as well as the Basic Assessment process and will be given the opportunity to comment on the Draft BAR. Comments received from the Draft BAR will be addressed and included into the final BAR.

## SECTION D: IMPACT ASSESSMENT

The assessment of impacts must adhere to the minimum requirements in the EIA Regulations, 2014, and should take applicable official guidelines into account. The issues raised by interested and affected parties should also be addressed in the assessment of impacts.

### 1. ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

List the main issues raised by interested and affected parties.

The Draft Basic Assessment Report (BAR) is released for public participation. Interested & Affected Parties will be notified of the release of the report as well as the Basic Assessment process and will be given the opportunity to comment on the Draft BAR. Comments received from the Draft BAR will be addressed and included into the final BAR. The comments and response report would be attached under Appendix E of the final BAR. The commenting period would begin on Monday, 3 October 2023 and end on Thursday, 3 November 2023.

Response from the practitioner to the issues raised by the interested and affected parties (A full response must be given in the Comments and Response Report that must be attached to this report as Annexure E):

The Draft Basic Assessment Report (BAR) is released for public participation. Interested & Affected Parties will be notified of the release of the report as well as the Basic Assessment process and will be given the opportunity to comment on the Draft BAR. Comments received from the Draft BAR will be addressed and included into the final BAR. The comments and response report would be attached under Appendix E of the final BAR. The commenting period would be from Monday, 3 October 2023 until Thursday, 3 November 2023.

### 2. IMPACTS THAT MAY RESULT FROM THE PLANNING AND DESIGN, CONSTRUCTION, OPERATIONAL, DECOMMISSIONING AND CLOSURE PHASES AS WELL AS PROPOSED MANAGEMENT OF IDENTIFIED IMPACTS AND PROPOSED MITIGATION MEASURES

List the potential direct, indirect and cumulative property/activity/design/technology/operational alternative related impacts (as appropriate) that are likely to occur as a result of the planning and design phase, construction phase, operational phase, decommissioning and closure phase, including impacts relating to the choice of site/activity/technology alternatives as well as the mitigation measures that may eliminate or reduce the potential impacts listed.

#### Alternative (preferred alternative)

##### **Direct impacts:**

- Impact on the agricultural environment
- Impact on air quality

- Impact on freshwater biodiversity
- Impact on obstacle limitation surface (OLS) and civil aviation
- Impact on the defense environment
- Impact on the geotechnical environment
- Impact on health resources and environment
- Impact on heritage resources
- Impact on hydrology
- Impact on the socio-economic environment
- Impact on terrestrial biodiversity
- Impact on the visual and landscape environment

***Indirect impacts:***

From a freshwater ecosystem perspective, impacts could materialise in the form of direct and indirect impacts related to the construction of the access road if the alternative site were to be selected for development, or in the event of water treatment residues being discharged into a freshwater ecosystem from the WTW. Should such impacts materialise, cumulative impacts on the freshwater environment would occur. However, it is important to note that both of these impacts can be entirely avoided:

- The impacts associated with the development of the WTW site access road will not materialise if the WTW alternative site is selected for development, as recommended; and
- As recommended in the Freshwater Ecosystem Compliance Report, (found in Appendix D), the impacts related to disposal of water treatment residue into a nearby freshwater ecosystem will not materialise if this material was instead disposed of at a registered landfill site or if it was re-used by mining / agricultural landuses.

With regards to socio-economic impacts, social impacts such as indirect community relations, expectations and economic opportunities.

***Cumulative impacts:***

*Freshwater Ecosystem*

Freshwater ecosystems within the region are under continued threat due to urban and mining related development and expansion, alien invasive vegetation encroachment and pressures associated with land use practices in a communal rural setting. As detailed in the Freshwater Ecosystem Compliance Report (included as Appendix D), no direct and indirect impacts on the nearest freshwater ecosystems are likely to be generated by the either of the WTW development footprint alternatives as the footprints of WTW alternatives will not be located close to any freshwater ecosystem, with the vacant land located between the WTW footprints and the closest freshwater ecosystems providing a high degree of mitigation for any potential indirect or edge impacts.

Residual impacts arise from activities of which the effects persist long after the activity has ceased due to the self-perpetuating nature of such impacts (e.g., erosion). Residual impacts may cease with human remediation or when the trajectory of ecosystem imbalance caused by such an impact is complete. Due to the disturbance of soil and removal of vegetation that will commence with the WTW construction activities, there may be an increase in alien and invasive species entering the system, which may then persist long after construction activities have been



completed. Such proliferation of invasive alien vegetation could eventually affect the closest freshwater ecosystems. It is expected that the impacts associated with the proposed WTW on the freshwater ecosystems in the adjacent area would be unlikely to contribute to residual effects on freshwater ecosystem habitat within the local area provided that cognisant, well-planned design is implemented.

### Social

Based on the combined effects of the proposed WTW, as well as other existing and planned developments in the region, the cumulative impacts are likely to materialize. The identified cumulative impacts include population influx, community health and multiplier effects on the local economy. It is envisioned that population influx if not managed adequately is likely to place significant pressure on local resources, services, and infrastructure, as well as the formation of informal settlements. Nevertheless, the proposed WTW and other developments in the region may result in economic benefits for the local communities through direct and multiplier effects.

### Agricultural

Agricultural land throughout South Africa is under inevitable pressure from various non-agricultural land uses. The cumulative impact of agricultural land loss is significant. However, the agricultural priority should be to conserve future agricultural production, not simply agriculturally zoned land. As discussed in the Agricultural Compliance Statement (included as Appendix D), the development site has limited current agricultural production and limited capacity for future agricultural production. Therefore, it is a site which can be used for non-agricultural purposes without a high loss of agricultural production potential. The cumulative agricultural impact of the proposed development is therefore assessed as being of low significance and therefore as acceptable. The development will not have an unacceptable negative impact on the agricultural production capability of the area, and it is therefore recommended, from a cumulative agricultural impact perspective, that the development be approved.

### Visual

Based on the findings of the visual assessment, the proposed WTW is expected to have a minimal visual impact on the receiving environment. It is therefore the opinion of the specialist that the project be considered favourably from a visual resource management perspective

### Flora

For the assessment of potential cumulative impacts to vegetation and plant species associated with the proposed activities, consideration was given to past, present, and future (known) projects and natural drivers that affect these aspects. Three areas of concern were identified:

- Habitat fragmentation: The focus area is not currently fragmented locally but is surrounded by anthropogenic developments within the larger area. Historically, the focus area was fragmented by agricultural practices. Additional fragmentation of this area will result in cumulative impacts to floral communities but will be more severe for the Mokopane WTW than the Alternative WTW given that the Mokopane WTW is associated with a small landscape corridor.
- Vegetation harvesting (wood collection and medicinal species collection): Considering the extent of anthropogenic activities surrounding this area, as well as the number of NFA-protected trees, additional pressures from wood harvesting is anticipated if this project proceeds.

- Spread of AIPs: The focus area is not currently associated with high diversities or abundances of AIPs – however, several NEMBA category 1b invaders were noted along the existing road and existing landfill. If AIPs are not managed and are allowed to spread to adjacent areas, there is a risk of cumulative degradation of floral communities within the area.
- Additional (known) planned projects in the area: No additional projects are known to be proposed for the site at this stage.

Overall, the resultant cumulative impacts to the floral habitat and diversity are anticipated to be moderately detrimental.

#### Faunal

The focus area is situated in a region which has been impacted through various anthropogenic activities such as urban expansion, farming, the waste disposal facility adjacent to the focus area etc. All of these activities have led to the reduction of natural areas within the region impacting on faunal communities, reducing diversity and abundance. Faunal species found within these natural areas are already under pressure and further habitat reduction will lead to faunal species being further displaced into the adjacent habitats. This may lead to increased competition for space and food resources in an already degraded environment which could lead to further decline in numbers in the region.

Edge effects and AIP proliferation are more concerning over the long-term. AIP proliferation will ultimately lead to loss of viable habitat in the surrounding areas, displacing faunal species further as indigenous floral species (faunal habitat and food resources) are displaced and lost.

### **3. ENVIRONMENTAL IMPACT STATEMENT**

Taking the assessment of potential impacts into account, please provide an environmental impact statement that summarises the impact that the proposed activity and its alternatives may have on the environment after the management and mitigation of impacts have been taken into account, with specific reference to types of impact, duration of impacts, likelihood of potential impacts actually occurring and the significance of impacts.

#### **Alternative A (preferred alternative)**

This Section provides a summary of the specialist inputs, and include an assessment of the identified environmental impacts, key mitigations, and recommendations. For a detailed baseline environment and impact assessment, refer to the agricultural study found in Appendix D.

### **3.1. AGRICULTURAL IMPACTS (JOHANN LANZ, 2023)**

Zutari commissioned Johann Lanz to undertake agricultural compliance statement for the proposed Mokopane WTW. The compliance statement was undertaken in September 2023.

#### **1. Introduction**

The purpose of the agricultural assessment is to answer the following question: will the proposed development cause a significant reduction in agricultural production potential, and most importantly, will it result in a loss of arable land?

The project will cause the permanent exclusion of any potential future agricultural production from the entire footprint of the development. Once agriculture is excluded, there can be no further on-site agricultural impact. There is also no off-site agricultural impact. The details of the context of this facility within the greater project and the details of the design and layout of the facility is therefore of no relevance to agricultural impacts and it is unnecessary to consider it any further in this assessment. All that is of relevance is the loss of the footprint (2.2 ha) to potential future agricultural production.

#### **2. Impacts assessment**

An agricultural impact is a change to the future agricultural production potential of land. This is primarily caused by the exclusion of agriculture from the footprint of a development. In this case, the total footprint of land from which potential future agriculture will be excluded, is only approximately 2.2 hectares and it is not viable cropland. The loss of this amount of grazing land, of which there is no particular scarcity in the country, will result in negligible loss of agricultural production potential in terms of national food security. The agricultural impact of the proposed development is therefore assessed as being of very low significance and acceptable.

The classified land capability of the alternative site ranges from 3 to 5 (The road includes land rated up to 8). This assessment verifies that the site is not within crop boundaries and verifies the classified land capability, based on the assessment of the cropping potential of the site. This assessment therefore confirms the low to medium sensitivity rating by the screening tool.

The classified land capability of the preferred site ranges from 8 to 10. This assessment disputes the classified land capability of >7, based on the assessment in this report that the site is unsuitable for viable rain-fed crop production (see following section). The appropriate land capability of land that is unsuitable for viable rain-fed crop production is  $\leq 7$  because the relationship between land capability and agricultural production potential is such that a land capability of >7 should denote land that is suitable for viable rain-fed crop production. This assessment therefore disputes the high sensitivity rating by the screening tool that is based on a classified land capability of >8 and rates the entire proposed site as being of medium agricultural sensitivity with a maximum land capability of 7. This assessment therefore disputes the high sensitivity rating by the screening tool of the preferred site and rates it as being of medium agricultural sensitivity. Note that the low to medium sensitivity of the alternative site is confirmed.



**Figure 2.** The preferred development footprint (light blue outline) and alternative (dark blue outline) overlaid on agricultural sensitivity, as given by the screening tool (green = low; yellow = medium; red = high; dark red = very high). The screening tool's high sensitivity is disputed by this assessment, which rates the entire assessed area as being of medium agricultural sensitivity.

### 3. Conclusion

The project may require agricultural approval (or at least comment from Department of Agriculture) as part of the required approval in terms of applicable municipal land use legislation, as well as in terms of the Subdivision of Agricultural Land Act (Act 70 of 1970 - SALA), if the property is currently zoned for agriculture.

Of the two proposed sites, the preferred site is on somewhat better potential agricultural land and therefore has higher agricultural impact. The alternative site is therefore preferred if assessed purely from an agricultural impact perspective.

The overall conclusion of this assessment is that the agricultural impact of the proposed development is negligible because it leads to no loss of potential cropland and negligible loss of future agricultural production potential. From an agricultural impact point of view, it is recommended that the proposed development be approved. The conclusion of this assessment on the acceptability of the proposed development and the recommendation for its approval is not subject to any conditions.

### **3.2. GEOTECHNICAL INVESTIGATION (ZUTARI, 2023)**

The desktop geotechnical investigation was undertaken by Zutari (Pty) Ltd, and the full report is included in Appendix D. The intention of the geotechnical desktop study was to provide a site sensitivity verification assessment of the site as it pertains to the EA process. The desktop study therefore focused on the geotechnical aspects of the site from an environmental perspective. The assessment was limited to a desktop study only and no site walk-over was conducted.

#### **1. Baseline environment**

The description of the environmental baseline has been informed by specialist studies undertaken, particularly the information from the geotechnical investigation.

#### **2. Site Geology**

The geological setting of the proposed Mokopane water treatment works is shown in the extract of the 1:50 000 geological sheet 2429AA Mokopane in Figure 3. According to the 1:50 000 geological sheet, the primary site is underlain by formations of the Vaalian age, all of which fall under the Transvaal Supergroup, Pretoria Group. The formations in the vicinity of the primary site are listed below, noting that the footprint of the site is situated on Vdw, Vst and Vti1 according to the map:

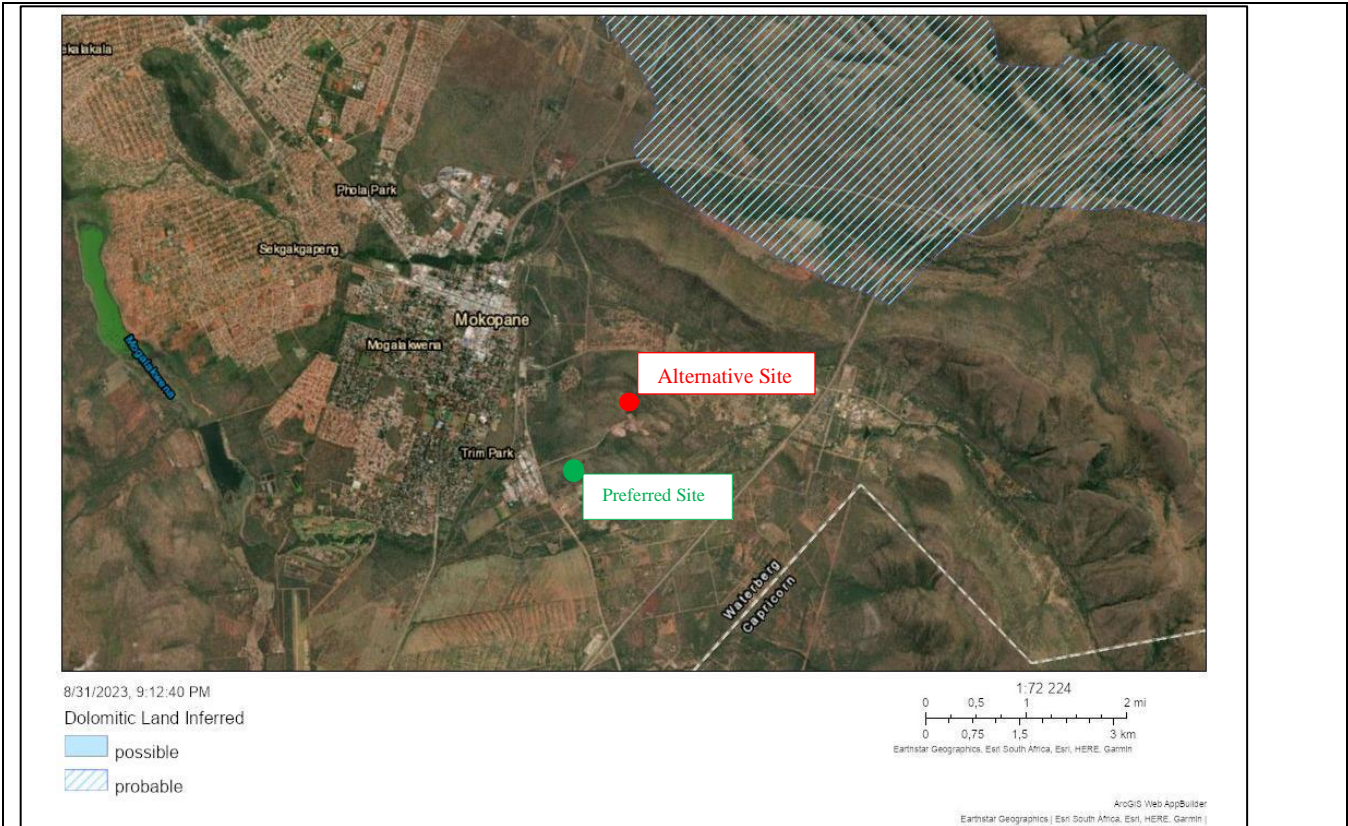
- Q-r: Soil
- Vbn: Andalusite-biotite schist of the Silverton Formation.
- Vdp: Quartzite of the Daspoort Formation.
- Vst: Biotite schist of the Strubenkop Formation.
- Vdw: Greyish white quartzite with basal pebbly conglomerate of the Daalheuwel Formation.
- Vti1: Basal carbonaceous shale, andalusite-staurolite fels, pelites of the Timeball Hill Formation

Towards the southwest, the preferred site is situated on Quaternary-aged soils (Q-r), in close vicinity to basaltic volcanoclastic rocks (Vmc) of the Silverton Formation. A prominent fault line is located approximately 1.0 to 1.5km west of the proposed and alternative sites. The fault strikes in the north-northeast to south-southwest direction. Towards the east, an inferred fault line strikes in the northwest to southwest direction. No prominent regional-scale fault lines are present within the area of interest.

The sites are not underlain by potentially soluble rock such as dolomite. However, for reference, as shown in Figure 3, the Council for Geoscience (2023) indicates that there is probable dolomitic rock located approximately 5 – 7 km northeast of the alternative site. It is likely that the probable dolomitic land refers to the Malmani dolomites of the Chuniespoort Group approximately 7 km northeast of the alternative site. Notwithstanding, the dolomite is a considerable distance away from the sites and is not considered a risk for the current sites.







**Figure 4.** Inferred dolomitic risk map in the Limpopo Province South Africa (Council for Geoscience, 2023)

### 3. Climate

The Weinert N-value (Weinert, 1980) is an index used to estimate the effect of climate on the rock weathering process. In general, where the N-value is more than 5, disintegration (mechanical weathering) is the dominant form of weathering, and the residual soils are typically only thinly developed. Conversely, where the N-value is less than 5, there is a water surplus and decomposition (chemical weathering) is dominant, typically creating conditions that are favourable for the development of deeper residual soil profiles.

As indicated in Figure 4, the site is situated in an area with a Weinert N-value in the order of  $N=3.3$  (Weinert, 1980). Decomposition (chemical weathering) is therefore the expected mode of weathering at the site, and deeper residual profiles may have resulted over time.



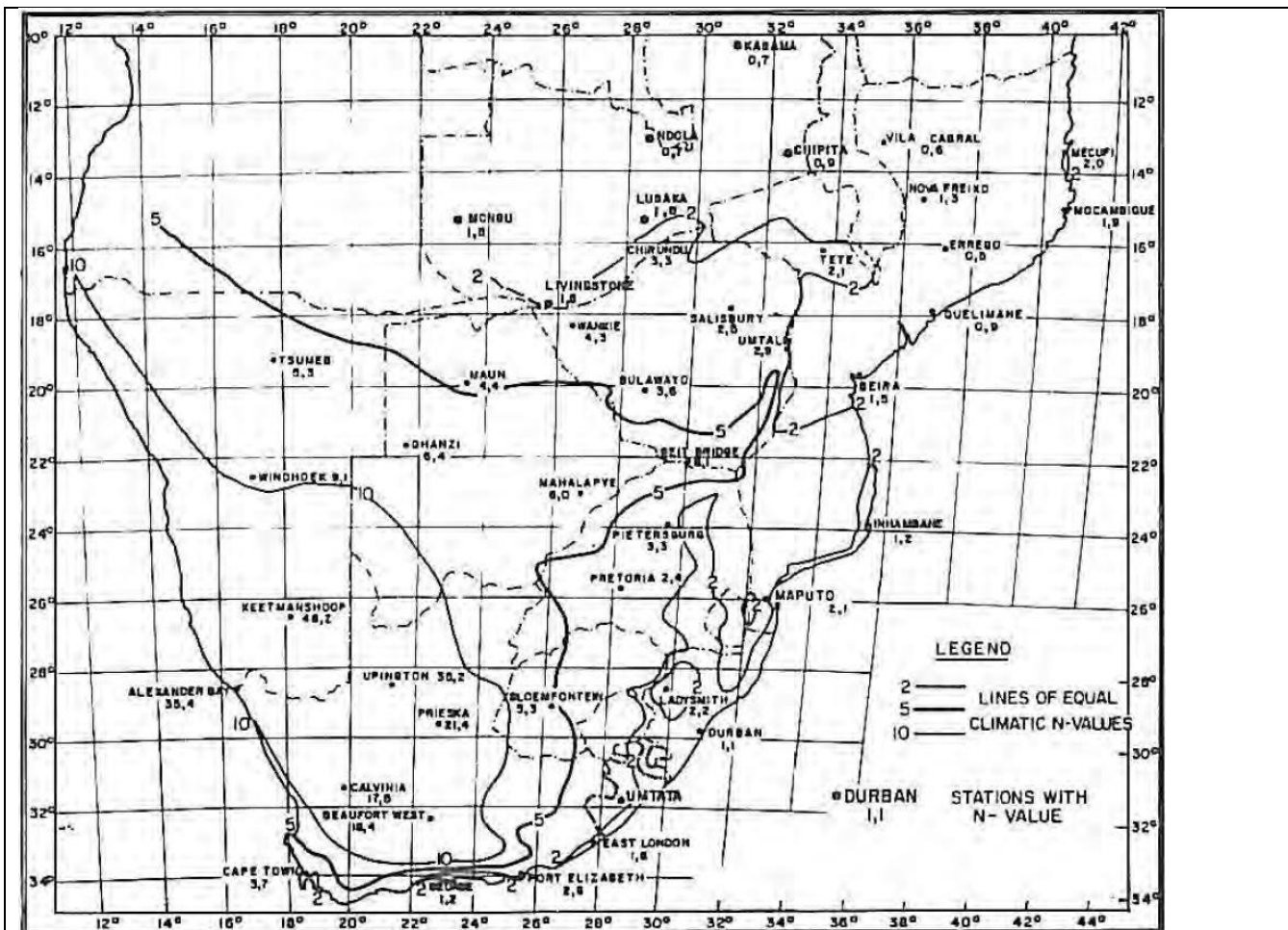
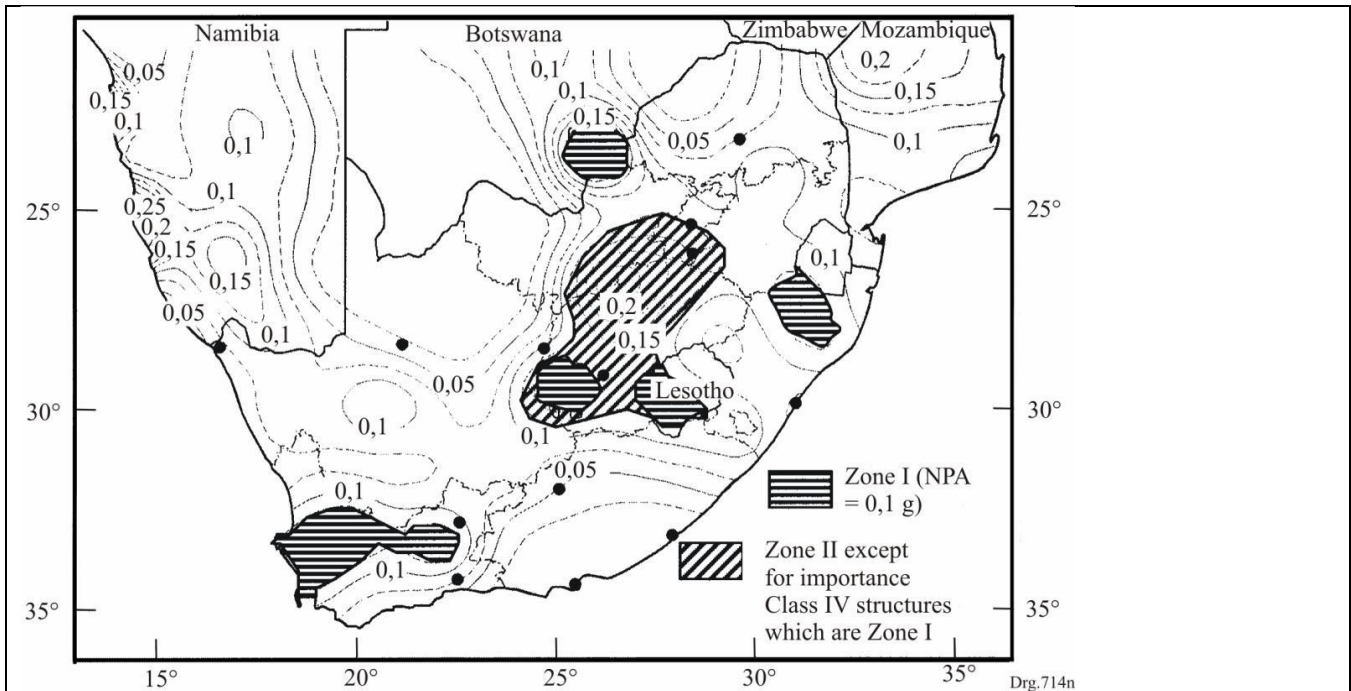


Figure 5. Contour map of climatic N-values for Southern Africa (Weinert, 1980)

#### 4. Seismicity

The South African loading code, SANS 10160-4:2011 (SABS, 2011), suggests that the site is not located in a highly seismic hazard zone (Figure 5). However, as indicated in Figure 5, the site may nonetheless experience a peak ground acceleration in the order of 0.05g to 0.075g. The probability of exceedance of this peak ground acceleration is 10% in a 50-year period.

In 2016 WSM Leshika Consulting conducted Geological Investigation for the proposed alternative site. The details of the findings (i.e. soil profile, groundwater, laboratory test results, and considerations) are presented in the desktop geotechnical investigation, included in Appendix D.



**Figure 5.** SANS 10160-4:2011 seismic hazard map of South Africa showing peak ground acceleration with 10% probability of being exceeded in a 50-year period (SABS, 2011).

## 5. Conclusions and Recommendations

A geotechnical desktop study was conducted for the proposed primary and alternative sites of the Mokopane water treatment works. From the published 1:50 000 geology map of the region, the geology of the primary site is expected to comprise greyish white quartzite, and possible biotite schist and basal carbonaceous shale. The geology map indicates that the alternative site comprises Quaternary-aged soils. No potentially soluble rock like dolomite is present for either site.

Shallow test pitting from a previous geotechnical investigation at the alternative site encountered the presence of shallow rock, within approximately 0.5 m below ground level. This presents favourable conditions for founding of the infrastructure, but difficult excavation conditions that may require blasting. Additionally, a pinholed soil structure was identified in the upper soil cover, which may require removal and recompaction to avoid collapse settlement of the proposed infrastructure, however this is considered feasible because the soil layer is relatively thin. Furthermore, due to the steep topography, cuts and fills may be required at both the alternative site and its access road, which will require slope stability assessments and possible lateral support. Notwithstanding, from a geotechnical perspective, no fatal flaws that would inhibit the proposed development were identified at the alternative site.

No in-situ geotechnical investigation information was available at the preferred site, and hence the ground conditions are unknown. Considering that the geological map indicates the presence of Quaternary-aged soils, the preferred site may have a deeper soil profile than what was encountered at the alternative site. Notwithstanding, it is considered unlikely, from a geotechnical perspective, that the preferred site would contain any significant fatal flaws that would inhibit the proposed development. However, aspects similar to those described for the alternative site may also be relevant for the preferred site, such as the presence of collapsible soils, stability of cuts/fills, and the potential for soil erosion. Considering that the preferred site may have a deeper soil profile, the site may have less favourable founding conditions and it may not be practical to remove and replace collapsible soils (if present), and thus another type of ground improvement may be required. Potential advantages of the preferred site include

its flatter topography, which would potentially reduce the quantities of cuts and fills, and easier excavation conditions if it contains a deeper soil profile.

Given the limited nature of the geotechnical information at the sites, additional geotechnical investigations would be required to reduce the geotechnical risk of the project as it moves into subsequent design phases, particularly at the preferred site where no intrusive information is currently available. To provide sufficient information for the geotechnical design of the foundations and slopes at the facility, it is recommended that further geotechnical investigation work be undertaken at the selected site, such as site walkovers with mapping of rock outcrops, excavating of test pits, drilling of rotary core boreholes, and laboratory testing. The quantity and extent of the geotechnical investigation will take into consideration the chosen site, the details of the infrastructure, and the stage of development, be it feasibility or concept design or detailed design.

### **3.3. DEFENSE IMPACTS (PARIVISION, 2023)**

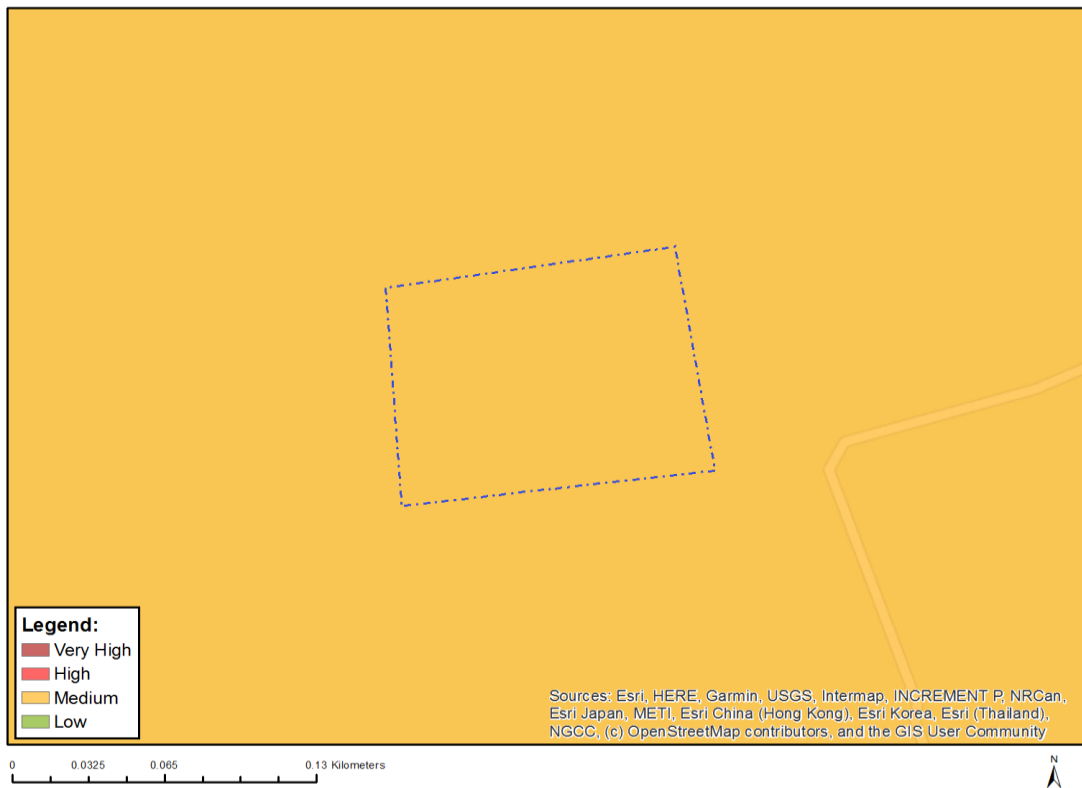
In September 2023 Parivision compiled a defence site sensitivity verification for the proposed WTW, and this report is included in Appendix D.

The scope of the assessment at Mokopane necessitates a comprehensive Defence Theme Impact Assessment, which encompasses the evaluation of three distinct options. The primary focus of this assessment revolves around the Preferred Site, denoted as Site 2, which will be thoroughly examined for its suitability and potential impacts. Additionally, the assessment will also scrutinize the Alternative Site, designated as Site 1, to assess its feasibility and compare it to the preferred option. Lastly, the assessment will encompass the No Go alternative, exploring the implications of not pursuing the project at all.

#### **1. Defence Site Sensitivity Verification Results**

This section will present a summary of the findings of the site sensitivity assessment for the Defence theme as sourced from the Department of Environmental Affairs Screening Tool.

Figure 6 below shows the alternative site (i.e, site 1).



**Figure 6. Screening Tool Map Assessed Area for Site 1 (alternative site)**

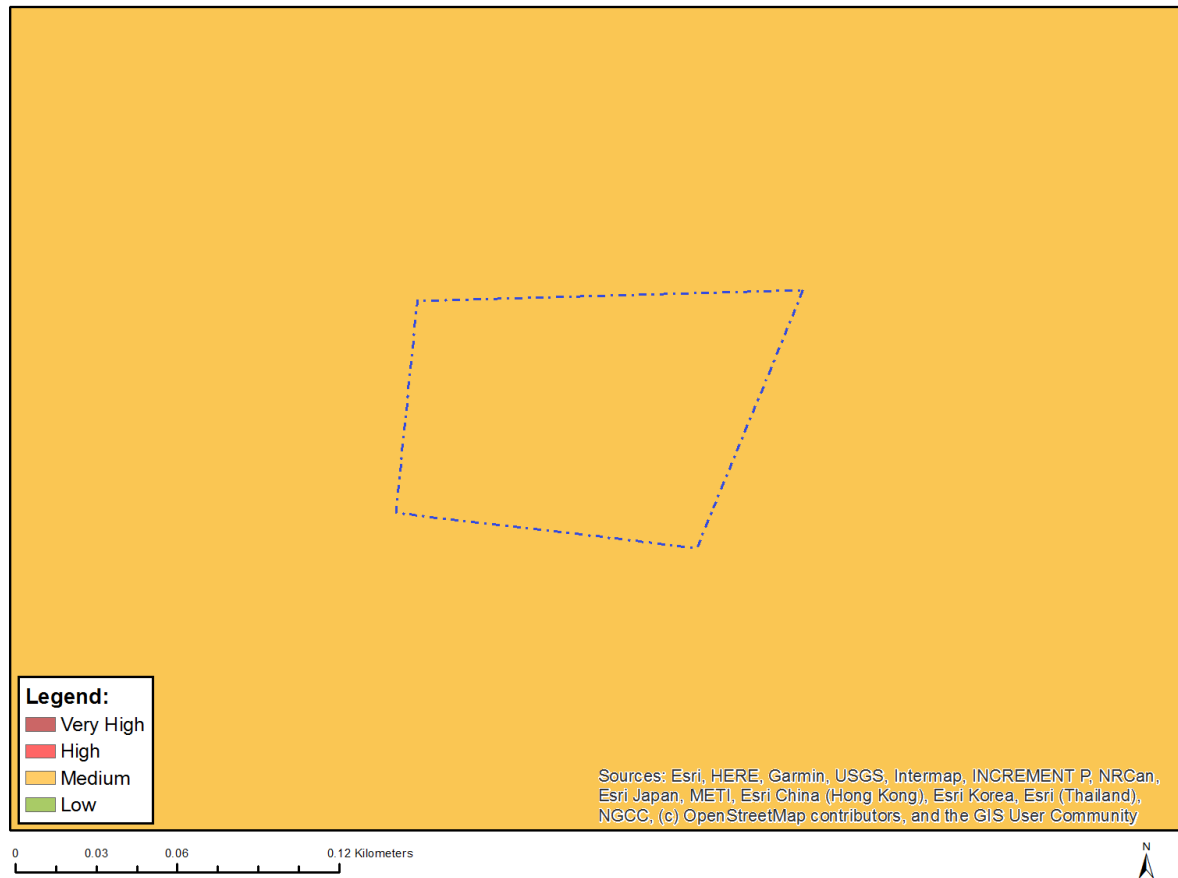
The table below shows a summary of the assessment for Site 1 (alternative site).

**Table 1. Screening Tool Map Assessed Area for Site 1**

Aspect	Definition
Findings	The proposed project site is dominated by natural vegetation and there are no areas of cultivation present on site. No defence installations were found within the proposed project assessed area. According to the Visual Impact Assessment, much of the area is characterised by natural vegetation which is dominated by a mix of the winter-deciduous mopane tree and other species such as Acacia tortillis and A. mellifera.
Sensitivity	Medium
Sensitivity Features	Military and Defence site

Figure 7 below shows the preferred site (i.e., site 2).





**Figure 7.** Screening Tool Map Assessed Area for Site 2.

Table 2 below shows a summary of the assessment for preferred site.

**Table 2.** Screening Tool Map Assessed Area for the preferred site

Aspect	Definition
Findings	The proposed project site is dominated by natural vegetation and there are no areas of cultivation present on site. No defence installations were found within the proposed project assessed area. According to the Visual Impact Assessment, much of the area is characterised by natural vegetation which is dominated by a mix of the winter-deciduous mopane tree and other species such as <i>Acacia tortillis</i> and <i>A. mellifera</i> .
Sensitivity	Medium
Sensitivity Features	Military and Defence site

## 2. Conclusion

Based on the comprehensive Defence Site Sensitivity Verification process, the project site has been confirmed to align with the environmental sensitivity ratings provided by the national web-based screening tool. This verification process has ensured that the Mokopane Water Treatment Project is in compliance with the regulatory requirements outlined in Government Notice No. 320, GOVERNMENT GAZETTE 43110, published on 20th March 2020.

The radar specialist recommended that the preferred site be developed.

### 3.4. INITIAL OBSTACLE LIMITATION SURFACE ASSESSMENT (PARIVISION, 2023)

In September 2023, Zutari conducted the Limitation Surface (OLS) and civil aviation assessment. The Initial OLS Compliance Report is attached in Appendix D.

The intent of this report is to communicate the findings of a conceptual Obstacle Limitation Surface (OLS) assessment conducted to determine any foreseeable airspace/ civil aviation aerodrome impact posed by the new Mokopane and Sekuruwe Water Treatment Works,

Below is the summary of the findings and recommendations.

Figure 8 and Figure 9 illustrate the planned infrastructure footprint overlaid on the civil aviation sensitivity map as generated by the DFFE screening tool for the Potgietersrus Airport and the Shikwaru Lodge airfield respectively.

MAP OF RELATIVE CIVIL AVIATION THEME SENSITIVITY



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
	X		

**Sensitivity Features:**

Sensitivity	Feature(s)
High	Within 8 km of other civil aviation aerodrome
High	Dangerous and restricted airspace as demarcated
Medium	Between 15 and 35 km from a civil aviation radar

Figure 8. Map of relative civil aviation theme sensitivity – Preferred Site (DFFE Screening Report)

MAP OF RELATIVE CIVIL AVIATION THEME SENSITIVITY



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
	X		

Sensitivity Features:

Sensitivity	Feature(s)
High	Dangerous and restricted airspace as demarcated

**Figure 9. Map of relative civil aviation theme sensitivity – Alternative site (DFFE Screening Report)**

Findings illustrated in Figure 8 indicate a high sensitivity feature of the planned infrastructure in relation to Potgietersrus Airport being within 8km of the aerodrome. Our analysis shows agreement with high sensitivity with the aerodrome due to the proximity

The OLS assessment conducted however anticipates no interaction between the proposed Mokopane sites and the OLS of Potgietersrus Airport.

Furthermore, no OLS protrusions are anticipated at Shikwaru Lodge airfield due to the distance, ~13.6 km, and the high-level OLS analysis conducted.

**1. Conclusion**

Although the planned infrastructure falls within the high sensitivity rating for the proposed site being within 8km of a civil aviation aerodrome, the specialist however, concluded that it is not foreseen that these civil aviation installations are impacted by the planned activities with consideration of the OLS of the Potgietersrus Airport and the Shikwaru Lodge airfield.

### **3.5. HERITAGE IMPACT ASSESSMENT (PGS HERITAGE, 2023)**

During September 2023, Zutari commissioned PGS Heritage to undertake a Heritage Impact Assessment (HIA) for the proposed Mokopane WTW. The comprehensive HIA Report can be found in Appendix D.

Below is the summary of the findings and recommendations.

#### **1. Desktop study**

A detailed archaeological and historical review of the project area and surrounding landscape was undertaken. This was augmented by a study of available historical and archival maps and an assessment of previous archaeological and heritage studies completed for the area. The desktop study revealed that a long and significant history characterises the surroundings of the study area. Additionally, previous archaeological and heritage studies from this area have revealed a number of archaeological and heritage sites from the surroundings of the study area.

The detailed baseline information and site description can be found in the HIA report, included as Appendix D.

#### **2. Impact Assessment**

As no heritage resources were identified during the fieldwork, no impact on identified heritage resources could be assessed. The risk exists for heritage resources not identified during the present fieldwork to be located within the study area. This risk is due to the vegetation cover observed in sections of the study area, and the identification and excavation of Iron Age sites a few kilometres northeast of the study area (Huffman & Steel, 1996).

The following impact risk can, therefore, be identified in the table below:

**Table 3. Assessment of the Impact on Presently Unknown Heritage Resources**

Project phase	Construction	
Impact	Impact on Presently Unknown Heritage Resources	
Description of impact	Destruction / Damage to Presently Unknown Heritage Resources	
Mitigability	High	Mitigation exists and will reduce the significance of impacts
Potential mitigation	See below	
Assessment	Without mitigation	With mitigation
Nature	Negative	Negative
Duration	Long-term	Medium-term
Extent	Regional	Regional
Intensity	High Negative	Moderate Negative
Consequence	Highly detrimental	Moderately detrimental
Probability	Fairly likely, i.e. could happen	Unlikely

Significance	Moderate - negative	Low - negative
--------------	---------------------	----------------

The impact assessment undertaken in Table 3 has revealed that the significance of the unmitigated impact risk in terms of the destruction of presently unknown heritage resources is expected to be of Moderate (Negative) Significance. The assessment has also indicated that the impact risk is expected to be of Low (Negative) Significance once mitigation is completed. This calculation clearly indicates that mitigation would be required.

**3. Mitigation**

As no heritage resources were identified during the fieldwork, no impact assessment calculations could be undertaken to assess the impact of the proposed development on identified heritage sites. However, the risk was identified for presently unknown heritage resources to be destroyed during construction activities. Mitigation measures would be required to address the identified impact risk.

The following mitigation measures are required:

- An archaeological watching brief must be implemented during the construction phase. This watching brief is aimed at monitoring the construction and excavation work for any archaeological deposits and features which may be exposed during these development activities.

**4. Conclusion**

Despite the intensive nature of the fieldwork undertaken for this project, no evidence for any heritage sites could be identified.

The archaeological specialist concluded from a heritage point of view, no heritage reasons can be given for the development not to continue, provided that general recommendations and mitigation measures outlined in the attached HIA report are adhered to and in cognisance of the assumptions and limitations contained in the report.

**3.6. PALAEOLOGICAL IMPACTS (BANZAI ENVIRONMENTAL, 2023)**

Banzai Environmental was commissioned, by PGS Heritage, to conduct the Palaeontological Desktop Assessment (PDA). This PDA is required to confirm whether fossil material may potentially be present in the planned development area and to assess the potential impact of the proposed development on the local palaeontological heritage in order to comply with the NHRA (section 38).

The complete geological and paleontological history of the site is contained the PDA (Appendix D). PDA forms part of the HIA.

**1. Findings and Recommendation**

The rating system is applied to the potential impacts on the receiving environment and includes an objective evaluation of the mitigation of the impact. In assessing the significance of each impact, the following criteria is used:

**Table 1: The rating system**

Project phase	Construction
Impact	Impact on Presently Unknown Fossil Heritage Resources

Description of impact	Destruction / Damage to Presently Unknown Heritage Resources	
Mitigability	High	Mitigation exists and will reduce the significance of impacts
Potential mitigation	See below	
Assessment	Without mitigation	With mitigation
Nature	Negative	Negative
Duration	Long-term	Long-term
Extent	Site	Site
Intensity	High Negative	Low Negative
Consequence	Highly detrimental	Moderately detrimental
Probability	Fairly likely, i.e. could happen	Unlikely
Significance	Moderate - negative	Low - negative

The proposed Mokopane Water Treatment Works is underlain by the Silverton and Daspoort Formations, (Pretoria Group, Transvaal Supergroup). According to the PalaeoMap of the South African Heritage Resources Information System (SAHRIS) the Palaeontological Sensitivity of the Silverton Formation (Pretoria Group, Transvaal Supergroup) is HIGH, while that of Daspoort Formation is LOW. The geology has recently been updated (Council of Geosciences, Pretoria) and indicates that the proposed study area is underlain by the Silverton Formation (Pretoria Group, Transvaal Supergroup) as well as The Timeball Hill and Rooihogte Formations.

The preferred site, located in the Silverton Formation (with a High Palaeontological Sensitivity), has been suggested for the WTW but as fossils from the Pretoria Group are known to be microfossils a Low Palaeontological Significance has been allocated to the development footprint. The palaeontologist concluded that the proposed development will not lead to damaging impacts on the palaeontological resources of the area. The construction of the development may thus be permitted in its whole extent, as the development footprint is not considered sensitive in terms of palaeontological resources.

Importantly, if fossil remains are discovered during any phase of construction, either on the surface or exposed by excavations the Chance Find Protocol must be implemented by the Environmental Control Officer (ECO) or site manager in charge of these developments. These discoveries ought to be protected (if possible, in situ) and the ECO or site manager must report to South African Heritage Resources Agency (SAHRA).

Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Tel: 021 462 4502. Fax: +27 (0)21 462 4509. Web: [www.sahra.org.za](http://www.sahra.org.za)) so that mitigation (recording and collection) can be carry out by a paleontologist.

Preceding any collection of fossil material, the specialist would need to apply for a collection permit from SAHRA. Fossil material must be curated in an accredited collection (museum or university collection), while all fieldwork and reports should meet the minimum standards for paleontological impact studies suggested by SAHRA.



## **2. Chance Find Procedure**

The following procedure applies:

- If a chance find is made the person responsible for the find must immediately stop working and all work that could impact that finding must cease in the immediate vicinity of the find.
- The person who made the find must immediately report the find to his/her direct supervisor which in turn must report the find to his/her manager and the ESO or site manager. The ESO or site manager must report the find to the relevant Heritage Agency (South African Heritage Research Agency, SAHRA). (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Tel: 021 462 4502. Fax: +27 (0)21 462 4509. Web: [www.sahra.org.za](http://www.sahra.org.za)). The information to the Heritage Agency must include photographs of the find, from various angles, as well as the GPS co-ordinates.
- A preliminary report must be submitted to the Heritage Agency within 24 hours of the find and must include the following: 1) date of the find; 2) a description of the discovery and a 3) description of the fossil and its context (depth and position of the fossil), GPS co-ordinates.
- Photographs (the more the better) of the discovery must be of high quality, in focus, accompanied by a scale. It is also important to have photographs of the vertical section (side) where the fossil was found.
- Upon receipt of the preliminary report, the Heritage Agency will inform the ESO (or site manager) whether a rescue excavation or rescue collection by a palaeontologist is necessary.
- The site must be secured to protect it from any further damage. No attempt should be made to remove material from their environment. The exposed finds must be stabilized and covered by a plastic sheet or sand bags. The Heritage agency will also be able to advise on the most suitable method of protection of the find.
- If the fossil cannot be stabilized the fossil may be collected with extreme care by the ESO. Fossils finds must be stored in tissue paper and in an appropriate box while due care must be taken to remove all fossil material from the rescue site.
- Once the Heritage Agency has issued the written authorization, the developer may continue with the development on the affected area.

### **3.7. HYDROLOGICAL ASSESSMENT (ZUTARI, 2023)**

Zutari conduct the Hydrological Impact Assessment, and this assessment focuses on the impact of the proposed WTWs on the surface runoff as well as the potential impact of nearby flow paths or streams on the sites.

The complete Hydrological Impact Assessment can be found in Appendix D.

#### **1. Introduction**

The runoff volumes and 1-100-year flood line modelling was done using the 30x30m contours available from the Chief Directorate: National Geo-spatial Information (CDNGI) website. It is therefore pertinent to note that the details contained in this report is for information only and is not suitable to use for design.

The preferred site is within the Pretoria Group sediments, but the site is on shales and likely to have a fairly thick soil profile. The site has a flow path that runs next to the existing road.

The proposed alternative site is located on a ridge which is quite steep. The vegetation on the site is shrubs and grassland. The site slopes to the southwest towards the existing landfill. The ridge is part of the Pretoria Group sediments and is quartzite/conglomerate rock which may be difficult to excavate.

## **2. Surface Water Impacts and Mitigations**

The high-level flood line presented in this report is to be used for information purposes only and not for detailed design. It is recommended that a flood risk assessment be compiled in conjunction with a stormwater management plan to determine the impact to on-site runoff of developing a WTW on the site.

Based on the findings of this study, the following can be recommended to reduce the risk of flooding from the watercourses at the preferred Mokopane WTW site:

The Mokopane WTW site would be inundated in a 1-100-year flood.

There are two options available:

- Raise the infrastructure above the flood level, and,
  - Construct channels from an appropriately selected material based on the velocity and depth to divert flows around the site.
  - Compile a flood risk assessment using the designed channel and reshaped flow path to determine the lateral extent of the 1-100-year flood. It is recommended that the footprint of the WTW does not extend into the remodelled flood line.
- Moving the proposed site across the road in the north-east direction, and,
  - Install berms and cutoff drains on the upstream edge of the proposed WTW building and road footprints to divert runoff and protect from flooding.
  - Infiltration testing should be conducted as part of the geotechnical investigation to assess the suitability of designing and installing infiltration-related sustainable drainage systems to manage stormwater runoff generated by the developed site.

## **3. Recommendations**

The following recommendations are made based on the findings of the HIA and municipal standards for the design of the stormwater management system:

Provision for attenuation of stormwater will need to be made within the site and attenuation or infrastructure will not be permitted within the 1:100 year flood line or within the delineated wetland or riparian zone or associated buffers.

A stormwater management plan must be submitted for approval by the relevant authorities prior to construction approval. The plan must meet the following standards:

- Peak discharge must not increase for any event of any duration up to the 25-year RI event.
- Volume of runoff must not increase up to the annual 10-year rainfall.
- No surface runoff for the 1-year RI event of any duration.
- No deterioration of water quality.

The stormwater management plan and design should meet the following objectives:

- Reproduce as closely as possible the hydrological conditions at the point of discharge that existing prior to the development of the site.
- Provide for removal of most urban pollutants.
- Have a neutral to positive impact on the natural and human environment.

The stormwater management plan should also minimise the generation of surface runoff and stormwater through adopting the principles of Water Sensitive Urban Design (WSUD) and Sustainable Urban Drainage Systems (SUDS). The WSUDs and SUDS can be used to manage the impacts of urban development of the water cycle as an alternative or supplement to traditional 'end of pipe' techniques, and typically include techniques relating to stormwater conveyance, receiving water protection, and water usage and recycling, to reduce the negative impacts or urban development on the water cycle.

To minimise surface runoff and to maintain water quality, consideration should be given to:

- The use of bioretention ponds,
- Enhances swales and grass lined channels,
- Stone fille infiltration ditches (dependent on geotechnical investigation and the lack of dolomite), and,
- Permeable paving.

The layout and associated stormwater management plan should optimise opportunities for linking the water cycle and integrating engineering, water conservation, and greening through:

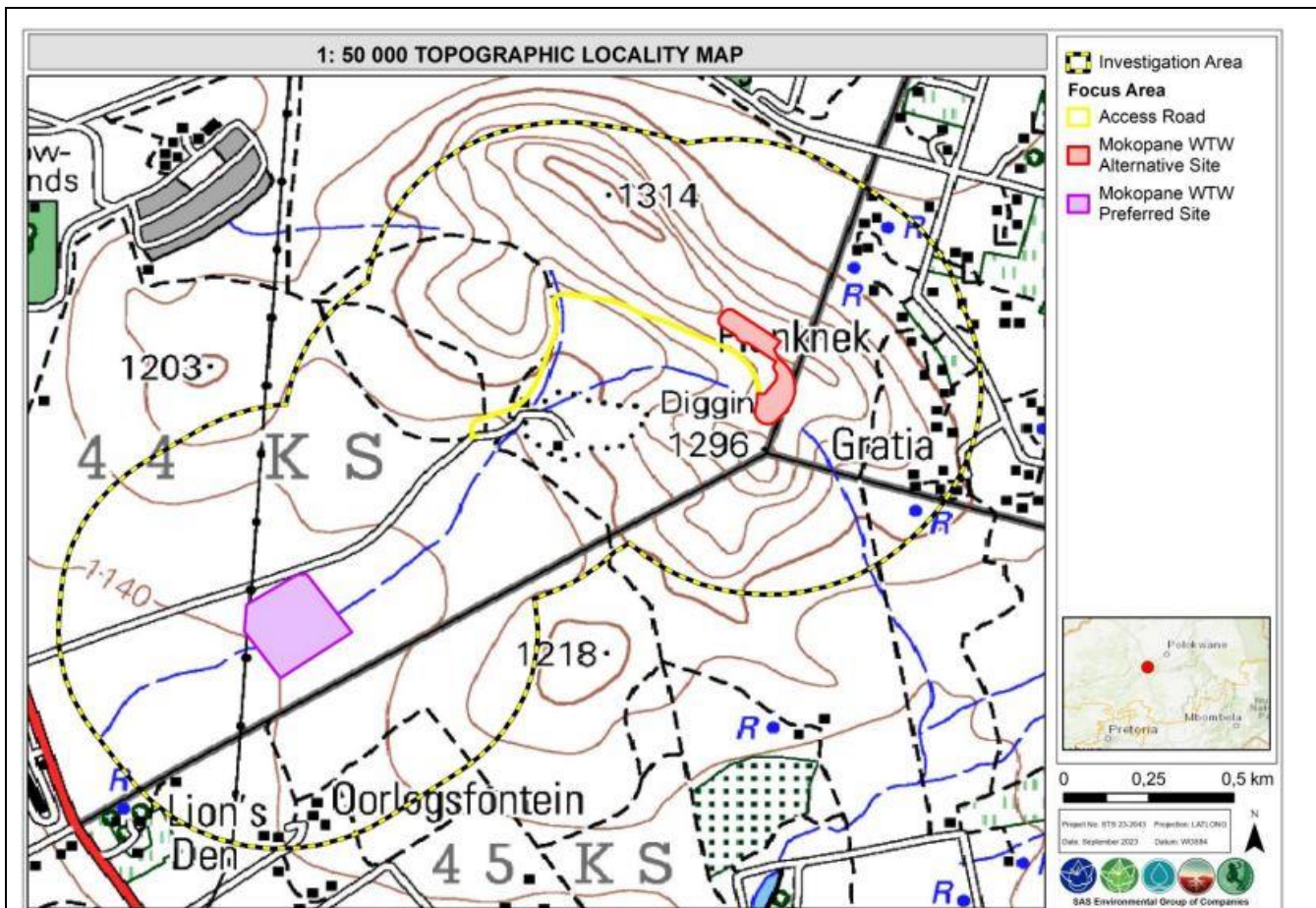
- Capturing of runoff of for re-use,
- Natural irrigation and links to landscaping, and,
- The use of natural plant filters.

Stormwater management must seek to recharge natural underground water systems and the discharge of runoff must take place as close to the point of interception as possible. In addition, single discharge points must be avoided in favour of multiple discharge systems to achieve more natural flow.

### **3.8. AQUATIC IMPACT ASSESSMENT (SCIENTIFIC AQUATIC SERVICES, 2023)**

#### **1. Introduction**

Scientific Aquatic Services (SAS) (Pty) Ltd was appointed to conduct a freshwater ecological assessment as part of the Environmental Authorisation (EA) process for a proposed water treatment works (WTW) and associated access road near Mokopane in the Limpopo Province. The area of assessment consists of the development site of the WTW (consisting of two alternative sites and a proposed access road to the alternative site) – the 'study area', along with a 500 m "zone of investigation" (the investigation area), in accordance with Government Notice (GN) 509 of 2016 as it relates to the National Water Act, 1998 (Act No. 36 of 1998) as amended (NWA).



**Figure 10.** The proposed Mokopane WTW, and associated investigation area depicted on a 1:50 000 topographical map in relation to the surrounding area.

A field-based assessment of the study and investigation areas was undertaken in late August 2023 to identify any freshwater occurrence and potential impacts of the proposed development on the freshwater environment. Two episodic drainage lines (EDLs) were identified to the south of the WTW site, draining southwards through part of the investigation area.

## 2. Application of the DFFE Web-based Environmental Screening Tool

The Department of Forestry Fisheries and the Environment's (DFFE) National Web-based Environmental Screening Tool (2020) designated the study and investigation areas as LOW aquatic biodiversity (freshwater) sensitivity. According to the environmental screening tool, the entirety of the study area and the investigation areas are located within an area of low aquatic / freshwater biodiversity significance (





**Figure 11.** Map of relative aquatic biodiversity according to the Web-based DFFE Screening Tool, indicating 'low' sensitivity for the study and investigation areas.

Two freshwater ecosystems were confirmed to occur in the investigation area and as crossed by the proposed northern alternative site access road. No freshwater ecosystems are located within the footprint of either of the WTW development alternatives sites, but one of the EDLs would be crossed by the northern alternative site access road. The two EDLs are highly impacted, primarily by the historical loss of the majority of their original extent due to the development of the Mokopane Landfill which was developed over their historical course and accordingly these drainage lines have been hydrologically isolated and are no longer connected to any larger downstream drainage network. Accordingly, these two episodic first order drainage lines are not considered to be sensitive and the proposed development would be highly unlikely to pose a high risk to the regional aquatic biodiversity or freshwater ecosystems in the area. Accordingly the sensitivity assigned to the study and investigation areas is not disputed and the assessment approach of undertaking an Aquatic Biodiversity Compliance Statement has been undertaken.

### 3. Results: Freshwater Ecosystem Assessment

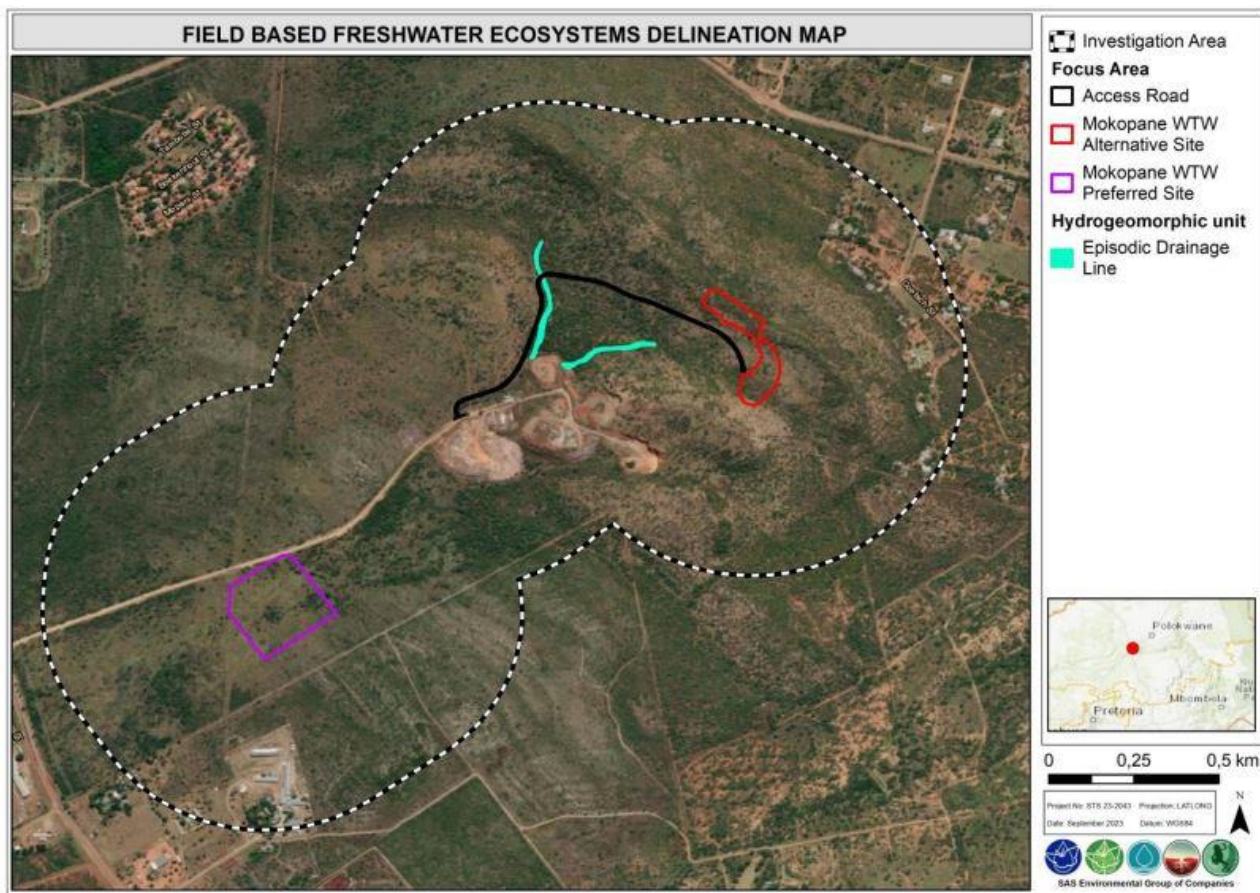
The desktop and site assessment confirmed the presence of two (2) freshwater ecosystems associated with the investigation area, with no freshwater ecosystems occurring on either of the alternative WTW development sites. Both freshwater ecosystems are episodic drainage lines (EDLs). The two EDL's are located to the southwest of the WTW (northern) site and drain southwards to the point at which they have been transformed by the infill associated with the Mokopane Landfill.

The freshwater ecosystems identified were classified according to the Classification System (Ollis et al., 2013) as Inland Systems. The freshwater ecosystems fall within the Bankenveld Ecoregion and the Central Bushveld Group 6 WetVeg (wetland vegetation) group, classified by Mbona et al. (2015) as “Critically Endangered”. At Levels 3 (Landscape Unit) and 4 (HGM Type) of the Classification System, the systems were classified as per the summary in Table 5, below.

**Table 5.** Characterisation at Levels 3 and 4 of the Classification System (Ollis et al., 2013) of the freshwater ecosystems associated with the Mokopane WTW study area and investigation areas.

Freshwater Ecosystem HGM Type	Level 3: Landscape unit	Level 4: Hydrogeomorphic (HGM) Type
River  (Episodic Drainage Line)	Valley floor—the base of a valley, situated between two distinct valley side-slopes, where alluvial or fluvial processes typically dominate.	linear landform with clearly discernible bed and banks, which permanently or periodically carries a concentrated flow of water. A river is taken to include

The delineated extent of the freshwater ecosystems relative to the proposed Mokopane WTW study area and associated investigation area are depicted in Figure 6 below.



**Figure 12.** Delineated freshwater ecosystems associated with the proposed Mokopane WTW study area and associated investigation area.

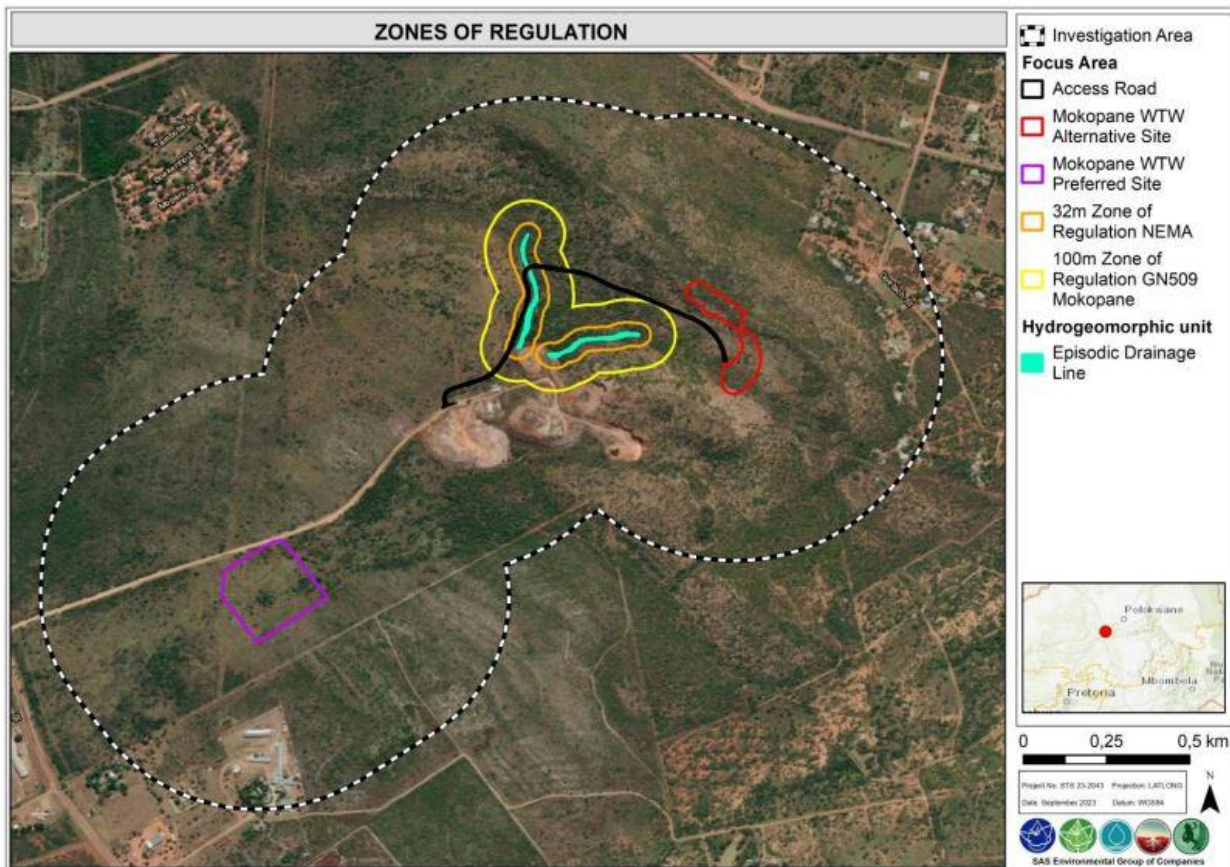
As detailed above, two (2) freshwater ecosystems were confirmed to occur within the investigation area of the proposed development. The two EDLs rise in a steep valley head located to the south of a ridge line on top of



which the Mokopane WTW development site is located. Accordingly both EDLs are southward draining and are located in steeply sloping terrain, located in the low points of the steep valley head. The EDLs are first order drainage features and are characterised by relatively small catchments. These factors along with the steeply-sloping terrain entail that the EDL's are very narrow channelled features. The natural vegetation in the part of the investigation area in which the EDLs are located consists of relatively dense woodland. The EDLs are thus vegetatively characterised by woody vegetation with a dense grassy vegetative substrate, being of a slightly different structure to the surrounding woodland and thus constituting a riparian zone. The EDLs are naturally episodic drainage features, experiencing surface flows only in response to rainfall events of sufficient duration and intensity to generate surface runoff which would naturally drain into the EDLs.

The two EDLs have been significantly altered / transformed by the Mokopane Landfill which has been developed in the area to the south. Significant volumes of infill material exist in the landfill footprint which have effectively destroyed a large portion of the historical / natural extent of the EDLs. The EDLs thus effectively terminate at the northern edge of the landfill, with any flows in the EDLs being likely to pond at this point. Due to the presence of the landfill, these EDLs have effectively been isolated from any downstream drainage network.

No part of either of the WTW alternative sites would be located in the NEMA EIA Regulations related 32m Zone of Regulation of any freshwater ecosystem located in the investigation area, and accordingly no NEMA EIA-ZoR would apply to either of the WTW alternative development sites. It is possible however that the proposed alternative site access road would exceed the threshold of 100m<sup>2</sup> associated with Activity 12 of Listing Notice 1, thereby triggering Activity 12 within 32m of the western EDL.



**Figure 13.** Potential Zones of Regulation related to NEMA and GN509 in the study and investigation areas..

#### 4. Risk Assessment

There are four key ecological impacts on the wetlands that are anticipated to occur namely:

- Loss of freshwater ecosystem habitat and ecological structure;
- Changes to the sociocultural and service provision;
- Impacts on the hydrology and sediment balance of the freshwater ecosystems; and
- Impacts on water quality.

Various activities and development aspects may lead to these impacts, however, provided that the mitigation hierarchy is followed, some impacts can be avoided or adequately minimised where avoidance is not feasible.

A summary of the DWS Risk Assessment Results is included in the Aquatic Biodiversity Compliance Statement Report (found in Appendix D).

Table 6 below summarises the construction phase impacts and recommended mitigation for the alternative site.

**Table 6. Construction phase impacts and recommended mitigation for the alternative site.**

Impact	Pre-mitigation:						Recommended mitigation	Post-mitigation:					
	Duration	Extent	Intensity	Consequence	Probability	Significance		Duration	Extent	Intensity	Consequence	Probability	Significance
Construction at the WTW - potential sedimentation of downgradient drainage lines due to site clearing and poor stormwater management	Short-term	Site specific	Low negative	Negligible	Unlikely	Very low - negative	<ul style="list-style-type: none"> <li>•Implementation of construction-phase stormwater controls - e.g. use of silt curtains, berms etc., as part of a multi-phase SWMP for the WTW;</li> <li>•Limiting of clearing of natural vegetation in non-developed parts of the development site footprint.</li> </ul>	Short-term	Site-specific	Negligible	Negligible	Unlikely	Very low - negative
Construction at the WTW - potential pollution of downgradient drainage lines due to poor management of hazardous materials such as paint, hydrocarbons	Short-term	Site specific	Low negative	Negligible	Unlikely	Very low - negative	<ul style="list-style-type: none"> <li>•Storage of hazardous materials in a bunded contained space;</li> <li>•Immediate remediation of hazardous material spills.</li> </ul>	Short-term	Site-specific	Negligible	Negligible	Unlikely	Very low - negative
Construction at the WTW - potential pollution of downgradient drainage lines due to poor cement mixing / batching	Short-term	Site specific	Low negative	Negligible	Unlikely	Very low - negative	<ul style="list-style-type: none"> <li>•Mixing of cement must only be undertaken within the construction camp and may not be mixed on bare soils;</li> <li>•Mixing of cement is also to be strictly undertaken within a lined, bound or bunded portable mixer. Ready mix concrete must preferably be used;</li> <li>•A batter board or other suitable platform/mixing tray is to be provided onto which any mixed concrete can be deposited whilst it awaits placing;</li> <li>•Cement bags must be disposed of in the demarcated hazardous waste receptacles;</li> <li>•Liquid cement spillage outside of the demarcated area must be promptly removed and taken to a suitably licenced waste disposal site.</li> </ul>	Short-term	Site-specific	Negligible	Negligible	Unlikely	Very low - negative
Access road construction - potential slumping of / dumping of construction waste and excavated material into the downgradient EDL	Short-term	Local	High negative	Moderately detrimental	Fairly Likely	Low - negative	<ul style="list-style-type: none"> <li>•A construction right of way must be established to which all construction activities (footprint) must be restricted; this construction right of way must be clearly demarcated;</li> <li>All stockpiling of excavated / construction material must be located on the upgradient side of the road construction right of way and not on the downgradient side;</li> <li>•Establish a formal construction waste control system that is properly controlled and enforced.</li> </ul>	Short-term	Local	Low negative	Slightly detrimental	Unlikely	Very low - negative



Impact	Pre-mitigation:					Recommended mitigation	Post-mitigation:						
	Duration	Extent	Intensity	Consequence	Probability		Significance	Duration	Extent	Intensity	Consequence	Probability	Significance
Access road construction - potential pollution of the downgradient drainage line by sediment and other pollutants such as paint / bitumen and cement	Short-term	Local	Moderate negative	Slightly detrimental	Fairly Likely	Low - negative	<ul style="list-style-type: none"> <li>Stormwater controls are very important in the context of the steeply sloping terrain. Stormwater controls such as berms and silt fences must be established and are particularly important in the part of the road alignment falling with the GN509 regulated area;</li> <li>Immediate remediation of hazardous material spills;</li> <li>Establish a formal construction waste control system that is properly controlled and enforced.</li> <li>An Environmental Control Officer (ECO) must be appointed in order to ensure all water related aspects are adequately mitigated for the construction phase of the proposed development.</li> <li>Refer to above rows for cement-related mitigation measures;</li> </ul>	Short-term	Local	Moderate negative	Slightly detrimental	Unlikely	Very low - negative
Access Road Construction - transformation of riparian habitat and potential alteration of habitat due to access road crossing structure construction	Long-term	Local	Moderate negative	Moderately detrimental	Certain	High negative	<ul style="list-style-type: none"> <li>The design of a crossing structure must ensure that the structure does not act as an impoundment and that sufficient culverts are installed to let flows bypass the structure and to allow biota to move under the structure;</li> <li>If the crossing is designed as a drift-type concrete structure the level of the drift must not be higher than the substrate in the channel bed to ensure that scour does not develop during flows and to allow biota to move across the drift;</li> <li>Slopes and embankments at the crossing structure must be adequately stabilised with geotextile (or other similar material) and revegetated to ensure the long term term stability and to prevent erosion;</li> <li>See row above for demarcation of a construction right of way and road-related stormwater control measures;</li> <li>See rows above for cement mixing / batching-related control measures.</li> </ul>	Long-term	Site Specific	Moderate negative	Moderately detrimental	Certain	Moderate - negative

Table 7 below summarises the operational phase impacts and recommended mitigation for the alternative site.  
**Table 7. Operational phase impacts and recommended mitigation for the alternative site.**

Impact	Pre-mitigation:					Recommended mitigation	Post-mitigation:						
	Duration	Extent	Intensity	Consequence	Probability		Significance	Duration	Extent	Intensity	Consequence	Probability	Significance
Operation - alteration of hydrology and geomorphology of adjacent drainage line due to poor operational stormwater management at WTW site	Long-term	Local	Negligible	Negligible	Unlikely	Very low - negative	<ul style="list-style-type: none"> <li>Stormwater infrastructure on the development site must be designed in line with the principles of SuDS in order to polish stormwater by trapping sediments and by removing pollutants that could pollute downgradient freshwater ecosystems, and in order to allow the gradual discharge of stormwater into the drainage lines following rainfall events.</li> <li>As such the use of 'soft' engineering features such as bioswales that are vegetated with suitable vegetation that are tolerant of both wet and dry conditions is strongly recommended.</li> <li>The use of stone pitching to reduce velocity of stormwater is strongly recommended;</li> <li>The proposed stormwater infrastructure must also be incorporated into a suitable and site-specific Stormwater Management Plan (SWMP).</li> </ul>	Long-term	Site-specific	Negligible	Negligible	Unlikely	Very low - negative
Operation - alteration of hydrology and water quality (pollution) impacts due to potential discharge of treatment residues into freshwater ecosystems	Long-term	Local	High negative	Highly detrimental	Fairly likely	Moderate-negative	<ul style="list-style-type: none"> <li>It is recommended that water treatment residue (waste byproduct from the treatment process) not be discharged into the adjacent (downgradient) EDL or other EDL in the investigation area, and that options for the disposal of the residue at a suitable landfill site, or its re-use for mining / agricultural activities.</li> </ul>	Long-term	Site-specific	Moderately negative	Moderately Detrimental	Unlikely	Low - negative
Operation - alteration of the hydrology of the EDL due to stormwater discharge from the access road	Long-term	Local	Moderate Negative	Moderately detrimental	Certain	High- negative	<ul style="list-style-type: none"> <li>Stormwater will be channelled from the road into the drainage line that is crossed. Design measures such as flow breakers to slow the velocity of stormwater must be included in the design of the road at the drainage line crossing point;</li> <li>Stormwater from the section of the road that runs closely in parallel to the western EDL must be designed to not cause erosion and scour in the adjacent riparian zone and channel of the drainage line.</li> </ul>	Long term	Local	Low-negative	Moderately Detrimental	Certain	Moderate-negative
Operation - potential pollution of the EDL due to spills and other road maintenance activities.	Long-term	Local	Moderate Negative	Moderately detrimental	Fairly likely	Low - negative	<ul style="list-style-type: none"> <li>Road maintenance activities must be confined to the developed footprint of the access road;</li> <li>All spills of potential pollutants on the road surface must be immediately remediated.</li> </ul>	Long term	Local	Low-negative	Moderately Detrimental	Unlikely	Low - negative

Table 8 below summarises the construction phase impacts and recommended mitigation for the preferred site.  
**Table 8. Construction phase impacts and recommended mitigation for the preferred site.**

Impact	Pre-mitigation:						Recommended mitigation	Post-mitigation:					
	Duration	Extent	Intensity	Consequence	Probability	Significance		Duration	Extent	Intensity	Consequence	Probability	Significance
Construction - potential sedimentation of freshwater ecosystems due to site clearing and poor stormwater management.	Short-term	Local	Negligible	Negligible	Unlikely	Very low - negative	Implementation of construction-phase stormwater controls - e.g. use of silt curtains, berms etc., as part of a multi-phase SWMP for the WTW; Limiting of clearing of natural vegetation in non-developed parts of the development site footprint.	Short-term	Site-specific	Low negative	Negligible	Unlikely	Very low - negative
Construction - potential contamination of freshwater ecosystems due to poor management of hazardous materials and potential pollutants such as paint, hydrocarbons and due to cement mixing.	Short-term	Local	Negligible	Negligible	Unlikely	Very low - negative	Storage of hazardous materials in a bunded contained space; Immediate remediation of hazardous material spills; •Mixing of cement must only be undertaken within the construction camp and may not be mixed on bare soils; •Mixing of cement is also to be strictly undertaken within a lined, bound or bunded portable mixer. Ready mix concrete must preferably be used; •A batter board or other suitable platform/mixing tray is to be provided onto which any mixed concrete can be deposited whilst it awaits placing; •Cement bags must be disposed of in the demarcated hazardous waste receptacles; •Liquid cement spillage outside of the demarcated area must be promptly removed and taken to a suitably licenced waste disposal site.	Short-term	Site-specific	Negligible	Negligible	Unlikely	Very low - negative

Table 9 below summarises the operational phase impacts and recommended mitigation for the preferred site.

Table 9. Operational phase impacts and recommended mitigation for the preferred site.

Impact	Pre-mitigation:						Recommended mitigation	Post-mitigation:					
	Duration	Extent	Intensity	Consequence	Probability	Significance		Duration	Extent	Intensity	Consequence	Probability	Significance
Alteration of hydrological and geomorphological processes of adjacent drainage line due to potentially poor operational stormwater management at the WTW.	Long-term	Local	Negligible	Negligible	Unlikely	Very low - negative	•Inclusion of formal stormwater controls in the operational design of the WTW facility; •Inclusion of SuDS principles in the operational stormwater design for the WTW facility.	Long-term	Site-specific	Negligible	Negligible	Unlikely	Very low - negative
•Potential discharge of treatment residue into a freshwater ecosystem (as one of the potential options for handling residue / waste from the water treatment process); that could permanently alter the hydrological characteristics and water quality of the receiving freshwater ecosystem.	Long-term	Local	High negative	Highly detrimental	Fairly likely	Moderate - negative	•It is recommended that that water treatment residue (waste byproduct from the treatment process) not be discharged into the downgradient EDLs or into any other freshwater ecosystem, and that options for the disposal of the residue at a suitable landfill site, or its re-use for mining / agricultural activities rather be implemented.	Long-term	Site-specific	Moderate-negative	Moderately Detrimental	Unlikely	Low - negative

## 5. Conclusion and Recommendations

The Mokopane WTW, as being applied for, would be unlikely to directly affect or impact any freshwater ecosystems should the recommendations made in the compliance statement report regarding the selection of a preferred site and the means of disposal of water treatment residues be adhered to. The risk profile to the freshwater environment associated with the proposed development is considered low to negligible, however in order to ensure that no indirect impacts on freshwater ecosystems materialise, it is critical that the mitigation measures and the recommendations for the preferred development site stipulated in this report are implemented for all development phases.

Due to the absence of any freshwater ecosystems on the preferred development site and due to the designation of low aquatic biodiversity sensitivity to the study and investigation areas, the development of the Mokopane WTW will not exert any significant impact on the freshwater environment, provided that the mitigation measures as stipulated in this report are implemented and adhered. It is the opinion of the freshwater specialist that the preferred

site be granted EA, subject to the implementation of all construction and operational mitigation measures as detailed in the compliance statement (found in Appendix D).

### 3.9. SOCIO-ECONOMIC IMPACTS (ZUTARI, 2023)

During September 2023, Zutari conducted a desktop Socio-economic Impact Assessment (SIA) for the proposed Mokopane WTW.

The comprehensive project description, baseline information, impacts assessment and associated mitigations are contained in the SIA Report, found in Appendix D.

#### 1. Introduction

The purpose of this SIA is to;

- Identify the social implications associated with the proposed Mokopane WTW;
- Assess, categorise, and rate the impacts based on the project phase which they are likely to occur viz., pre-construction and construction, operation and decommission;
- Recommend mitigation measures for identified negative impacts and enhancement measures for identified positive impacts; and
- Provide an assessment of cumulative impacts, including no-go alternative.

The tables below are the summary of the impacts ratings and recommended mitigation measures for all project phases.

#### 2. Findings, impacts rating and mitigation measures

Table 9 below, presents the impacts rating and mitigation measures associated with the alternative site.

**Table 9.** Pre-construction, construction, operational and decommission phase Impacts rating and mitigation measures for the alternative site.

Impact	Pre-mitigation:						Recommended mitigation	Post-mitigation:					
	Duration	Extent	Intensity	Consequence	Probability	Significance		Duration	Extent	Intensity	Consequence	Probability	Significance
<b>Pre-construction and Construction Phase</b>													
Income for farm owners (Land access)	Short-term	Local	Very high - positive	Moderately beneficial	Certain	High - positive	The developer should enter into a formal and fair land access agreement. Depending on the negotiations with the affected landowner/s, land access can either mean land purchase, lease agreement or servitude agreement. Land purchase appears to be a financially feasible option as it will entail a once-off payment to the affected landowner/s	Short-term	Local	Very high - positive	Moderately beneficial	Certain	High - positive
Procurement of goods and services	Short-term	Regional	Moderate - positive	Moderately beneficial	Certain	Moderate - positive	The developer should put in place a procurement policy aimed at supporting and prioritizing upcoming and qualifying	Short-term	Local	Very high - positive	Moderately beneficial	Certain	High - positive

							subcontractors or SMMEs, where possible. The policy should be aimed at providing first preference to appropriate subcontractors/SMMEs located in the surrounding communities, followed by those located in the municipal area and lastly those located elsewhere or outside the province.						
Employment opportunities	Short-term	Regional	Moderate - positive	Moderately beneficial	Certain	Moderate - positive	The developer should have an employment policy aimed at maximising employment opportunities in the local area and in the region	Short-term	Regional	High - positive	Moderately beneficial	Certain	High - positive
Community expectations	Short-term	Local	Very high - negative	Moderately detrimental	Certain	High - negative	Community expectations should be managed via timely and clear messaging throughout the Stakeholder engagement and consultation process	Short-term	Local	Low - negative	Slightly detrimental	Certain	Low - negative
Health and safety	Short-term	Site-specific		Moderately detrimental	Very likely	Moderate - negative	The developer should implement health and safety mitigation measures for communities and employees as per the recommendations made in other specialist studies viz., air quality, traffic, visual assessment etc	Short-term	Site-specific	Low - positive	Negligible	Fairly likely	Very low
Security	Short-term	Site-specific	High - negative	Slightly detrimental	Very likely	Low - negative	Security personnel should be stationed on site to monitor criminal activities in the construction site	Short-term	Site-specific	Low - negative	Negligible	Fairly likely	Very low
<b>Operation Phase</b>													
Employment opportunities	Long-term	Regional	Low - positive	Moderately beneficial	Certain	High - positive	The developer should have an employment policy aimed at maximising employment opportunities in the local area and in the region	Long-term	Regional	High - positive	Highly beneficial	Certain	Very high - positive
Access to potable water for selected communities in the Northern limb	Long-term	Local	Moderate - positive	Moderately beneficial	Certain	High - positive	A Water Management Master Plan should be in place, clearly specifying which communities in the Northern limb will benefit from accessing potable water	Long-term	Regional	High - positive	Highly beneficial	Certain	Very high - positive
community	Long-term	Local	Very high -	Highly detrimental	Very likely	High - negative	The Water Management	Long-term	Local	Moderate -	Moderately detrimental	Fairly likely	Low - negative



expectations			negative				Master Plan and associated beneficiaries should be communicated to the project interested and affected communities, to avoid creating expectations to from those communities which will not benefit from the project			negative			
Health and safety	Long-term	Site-specific	High - negative	Moderately detrimental	Certain	High - negative	The developer should implement health and safety mitigation measures for communities and employees as per the recommendations made in other specialist studies viz., air quality, traffic, visual assessment etc	Long-term	Site-specific	Moderate - negative	Moderately detrimental	Fairly likely	Low - negative
<b>Decommission Phase</b>													
Employment and business opportunities	Short-term	Regional	Moderate - positive	Moderately beneficial	Certain	Moderate - positive	The developer should have an employment policy aimed at maximising employment opportunities in the local area and in the region, including a procurement policy aimed at supporting and prioritizing upcoming and qualifying subcontractors or SMMEs, where possible	Short-term	Regional	High - positive	Moderately beneficial	Certain	High - positive
Health and safety	Short-term	Site-specific	Moderate - negative	Slightly detrimental	Very likely	Low - negative	The developer should implement health and safety mitigation measures for communities and employees as per the recommendations made in other specialist studies viz., air quality, traffic, visual assessment etc	Short-term	Site-specific	Low - negative	Negligible	Fairly likely	Very low
No access to potable water	Long-term	Local	Very high - negative	Highly detrimental	Certain	Very high - negative	Potable water beneficiaries should be notified on the decommissioning of the WTW prior to decommissioning. The municipality should provide alternative potable water source for the northern limb beneficiaries	Long-term	Local	Moderate - negative	Moderately detrimental	Very likely	Moderate - negative
Loss of employment and business	Long-term	Regional	Very high - negative	Extremely detrimental	Certain	Very high - negative	employees and businesses benefiting from operation of the	Long-term	Regional	Low - negative	Moderately detrimental	Fairly likely	Low - negative

opportunities								WTW should be notified in time regarding the decommissioning of the WTW prior to decommissioning					
---------------	--	--	--	--	--	--	--	--	--	--	--	--	--

Table 10 below, presents the impacts rating and mitigation measures associated with the preferred site.

**Table 10. Pre-construction, construction, operational and decommission phase Impacts rating and mitigation measures for the preferred site.**

Impact	Pre-mitigation						Recommended mitigation	Post-mitigation					
	Duration	Extent	Intensity	Consequence	Probability	Significance		Duration	Extent	Intensity	Consequence	Probability	Significance
<b>Pre-construction and Construction Phase</b>													
Income for farm owners (Land access)	Short-term	Local	Very high - positive	Moderately beneficial	Certain	High - positive	The developer should enter into a formal and fair land access agreement. Depending on the negotiations with the affected landowner/s, land access can either mean land purchase, lease agreement or servitude agreement. Land purchase appears to be a financially feasible option as it will entail a once-off payment to the affected land owner/s	Short-term	Local	Very high - positive	Moderately beneficial	Certain	High - positive
Procurement of goods and services	Short-term	Regional	Moderate - positive	Moderately beneficial	Certain	Moderate - positive	The developer should put in place a procurement policy aimed at supporting and prioritizing upcoming and qualifying subcontractors or SMMEs, where possible. The policy should be aimed at providing first preference to appropriate subcontractors/SMMEs located in the surrounding communities, followed by those located in the municipal area and lastly those located elsewhere or outside the province.	Short-term	Local	Very high - positive	Moderately beneficial	Certain	High - positive
Employment opportunities	Short-term	Regional	Moderate - positive	Moderately beneficial	Certain	Moderate - positive	The developer should have an employment policy aimed at maximising employment opportunities in the local area and in the region	Short-term	Regional	High - positive	Moderately beneficial	Certain	High - positive
Community expectations	Short-term	Local	Very high - negative	Moderately detrimental	Certain	High - negative	Community expectations should be managed via timely and clear messaging	Short-term	Local	Low - negative	Slightly detrimental	Certain	Low - negative

							throughout the Stakeholder engagement and consultation process						
Health and safety	Short-term	Site-specific		Moderately detrimental	Very likely	Moderate - negative	The developer should implement health and safety mitigation measures for communities and employees as per the recommendations made in other specialist studies viz., air quality, traffic, visual assessment etc	Short-term	Site-specific	Low - positive	Negligible	Fairly likely	Very low
Security	Short-term	Site-specific	High - negative	Slightly detrimental	Very likely	Low - negative	Security personnel should be stationed on site to monitor criminal activities in the construction site	Short-term	Site-specific	Low - negative	Negligible	Fairly likely	Very low
<b>Operation Phase</b>													
Employment opportunities	Long-term	Regional	Low - positive	Moderately beneficial	Certain	High - positive	The developer should have an employment policy aimed at maximising employment opportunities in the local area and in the region	Long-term	Regional	High - positive	Highly beneficial	Certain	Very high - positive
Access to potable water for selected communities in the Northern limb	Long-term	Local	Moderate - positive	Moderately beneficial	Certain	High - positive	A Water Management Master Plan should be in place, clearly specifying which communities in the Northern limb will benefit from accessing potable water	Long-term	Regional	High - positive	Highly beneficial	Certain	Very high - positive
community expectations	Long-term	Local	Very high - negative	Highly detrimental	Very likely	High - negative	The Water Management Master Plan and associated beneficiaries should be communicated to the project interested and affected communities, to avoid creating expectations to from those communities which will not benefit from the project	Long-term	Local	Moderate - negative	Moderately detrimental	Fairly likely	Low - negative
Health and safety	Long-term	Site-specific	High - negative	Moderately detrimental	Certain	High - negative	The developer should implement health and safety mitigation measures for communities and employees as per the recommendations made in other specialist studies viz., air quality, traffic, visual assessment etc	Long-term	Site-specific	Moderate - negative	Moderately detrimental	Fairly likely	Low - negative
<b>Decommission Phase</b>													
Employment and business opportunities	Short-term	Regional	Moderate - positive	Moderately beneficial	Certain	Moderate - positive	The developer should have an employment policy aimed at maximising employment	Short-term	Regional	High - positive	Moderately beneficial	Certain	High - positive

							opportunities in the local area and in the region, including a procurement policy aimed at supporting and prioritizing upcoming and qualifying subcontractors or SMMEs, were possible							
Health and safety	Short-term	Site-specific	Moderate - negative	Slightly detrimental	Very likely	Low - negative	The developer should implement health and safety mitigation measures for communities and employees as per the recommendations made in other specialist studies viz., air quality, traffic, visual assessment etc	Short-term	Site-specific	Low - negative	Negligible	Fairly likely	Very low	
No access to potable water	Long-term	Local	Very high - negative	Highly detrimental	Certain	Very high - negative	Potable water beneficiaries should be notified on the decommissioning of the WTW prior to decommissioning. The municipality should provide alternative potable water source for the northern limb beneficiaries	Long-term	Local	Moderate - negative	Moderately detrimental	Very likely	Moderate - negative	
Loss of employment and business opportunities	Long-term	Regional	Very high - negative	Extremely detrimental	Certain	Very high - negative	employees and businesses benefiting from operation of the WTW should be notified in time regarding the decommissioning of the WTW prior to decommissioning	Long-term	Regional	Low - negative	Moderately detrimental	Fairly likely	Low - negative	

### 3. Conclusion

The proposed WTWs are strategic infrastructure development projects which are aligned with the NIP and the overall goals of the NDP. The findings of the SIA indicate that the recommended mitigation measures are expected to reduce the significance of the identified negative impacts to acceptable levels, while positive impacts will on average be significantly enhanced to maximise benefits to surrounding communities in the Northern limb.

It is recommended that the developer should respectively consider the proposed mitigation and maximisation measures included in the SIA report to reduce the effect of negative impacts on communities and maximise the effect of positive impacts. Additionally, the specialist recommends that the proposed development should be authorised since the no-go alternative would hinder the execution of the national strategic plans aimed at providing potable water to communities for social use.

### **3.10. VISUAL IMPACTS (SCIENTIFIC AQUATIC SERVICES, 2023)**

A Visual compliance statement was prepared by Scientific Aquatic Services (SAS). The field assessment was undertaken during the spring season on the 5<sup>th</sup> of September 2023 for the focus area (i.e., the Mokopane WTW). The season within which the Visual Impact Assessment (VIA) takes place is irrelevant as the vegetation screening factor will remain similar. Seasonal colour variation will however be evident between winter and summer.

The proposed Mokopane WTW is analogous to a low sensitivity from a visual and aesthetic viewpoint, as likely presented by the DFFE Screening Tool.

#### **1. Impact Statement**

Since the alternative site is situated adjacent to the Planknek AH settlement and the preferred site adjacent to light industrial / warehousing and both WTW in the vicinity of the Mogalakwena landfill site, the landscape has been degraded by anthropogenic changes and the receptors located within the receiving environment have grown accustomed to an altered landscape.

As discussed in the visual compliance statement, the alternative site will have a higher visual impact than the preferred site, due to the alternative site situated at a higher elevation and located adjacent to the Planknek AH where people reside, whereas the preferred site is situated in the vicinity of the light industrial or warehousing area where people are working and thus focusing less on the surrounding environment. Therefore, from a visual perspective the preferred site is the preferred option.

When considering the development phases of the proposed project, the construction phase will have the highest visual intrusion due to the removal of vegetation and levelling of the ground in preparation for the proposed WTW, with increased vehicular movement in the area, temporarily altering the sense of place of the area as well. The points below briefly describe the visual impacts the proposed project will have during the construction and operational phases:

- The sense of place of the area will shift from calmness and tranquillity to busy due to vehicular movement in the area during the preparation of the area and removal of vegetation for the proposed WTW;
- Visual contrast to the surrounding environment may occur during earthworks and construction activities and the yellow construction vehicles may be clearly noticeable from the green and brown background formed by the vegetation, and hill with outcrops as well as the landfill site;
- Direct visual exposure of the construction activities will occur for road users traveling on the N1 national road and R518 road, within a limited distance and of a limited duration, as well as indirectly through fugitive dust generated by the earthworks on a windy day; and
- The sources of lighting associated with the proposed WTW will contribute somewhat to the effects of night time lighting and skyglow.

The mitigation measures outlined below would serve to minimise the potential visual impacts during the construction and operational phases of the proposed project:

- The development footprint and disturbed areas surrounding the proposed WTW should be kept as small as possible and the areas cleared of natural vegetation and topsoil must be kept to a minimum. By ensuring that the surrounding bushveld vegetation is retained, the proposed WTW will be screened either partly or fully from the receiving environment, at certain vantage points;



- With the proposed WTW situated within the Fossil Hominid Sites of SA, it must be ensured that the heights of the proposed infrastructure be kept as low as possible without increasing the footprint considerably;
- All construction areas must be kept in a neat and orderly condition at all times and fenced off;
- Making use of motion detectors on security lighting, where possible, ensures that the site will remain in relative darkness, until lighting is required for security purposes; and
- Should the Alternative WTW site be selected for the proposed development, it must be ensured that the roadside vegetation along the R518 road, with particular mention of the trees and shrubs, be retained in order to partly obscure the view toward the proposed development.

## **2. Conclusion**

It is important to note that visual impacts are only experienced when there are receptors present to experience the impact. The outcome of the desktop and field assessments indicated that the only sensitive receptors within the visual assessment zone comprise the Planknek AH settlement, the N1 national road and R518 road and isolated farmsteads.

Based on the field and desktop assessments the alternative site is situated at a higher elevation and located adjacent to the Planknek AH where people reside, whereas the preferred site is situated in the vicinity of the light industrial / warehousing area where people are working and thus focusing less on the surrounding environment. Therefore, the alternative site will have a higher visual impact than the preferred site, concluding from a visual perspective the preferred site is the preferred option.

Based on the findings of the visual assessment, the proposed WTW is expected to have a minimal visual impact on the receiving environment. It is therefore the opinion of the specialist that the project be considered favourably from a visual resource management perspective.

### **3.11. TERRESTRIAL BIODIVERSITY (SCIENTIFIC AQUATIC SERVICES, 2023)**

Scientific Terrestrial Services (Pty) Ltd (STS) was appointed by Zutari to prepare a terrestrial compliance statement (where relevant) for the proposed Mokopane WTW and associated infrastructure. The terrestrial compliance statement report is included in Appendix D.

A field investigation to ground truth the desktop findings was undertaken on the 29th of August 2023. The focus area was considered utilising digital satellite imagery prior to and after the field investigation. Prior to the site visit, all species that were triggered by the screening tool (where applicable) for the plant and animal themes, were used to guide fieldwork preparation.

#### **1. Desktop research**

The focus area is in the Central Bushveld Bioregion, which is situated within the Savanna Biome. The associated vegetation type is the Polokwane Plateau Bushveld (as per the 2018 Vegetation Map Project (VegMAP)). The 2022 Red List of Ecosystems (RLE) database replaces the 2018 National Biodiversity Assessment (NBA) database and, according to the 2022 RLE, the focus area is located within a Least Concern (LC) ecosystem.

According to the South African Protected Areas Database (SAPAD) (2023, Q1), the focus area is located directly within a protected area, namely the Fossil Hominid Sites of South Africa (SA), also considered a United Nations Educational, Scientific, and Cultural Organisation (UNESCO).

The entire focus area is located within a Category 1 Critical Biodiversity Area (CBA), i.e., these are Irreplaceable Sites required to meet biodiversity pattern and / or ecological processes targets.

## 2. Flora and Faunal Ecology

Three broad habitats were delineated during the site assessment, namely the (1) Mountain Bushveld and associated Episodic Drainage Line (EDL), (2) the Plateau Bushveld, and (3) Transformed Habitat.

A total of 94 plant taxa were recorded across the focus area, 61% of which were represented by woody species, 12% by forbs (under-represented due to season of assessment), 7% by succulents, and 20% by graminoid species.

While conducting the site assessment, it became clear that the focus area is still effectively utilised by various faunal species, including two confirmed and 14 potential species of conservation concern (SCC). Smaller species like reptiles, small mammals, and invertebrates have limited ranges in which they move and are probably permanent residents of the focus area and habitats within. On the other hand, larger mammals, and avifauna, which are more mobile, are likely to use the focus area in combination with the surrounding natural vegetation. These species are expected to have home and foraging ranges that extend beyond the focus area and are not entirely dependent on it for their survival.

## 3. Site Ecological Importance (SEI)

Based on the criteria provided in the compliance statement report, all habitats within the focus area were allocated an importance category, i.e., a SEI category. SEI is a function of the biodiversity importance (BI) of the receptor (e.g., species of conservation concern, the vegetation/fauna community or habitat type present on the site) and its resilience to impacts (receptor resilience [RR]). BI in turn is a function of conservation importance (CI) and the functional integrity (FI) of the receptor.

The below table breaks down the SEI obtained for the floral and faunal components.

**Table 11. Floral and Faunal SEI for the focus area habitats.**

HABITAT UNIT	FLORAL SEI	FAUNAL SEI
Mountain Bushveld and associated EDL	High Avoidance mitigation wherever possible. Minimisation mitigation – changes to project infrastructure design to limit the amount of habitat impacted, limited development activities of low impact acceptable. Offset mitigation may be required for high impact activities.	High Avoidance mitigation wherever possible. Minimisation mitigation – changes to project infrastructure design to limit the amount of habitat impacted, limited development activities of low impact acceptable. Offset mitigation may be required for high impact activities.
Plateau Bushveld	Medium Minimisation and restoration mitigation – development activities of medium impact acceptable followed by appropriate restoration activities.	Low Minimisation and restoration mitigation – development activities of medium to high impact acceptable followed by appropriate restoration activities.
Transformed Habitat	Very low Minimisation mitigation – development activities of medium to high impact acceptable and restoration activities may not be required	Very low Minimisation mitigation – development activities of medium to high impact acceptable and restoration activities may not be required

The below table breaks down the SEI obtained for the floral and faunal components.

#### 4. Impact Assessment

A full impact assessment methodology, activities and aspects register, and impact discussion is included in the terrestrial biodiversity compliance statement report (attached in Appendix D).

Below are tables showing the impacts summary.

#### 4.1 Impacts on floral habitat, diversity, and SCC

**Table 12. Pre-construction Phase impacts on floral habitat, diversity, and SCC from the proposed development activities. Required mitigation measures are presented at the bottom of each table section.**

Impact	Pre-mitigation:					Significance	Recommended mitigation	Post-mitigation:					
	Duration	Extent	Intensity	Consequence	Probability			Duration	Extent	Intensity	Consequence	Probability	Significance
<b>IMPACTS ON FLORAL HABITAT AND DIVERSITY</b>													
Potential loss of floral habitat and diversity due to 1) general site preparation and project planning, and 2) potential poor infrastructure design and planning for all proposed activities (Mokopane WTW and associated access road)	Medium-term	Local	Moderate - negative	Moderately detrimental	Certain	Moderate - negative	** Ensure that sound environmental management is in place during the planning phase.  ** Minimise loss of indigenous vegetation where possible through adequate planning and, where necessary, by incorporating the sensitivity of the biodiversity report as well as other specialist studies (e.g., freshwater assessment (SAS 23-1135, 2023)).  ** Prior to the commencement of construction activities on site, an AIP control plan should be drafted, and the AIP control should subsequently be implemented throughout all phases of the proposed project. The AIP control and management plan should be regularly updated by a suitably trained specialist. It is highly recommended that the AIP Management/ Control Plan should be monitored on a yearly basis (or as specified by an AIP professional).	Medium-term	Site-specific	Moderate - negative	Slightly detrimental	Unlikely	Very low
Potential loss of floral habitat and diversity due to 1) general site preparation and project planning, and 2) potential poor infrastructure design and planning for all proposed activities (Alternative WTW)	Medium-term	Local	Moderate - negative	Moderately detrimental	Certain	Moderate - negative	** Prior to the commencement of construction activities, the entire construction servitude, including lay down areas, should be clearly demarcated.  ** Prior to the commencement of construction activities on site, a rehabilitation plan and/or strategy should be developed for implementation throughout the project phases.	Medium-term	Site-specific	Low - negative	Slightly detrimental	Unlikely	Very low
<b>IMPACTS ON FLORAL SCC</b>													
Reduced number of floral SCC within the Mountain Bushveld and associated EDL (Removal, destruction, and/or relocation of affected SCC prior to proposed activities)	Medium-term	Regional	High - negative	Highly detrimental	Very Likely	High - negative	** Before any construction activities can occur, a detailed walkdown of the footprint area must take place, during which all SCC should be marked, and permits applied for to remove / cut / destroy these species.  ** Before any proposed construction activities may take place, permits from the relevant authorities should be obtained before removal, cutting or destruction of protected species occurs, i.e., Limpopo Economic Development, Environmental and Tourism (LEDET) for provincially protected species and/or DFFE for nationally protected species (e.g., NFA-protected trees), or threatened species.	Medium-term	Local	Moderate - negative	Slightly detrimental	Very Likely	Moderate - negative

Impact	Pre-mitigation:					Significance	Recommended mitigation	Post-mitigation:					
	Duration	Extent	Intensity	Consequence	Probability			Duration	Extent	Intensity	Consequence	Probability	Significance
Reduced number of floral SCC within the Plateau Bushveld (Removal, destruction, and/or relocation of affected SCC prior to proposed activities)	Medium-term	Local	Moderate - negative	Moderately detrimental	Very Likely	Moderate - negative	** A rescue and relocation plan should be developed (based on the outcome of the floral walkdown) for RDLs, NFA-protected trees, and LEMA-protected species where relevant. The plan must be approved by the relevant authorities (along with the necessary permits where applicable).  ** If SCC, which are not RDL species, are encountered and will be affected by the construction activities, these species must, as far as is possible, be relocated to suitable habitat surrounding the disturbance footprint. If RDL species are encountered, avoidance is the best mitigation (as stipulated by the SANBI).	Medium-term	Site-specific	Low - negative	Slightly detrimental	Very Likely	Low - negative
Reduced number of floral SCC within the Transformed Habitat (Removal, destruction, and/or relocation of affected SCC prior to proposed activities)	Short-term	Site-specific	Low - negative	Negligible	Unlikely	Very low	** If RDL plant species will be lost due to clearing of vegetation, such species must be replaced (considering liaison with authorities) either during rehabilitation initiatives or through translocation to suitable habitat surrounding the disturbance footprint. Avoidance of impacts to RDL species, however, must always be prioritised. The relocation site will need to be fenced-off (or somehow barricaded) and monitoring of relocated / transplanted species will be essential until it is evident that the species have successfully established (a species-specific management plan will be required).	Short-term	Site-specific	Negligible	Negligible	Unlikely	Very low

**Table 13. Construction Phase impacts on floral habitat, diversity, and SCC from the proposed development activities. Required mitigation measures are presented at the bottom of each table section.**



Impact	Pre-mitigation:					Recommended mitigation	Post-mitigation:						
	Duration	Extent	Intensity	Consequence	Probability		Significance	Duration	Extent	Intensity	Consequence	Probability	Significance
<b>IMPACTS ON FLORAL HABITAT AND DIVERSITY</b>													
Loss of floral habitat and diversity associated with the <b>Mountain Bushveld and associated EDL</b> (clearance of vegetation)	Long-term	Local	High - negative	Highly detrimental	Certain	High - negative	** Design of infrastructure should be environmentally sound, and all possible precautions taken to prevent potential spills and /or leaks. All spills and /or leaks from equipment during construction activities must be immediately remedied and cleaned up to ensure that these chemicals do not enter the soils.  ** The construction footprint must be kept as small as possible to minimise the impact on the surrounding environment (edge effect management). Removal of vegetation must be restricted to what is necessary and should remain within the approved development footprint.	Long-term	Local	High - negative	Highly detrimental	Certain	High - negative
Loss of floral habitat and diversity associated with the <b>Plateau Bushveld</b> (clearance of vegetation)	Long-term	Site-specific	Moderate - negative	Moderately detrimental	Certain	Moderate - negative	** Mitigation measures as proposed by the Freshwater specialist (SAS 23-1135, 2023) regarding construction related to the EDL must be implemented. Contractor laydown areas, vehicle re-fueling areas and material storage facilities to remain outside of the delineated freshwater ecosystems and applicable setback area.  ** Edge effects of all construction activities, which may affect floral habitat within surrounding areas, must be strictly managed, e.g., implement an AIP control plan from the get-go, mitigate soil erosion by reducing soil compaction caused by movement of construction personnel and vehicles. Stormwater controls such as berms and silt fences must be established and are particularly important in the part of the road alignment falling within the GN509 regulated area (SAS 23-1135, 2023).	Long-term	Site-specific	Moderate - negative	Moderately detrimental	Certain	Moderate - negative
Loss of floral habitat and diversity associated with the <b>Transformed Habitat</b> (clearance of vegetation)	Short-term	Site-specific	Low - negative	Negligible	Unlikely	Very low	** Open fires must be restricted to fire safe zone facilities and suitable fire control measures must be in place. However, use of trees, shrubs or any vegetation for fire-making purposes must be strictly prohibited. A Fire Management Plan (FMP) must be in place to ensure that any fires that do originate can be managed and / or stopped before significant damage to the environment occurs.	Short-term	Site-specific	Negligible	Negligible	Unlikely	Very low
<b>IMPACTS ON FLORAL SCC</b>													
Degradation of floral habitat beyond the footprint due to uncontrolled or poorly managed edge effects ( <b>focus area</b> )	Long-term	Local	Moderate - negative	Moderately detrimental	Very likely	Moderate - negative	** No indiscriminate driving through the veld may be allowed. Vehicles should be restricted to travelling only on designated roadways to limit the ecological footprint of the construction activities.  ** No collection of indigenous floral species must be allowed by construction personnel.  ** A rehabilitation plan should be implemented upon completion of the construction activities to ensure that the affected areas outside of the project footprints return to an ecologically functioning state, thereby increasing habitat connectivity within affected areas. Rehabilitation of natural vegetation should proceed in accordance with the rehabilitation plan (see also Table 18).  ** Avoidance of impacts to the CBA 1 associated with the Mokopane WTW and associated access road must be prioritised, and the Alternative WTW instead considered as the preferred option. Options to mitigate the loss of habitat associated with a CBA 1 is limited; however, where avoidance is not possible, the focus of mitigation measures should be on managing edge effects to reduce cumulative loss of CBAs through: 1) minimisation of habitat loss through reconsideration of layouts (Alternative WTW preferred), 2) prevention of habitat fragmentation through keeping new construction activities within or close to existing disturbances, and 3) ensuring a rehabilitation plan/strategy is developed and approved by authorities prior to activities commencing that will promote connectivity and ongoing ecological processes within the landscape.	Medium-term	Site-specific	Moderate - negative	Slightly detrimental	Unlikely	Very low
Reduced number of floral SCC within the surrounding <b>Mountain Bushveld and associated EDL</b> (monitoring of rescue and relocation initiatives, and harvesting of flora)	Medium-term	Site-specific	Moderate - negative	Slightly detrimental	Very likely	Low - negative	** No collection of indigenous floral species must be allowed by construction personnel, especially with regards to floral SCC.  ** Monitoring of relocated and/or rescued species should occur on a regular basis (e.g., twice yearly). Good record keeping should be implemented. If species have not successfully established post rescue and relocation, then conditions should be assessed, and measures developed to ensure survival of other such species. New	Short-term	Site-specific	Moderate - negative	Slightly detrimental	Fairly likely	Low - negative

Impact	Pre-mitigation:					Recommended mitigation	Post-mitigation:						
	Duration	Extent	Intensity	Consequence	Probability		Significance	Duration	Extent	Intensity	Consequence	Probability	Significance
Reduced number of floral SCC within the surrounding <b>Plateau Bushveld</b> (monitoring of rescue and relocation initiatives, and harvesting of flora)	Medium-term	Site-specific	Moderate - negative	Slightly detrimental	Very likely	Low - negative	species should be planted in the case of unsuccessful establishment of rescued/relocated species.  ** Edge effect control needs to be implemented by fencing off or demarcating no-go areas to prevent further degradation and potential loss of floral SCC and their habitat outside of the proposed development footprint area.	Short-term	Site-specific	Moderate - negative	Slightly detrimental	Fairly likely	Low - negative
Reduced number of floral SCC within the surrounding <b>Transformed Habitat</b> (monitoring of rescue and relocation initiatives, and harvesting of flora)	Short-term	Site-specific	Negligible	Negligible	Very unlikely	Very low		Short-term	Site-specific	Negligible	Negligible	Very unlikely	Very low

**Table 14.** Operational and Maintenance Phase impacts on floral habitat, diversity, and SCC from the proposed development activities. Required mitigation measures are presented at the bottom of each table section.

Impact	Pre-mitigation:					Recommended mitigation	Post-mitigation:						
	Duration	Extent	Intensity	Consequence	Probability		Significance	Duration	Extent	Intensity	Consequence	Probability	Significance
Reduced habitat integrity of the habitat surrounding the footprint areas due to poor implementation of maintenance activities and edge effects (applicable to all habitat types)	Long-term	Local	Moderate - negative	Moderately detrimental	Very likely	Moderate-negative	** Manage all edge effects or indirect disturbances stemming from operational and maintenance activities: 1) implement erosion control measures where necessary to ensure that further habitat loss does not occur, 2) no uncontrolled or unsanctioned fires must be allowed (FMP should be in place), 3) maintenance vehicles must be restricted to travelling only on designated roadways to limit the ecological footprint of the proposed activities, and 4) implement an AIP Management / Control Plan that includes ongoing monitoring and control of the presence and/or re-emergence of such species.  ** Management of AIPs during the operational-phase activities must be focused on limiting their introduction and preventing their spread. For example, roadsides should be monitored, as they serve as common corridors along which AIP species are introduced and dispersed and disturbed areas should regularly be monitored for AIP recruitment until successfully rehabilitated.  ** Any natural areas beyond the direct footprint, which have been affected by construction activities must be rehabilitated using indigenous species. As part of rehabilitation activities following the construction of the WTW, ensure that a vegetation layer is reinstated and maintained where natural areas beyond the direct footprint have been affected by construction activities – i.e., to promote soil health and vegetation establishment, to reduce habitat fragmentation, and to provide resources for fauna. In this regard, the use of indigenous plants from the reference vegetation type is recommended for best biodiversity outcomes (e.g., planting trees such as <i>Combretum apiculatum</i> , <i>Dombeya rotundifolia</i> , <i>Sclerocarya birrea</i> subsp. <i>Caffra</i> (NFA-protected species), <i>Phyllogelton zeyheri</i> (NFA-protected species), <i>Searsia leptodictya</i> , <i>Ziziphus mucronata</i> , and <i>Vitex rehmannii</i> ).	Medium-term	Local	Moderate - negative	Moderately detrimental	Unlikely	Low - negative

## 4.2. Impacts on faunal habitat, diversity, and SCC

**Table 15.** Pre-construction Phase impacts on faunal habitat, diversity, and SCC from the proposed development activities. Required mitigation measures are presented within each table section.



Impact	Pre-mitigation:					Significance	Recommended mitigation	Post-mitigation:					
	Duration	Extent	Intensity	Consequence	Probability			Duration	Extent	Intensity	Consequence	Probability	Significance
<b>PROPOSED MOKOPANE WTW AND ACCESS ROAD</b>													
Loss of faunal habitat and diversity.	Long-term	Site-specific	High - negative	Moderately detrimental	Certain	High - negative	<ul style="list-style-type: none"> <li>At all times, ensure that sound environmental management and practices will be implemented during the pre-construction phase; and carried forward to the construction and operational phases;</li> <li>In the event that any faunal SCC listed in Section 4 or Appendix I are encountered in the focus area and require relocation, the relevant provincial and national permits should be obtained from the Department of Forestry, Fisheries and the Environment (DFFE);</li> <li>Human and vehicle movement in areas where no development is planned should be restricted to prevent further disturbance to the receiving environment;</li> <li>As far as possible use existing roads. New roads are to be designed in such a way as to minimise habitat fragmentation and habitat loss using suitable culvert designs; and</li> <li>It is recommended that the alternative WTW site would be considered as lower impacts can be expected.</li> </ul>	Long-term	Site-specific	Moderate - negative	Moderately detrimental	Certain	Moderate - negative
Loss of faunal SCC	Long-term	Local	High - negative	Highly detrimental	Very likely	High - negative		Long-term	Local	High - negative	Highly detrimental	Very likely	High - negative
Degradation of faunal habitat beyond the footprint due to uncontrolled edge effects	Long-term	Local	Moderate - negative	Moderately detrimental	Fairly likely	Low - negative		Long-term	Local	Low - negative	Moderately detrimental	Unlikely	Low - negative
<b>PROPOSED ALTERNATIVE WTW</b>													
Loss of faunal habitat and diversity.	Long-term	Site-specific	Moderate - negative	Moderately detrimental	Certain	Moderate - negative	<ul style="list-style-type: none"> <li>At all times, ensure that sound environmental management and practices will be implemented during the pre-construction phase; and carried forward to the construction and operational phases;</li> <li>In the event that any faunal SCC listed in Section 4 or Appendix I are encountered in the focus area and require relocation, the relevant provincial and national</li> </ul>	Long-term	Site-specific	Low - negative	Slightly detrimental	Certain	Moderate - negative
<p>permits should be obtained from the Department of Forestry, Fisheries and the Environment (DFFE);</p> <ul style="list-style-type: none"> <li>Human and vehicle movement in areas where no development is planned should be restricted to prevent further disturbance to the receiving environment; and</li> <li>As far as possible use existing roads. New roads are to be designed in such a way as to minimise habitat fragmentation and habitat loss using suitable culvert designs.</li> </ul>													
Loss of faunal SCC	Long-term	Site-specific	Moderate - negative	Moderately detrimental	Very likely	Moderate - negative	Long-term	Site-specific	Low - negative	Slightly detrimental	Very likely	Low - negative	
Degradation of faunal habitat beyond the footprint due to uncontrolled edge effects	Long-term	Site-specific	Moderate - negative	Moderately detrimental	Fairly likely	Low - negative	Long-term	Site-specific	Low - negative	Slightly detrimental	Unlikely	Very low	

**Table 16. Construction Phase impacts on faunal habitat, diversity, and SCC from the proposed development activities. Required mitigation measures are presented within each table section.**

Pre-mitigation:							Post-mitigation:							
Impact	Duration	Extent	Intensity	Consequence	Probability	Significance	Recommended mitigation	Duration	Extent	Intensity	Consequence	Probability	Significance	
<b>PROPOSED MOKOPANE WTW AND ACCESS ROAD</b>														
Loss of faunal habitat and diversity associated with the Mountain Bushveld	Long-term	Site-specific	High - negative	Moderately detrimental	Certain	High - negative	<ul style="list-style-type: none"> <li>Where possible, consideration to further footprint reduction should be given;</li> <li>Where roads will cross the freshwater habitat, appropriate culverts and road designs must be implemented to ensure that the hydrological flow is not impacted upon and that freshwater faunal species are still able to traverse along this habitat unit;</li> <li>The boundaries of the development footprint must be clearly demarcated and no development activities or movement of personnel or vehicles are to go beyond these boundaries;</li> <li>Vegetation clearance must be restricted to the proposed footprints only;</li> <li>Construction within sensitive habitats should be strictly monitored and should be limited to that which is absolutely necessary and authorised;</li> <li>Vegetation clearance must be planned in such a way that not all areas are cleared at once, whilst clearance activities should be undertaken in a phased manner as to limit habitat fragmentation and allow for faunal species to naturally relocate out of an area;</li> <li>Construction vehicles are to utilise existing roads as far as possible, no off-roading is to be allowed to prevent unnecessary soil compaction, habitat disturbance and potential species mortalities from vehicle collisions;</li> <li>As far as possible vegetation clearance activities should be undertaken in the winter months, as faunal species will not be breeding and there is a lower risk to nesting avifauna. As part of the clearing activities, it is acknowledged that during the winter months, reptiles and some invertebrates will be slower moving and/or, in a state of torpor. As such, it is recommended that as vegetation clearance/earth works takes place, a team of trained individuals (may also include construction staff that have been suitably upskilled and trained), moves ahead of these activities and searches for and relocates any species unable to move out of the way themselves. Species are to be moved to the open space areas, ideally of the same or similar habitat type;</li> <li>No hunting or trapping of fauna (Common and SCC) by construction personnel within the footprints or surrounding natural areas is to be allowed;</li> <li>Stormwater runoff must be managed in adherence to the stormwater management plan;</li> </ul>	Long-term	Site-specific	Moderate - negative	Moderately detrimental	Certain	Moderate - negative	
Loss of faunal habitat and diversity associated with the EDL	Long-term	Site-specific	Moderate - negative	Moderately detrimental	Very likely	Moderate - negative		Long-term	Site-specific	Low - negative	Unlikely	Moderately detrimental	Very likely	Low - negative
Loss of faunal habitat and diversity associated with the Transformed Habitat	Long-term	Site-specific	Low - negative	Slightly detrimental	Very likely	Low - negative		Long-term	Site-specific	Low - negative	Unlikely	Moderately detrimental	Unlikely	Very low
Loss of faunal SCC associated with the Mountain Bushveld	Long-term	Local	High - negative	Highly detrimental	Very likely	High - negative		Long-term	Local	Moderate - negative	Moderately detrimental	Very likely	Very likely	Moderate - negative
Loss of faunal SCC associated with the EDL	Long-term	Site-specific	Moderate - negative	Moderately detrimental	Fairly likely	Low - negative		Long-term	Site-specific	Moderate - negative	Moderately detrimental	Unlikely	Unlikely	Low - negative
Loss of faunal SCC associated with the Transformed Habitat	Long-term	Site-specific	Moderate - negative	Moderately detrimental	Fairly likely	Low - negative		Long-term	Site-specific	Moderate - negative	Moderately detrimental	Unlikely	Unlikely	Low - negative

Pre-mitigation:							Post-mitigation:							
Impact	Duration	Extent	Intensity	Consequence	Probability	Significance	Recommended mitigation	Duration	Extent	Intensity	Consequence	Probability	Significance	
Degradation of faunal habitat beyond the footprint due to uncontrolled edge effects	Long-term	Local	Moderate - negative	Moderately detrimental	Fairly likely	Low - negative	<ul style="list-style-type: none"> <li>All construction related waste and material is to be disposed of at a registered waste facility and no waste or construction rubble is to be dumped in the surrounding natural habitats;</li> <li>Erosion inspections should be undertaken frequently, but especially following heavy rains. Where erosion activities are identified, they are to be rectified timeously to avoid further erosive action and habitat loss;</li> <li>If any spills occur, they should be immediately cleaned up to avoid soil contamination. In the event of a breakdown, maintenance of vehicles must take place with care, and the collection of spillages should be practised preventing the ingress of hydrocarbons into the topsoil;</li> <li>No on-site informal fires are allowed;</li> <li>Regular dust suppression must be undertaken on bare soils;</li> <li>External lighting should be kept to a minimum with downward facing lights being used. Yellow or red fluorescent lights are preferable, while the use of bright white or LED lights should be avoided;</li> <li>Noise must be kept to acceptable levels as per the environmental norms and standards for noise mitigation as stipulated within the noise specialist report;</li> <li>Construction personnel are to be educated about the various faunal species in the area, particularly about venomous spiders, snakes and scorpions. None of these or other species are to be killed or injured by construction personnel. Should any of these species be encountered, these species are to be safely and carefully relocated to the surrounding natural habitat adjacent the development site, should they not move off on their own;</li> <li>The contact details of a suitably qualified snake handler be made available to construction teams should a venomous snake be encountered that needs removal. Alternatively, it is recommended that a member of the construction team be trained to handle and remove snakes through a recognised snake handling course;</li> </ul>	Long-term	Local	Low - negative	Moderately detrimental	Unlikely	Low - negative	
<b>PROPOSED ALTERNATIVE WTW</b>														
Loss of faunal habitat and diversity associated with the Plateau Bushveld	Long-term	Site-specific	Moderate - negative	Moderately detrimental	Certain	Moderate - negative		Long-term	Site-specific	Low - negative	Slightly detrimental	Certain	Certain	Moderate - negative
Loss of faunal habitat and diversity associated with the Transformed Habitat	Long-term	Site-specific	Low - negative	Slightly detrimental	Very likely	Low - negative		Long-term	Site-specific	Low - negative	Slightly detrimental	Unlikely	Unlikely	Very low
Loss of faunal SCC associated with the Plateau Bushveld	Long-term	Site-specific	Moderate - negative	Moderately detrimental	Fairly likely	Low - negative		Long-term	Site-specific	Low - negative	Slightly detrimental	Unlikely	Unlikely	Very low
Loss of faunal SCC associated with the Transformed Habitat	Long-term	Site-specific	Low - negative	Slightly detrimental	Unlikely	Very low		Long-term	Site-specific	Low - negative	Slightly detrimental	Unlikely	Unlikely	Very low



Impact	Pre-mitigation:					Recommended mitigation	Post-mitigation:						
	Duration	Extent	Intensity	Consequence	Probability		Significance	Duration	Extent	Intensity	Consequence	Probability	Significance
Degradation of faunal habitat beyond the footprint due to uncontrolled edge effects	Long-term	Local	Moderate - negative	Moderately detrimental	Fairly likely	Low - negative	<ul style="list-style-type: none"> <li>Edge effect control needs to be implemented to prevent further degradation and potential loss of faunal SCC or suitable habitat for such species outside of the footprint areas;</li> <li>Cleared and bare areas are to be rehabilitated and revegetated using an appropriate seed mix that is in line with the current species composition of the vegetation type. Improper revegetation of the focus area can lead to permanent loss of SCC habitat and food resources; and</li> <li>Faunal SCC will likely require rescue and relocation. Walkdowns and rescue and relocation activities as mentioned in the planning phase mitigation measures must be implemented during the construction phase as and when necessary.</li> </ul>	Long-term	Site-specific	Low - negative	Slightly detrimental	Unlikely	Very low

**Table 17. Operational and Maintenance Phase impacts on faunal habitat, diversity, and SCC from the proposed development activities. Required mitigation measures are presented at the bottom of each table section.**

Impact	Pre-mitigation:					Recommended mitigation	Post-mitigation:						
	Duration	Extent	Intensity	Consequence	Probability		Significance	Duration	Extent	Intensity	Consequence	Probability	Significance
<b>PROPOSED MOKOPANE WTW AND ACCESS ROAD</b>													
Loss of faunal habitat and diversity.	Long-term	Site-specific	Moderate - negative	Moderately detrimental	Very likely	Moderate - negative	<ul style="list-style-type: none"> <li>Ensure AIP control plan is implemented and that AIPs are suitably controlled and managed;</li> <li>Stormwater is to be monitored and managed;</li> <li>Culvert systems installed at points where roads intersect EDL, habitat must be monitored and maintained to ensure they do not become filled with debris/overgrowth and allow movement of fauna;</li> <li>No further vegetation clearance is allowed, unless part of mandatory maintenance activities along roadways, fences and inside facilities;</li> <li>No hunting, trapping or setting of snares is to be allowed;</li> <li>The contact details of a suitably qualified snake handler must be made available should a venomous snake be encounter that needs removal. Alternatively, suitable training of select staff members (security team) must be undertaken to effect the safe capture and relocation of snakes;</li> <li>If any spills occur, they should be immediately cleaned up to avoid soil contamination. In the event of a breakdown, maintenance of vehicles must take place with care, and the collection of spillages should be practised preventing the ingress of hydrocarbons into the topsoil;</li> </ul>	Long-term	Site-specific	Moderate - negative	Moderately detrimental	Fairly likely	Low - negative
Loss of faunal SCC	Long-term	Site-specific	High - negative	Moderately detrimental	Very likely	Moderate - negative	<ul style="list-style-type: none"> <li>No on-site open fires are allowed;</li> <li>External lighting should be kept to a minimum with downward facing lights. Yellow or red fluorescent lights should be used while the use of LED lights should be avoided. Lights should not be aimed or cast onto the remaining open space areas;</li> <li>Edge effect control needs to be implemented to prevent further degradation and potential loss of faunal SCC or suitable habitat for such species outside of the footprint areas; and</li> <li>Cleared and bare areas are to be rehabilitated and revegetated using an appropriate seed mix that is in line with the current species composition of the vegetation type. Improper revegetation of the focus area can lead to permanent loss of SCC habitat and food resources.</li> </ul>	Long-term	Site-specific	Moderate - negative	Moderately detrimental	Fairly likely	Low - negative
Degradation of faunal habitat beyond the footprint due to uncontrolled edge effects	Long-term	Site-specific	Moderate - negative	Moderately detrimental	Fairly likely	Low - negative	<ul style="list-style-type: none"> <li>No on-site open fires are allowed;</li> <li>External lighting should be kept to a minimum with downward facing lights. Yellow or red fluorescent lights should be used while the use of LED lights should be avoided. Lights should not be aimed or cast onto the remaining open space areas;</li> <li>Edge effect control needs to be implemented to prevent further degradation and potential loss of faunal SCC or suitable habitat for such species outside of the footprint areas; and</li> <li>Cleared and bare areas are to be rehabilitated and revegetated using an appropriate seed mix that is in line with the current species composition of the vegetation type. Improper revegetation of the focus area can lead to permanent loss of SCC habitat and food resources.</li> </ul>	Long-term	Site-specific	Low - negative	Slightly detrimental	Unlikely	Very low
<b>PROPOSED ALTERNATIVE WTW</b>													
Loss of faunal habitat and diversity.	Long-term	Site-specific	Moderate - negative	Moderately detrimental	Fairly likely	Low - negative	<ul style="list-style-type: none"> <li>No on-site open fires are allowed;</li> <li>External lighting should be kept to a minimum with downward facing lights. Yellow or red fluorescent lights should be used while the use of LED lights should be avoided. Lights should not be aimed or cast onto the remaining open space areas;</li> <li>Edge effect control needs to be implemented to prevent further degradation and potential loss of faunal SCC or suitable habitat for such species outside of the footprint areas; and</li> <li>Cleared and bare areas are to be rehabilitated and revegetated using an appropriate seed mix that is in line with the current species composition of the vegetation type. Improper revegetation of the focus area can lead to permanent loss of SCC habitat and food resources.</li> </ul>	Long-term	Site-specific	Low - negative	Slightly detrimental	Unlikely	Very low
Loss of faunal SCC	Long-term	Site-specific	Moderate - negative	Moderately detrimental	Fairly likely	Low - negative	<ul style="list-style-type: none"> <li>No on-site open fires are allowed;</li> <li>External lighting should be kept to a minimum with downward facing lights. Yellow or red fluorescent lights should be used while the use of LED lights should be avoided. Lights should not be aimed or cast onto the remaining open space areas;</li> <li>Edge effect control needs to be implemented to prevent further degradation and potential loss of faunal SCC or suitable habitat for such species outside of the footprint areas; and</li> <li>Cleared and bare areas are to be rehabilitated and revegetated using an appropriate seed mix that is in line with the current species composition of the vegetation type. Improper revegetation of the focus area can lead to permanent loss of SCC habitat and food resources.</li> </ul>	Long-term	Site-specific	Low - negative	Slightly detrimental	Unlikely	Very low

Impact	Pre-mitigation:					Recommended mitigation	Post-mitigation:						
	Duration	Extent	Intensity	Consequence	Probability		Significance	Duration	Extent	Intensity	Consequence	Probability	Significance
Degradation of faunal habitat beyond the footprint due to uncontrolled edge effects	Long-term	Site-specific	Moderate - negative	Moderately detrimental	Fairly likely	Low - negative	<ul style="list-style-type: none"> <li>No on-site open fires are allowed;</li> <li>External lighting should be kept to a minimum with downward facing lights. Yellow or red fluorescent lights should be used while the use of LED lights should be avoided. Lights should not be aimed or cast onto the remaining open space areas;</li> <li>Edge effect control needs to be implemented to prevent further degradation and potential loss of faunal SCC or suitable habitat for such species outside of the footprint areas; and</li> <li>Cleared and bare areas are to be rehabilitated and revegetated using an appropriate seed mix that is in line with the current species composition of the vegetation type. Improper revegetation of the focus area can lead to permanent loss of SCC habitat and food resources.</li> </ul>	Long-term	Site-specific	Low - negative	Slightly detrimental	Unlikely	Very low

## 5. Conclusion

The assessment of floral and faunal communities within the focus area determined that the Mountain Bushveld and associated EDL is of higher importance and sensitivity than the Plateau Bushveld and Transformed Habitat. The Mountain Bushveld is more intact and less degraded than the Plateau Bushveld, and it provides more suitable habitat for floral and faunal SCCs and is associated with better CBA functioning. The alternative site and associated access road will impact on the 3 ha of Mountain Bushveld (high floral SEI and high faunal SEI) and will have higher significance impacts on floral and faunal communities than the preferred site, that will impact on 7 ha of Plateau Bushveld (medium floral SEI and low faunal SEI).

It is the recommendation of the specialists that the preferred site be pursued and that the proposed alternative and associated access road be avoided. This study provides the relevant information required to implement Integrated Environmental Management (IEM) and to ensure that the best long-term use of the ecological resources in the focus area will be made in support of the principle of sustainable development.

### **3.12. AIR QUALITY IMPACTS (EHRCON, 2023)**

EHRCON (Pty) Ltd (EHRCON) was commissioned to assess the air quality impacts associated with the proposed Mokopane WTW. The objectives of this study were to characterise and describe ambient emissions from the construction, operation, and rehabilitation of the proposed Mokopane WTW and to assess the impact on the health of the receiving community.

The assessment considered a review of the relevant health legislation, ambient air quality guidelines and standards. An overview was given of the prevailing meteorological conditions as well as available data on criteria air pollutant concentrations in the area. A process description and emission inventory were compiled, founded on current emission factors. An evaluation of the potential for human health and environmental impacts, centered on comparisons of modelled pollutant concentrations with relevant guidelines and standards was performed. An assessment of the contribution and outcome of the process on the current air quality, completed the study.

The comprehensive Ambient Air Quality Study can be found in Appendix D.

#### **1. Significance Analysis**

From the emissions inventory the following observations can be made:

- A total emission rate of 0.29 gram per second was calculated for operations.
- The disinfection process, utilising chlorine gas, will most likely be the largest source of ambient pollution (67.1%) followed by vehicle transport emissions (30.9%).
- Particulate matter comprises approximately 32.9% of the pollution load. PM10 is the criteria pollutant of concern and contributes about 4.98% of the pollution load. Total suspended particulates and PM2.5 contribute 26.72% and 1.2% respectively.
- All emissions were regarded as fugitive.

From the impact significance analysis, the following observations can be made:

- The incremental impact of all pollutants during construction/rehabilitation is expected to be negligible. Current industry standard techniques should be maintained and supplemented with administrative control measures to maintain the residual impact at the nearest sensitive receivers at current background levels.
- The incremental impact of particulate pollutants during normal operations is expected to be minor. Current industry standard techniques should be maintained and supplemented with administrative control measures and engineering control to maintain the residual impact at the nearest sensitive receivers at current background levels.
- The incremental impact of gaseous pollutants during normal operations is expected to be negligible. Current industry standard techniques should be maintained and supplemented with administrative control measures to maintain the residual impact at the nearest sensitive receivers at current background levels.

#### **2. Key findings and Conclusion**

The air quality impact study concludes the following:

- The process falls within the Mokgalakwena Local Municipality (MLM), in the Waterberg District Municipality (WDM) of the Limpopo Province.
- Ambient monitoring data from the WBPA Mokopane station was included in the study.
- A total emission rate of 0.29 gram per second was calculated for operations.
- The disinfection process, utilising chlorine gas, will most likely be the largest source of ambient pollution (67.1%).
- Particulate matter comprises approximately 32.9% of the pollution load. PM10 is the criteria pollutant of concern and contributes about 4.98% of the pollution load. Total suspended particulates and PM2.5 contribute 26.72% and 1.2% respectively.
- Dispersion of emissions from the process was modelled using the ISC-AERMOD View model based on the standard Gaussian solution.
- The results present the spectrum from maximum ground level concentration to maximum impact area, and accounts for annual averages.
- Ground level concentrations were predicted for atmospheric conditions based on local meteorological data for the period 1 July 2022 to 30 June 2023.
- For the reporting period winds were mostly from the north easterly sector 60.47%. Calm periods were the exception (1.2%) and wind speeds were most often brisk above 3.6m/s (42.4%). Moderate winds between 2.1 and 3.6m/s occurred 37.6% and light winds, between 0.5 and 2.1m/s 18.6%.
- Predicted incremental dust deposition rates during construction/rehabilitation are expected to remain at current levels and at all the closest receivers. Incremental daily and annual average PM10/2.5 concentrations are predicted to be insignificant at nearest sensitive receivers.
- Predicted incremental dust deposition rates during operations are expected to remain at background levels at all sensitive receivers beyond the project boundary.
- PM10 concentrations, as a result of operations, are likely to remain at background levels at all sensitive receivers beyond the project boundary. Incremental annual PM10 concentrations are predicted to be insignificant at nearest sensitive receivers.
- Predicted incremental maximum daily and annual average PM2.5 concentrations will probably be insignificant at nearest sensitive receivers.
- NO<sub>2</sub>, SO<sub>2</sub> and CO emissions (vehicle tailpipe emissions) were not quantified for the construction/rehabilitation and operational phases of the project due to the relatively low expected risk and since an acceptable vehicle inventory could not be established at this stage.
- The incremental impact of all pollutants during construction/rehabilitation is expected to be negligible. Current industry standard techniques should be maintained and supplemented with administrative control measures to maintain the residual impact at the nearest sensitive receivers at current background levels.
- The incremental impact of particulate pollutants during normal operations is expected to be minor. Current industry standard techniques should be maintained and supplemented with administrative control measures and engineering control to maintain the residual impact at the nearest sensitive receivers at current background levels.



- The incremental impact of gaseous pollutants during normal operations is expected to be negligible. Current industry standard techniques should be maintained and supplemented with administrative control measures to maintain the residual impact at the nearest sensitive receivers at current background levels.
- Ambient monitoring should be used in combination with modelling and emission inventory to assess the effectiveness of control measures at source and receivers, on an annual basis.
- Monitoring of ambient air quality will assist effective air quality management and open communication to all stakeholders.

### **Administrative Measures**

In view of the predicted ambient pollutant concentrations resulting from emissions from the Mokopane WTW, the following is recommended: an annual emissions inventory and modelling regime must be maintained throughout the life of the project.

The ultimate purpose of monitoring is not merely to collect data, but to provide information necessary to make informed decisions on managing and improving the environment. Monitoring fulfils a central role in this process, providing the necessary sound scientific basis for policy and strategy development, objective setting, compliance measurement against targets and enforcement action. However, the limitations of monitoring should be recognised. In many circumstances, measurements alone may be insufficient, or impractical for the purpose of fully defining population exposure. No monitoring programme, however well-funded and designed, can hope to comprehensively quantify patterns of air pollution in both space and time. At best monitoring provides an incomplete, but useful, picture of current environmental air quality. Monitoring often needs to be used in conjunction with other objective assessment techniques, including modelling, emission measurement and inventories, interpolation and mapping.

### **Emissions Monitoring**

In the initial stages of treatment hydrogen sulphide might be stripped from raw water by aeration. The concentrations of hydrogen sulphide can best be determined by sampling and analysing raw and post-aeration water.

### **Best Available Industry Techniques**

Fugitive Emissions from Paved Surfaces:

The following measures are aimed at reducing fugitive dust emissions from paved surfaces:

- Construction integrity of all paved areas should be regularly inspected and frequently repaired if required.
- Carefully control load size and set a speed limit of 10km/h for all onsite vehicles.
- Minimise travelling distance and unnecessary traffic through good site layout and process design.
- Measures to which entail periodic removal of deposited material, i.e. broom and vacuum sweeping, may also be adopted to reduce dust generation.

### **No-go alternative (compulsory)**

Should the NO-GO alternative be pursued, there will be no reduction in the commercial and domestic water demand in the region. The socio-economic benefit (as discussed under Section A: Activity Motivation) from the WTW will not be realised, and an opportunity to establish a WTW near Mokopane to supply residents and commercial users will be foregone. Furthermore, from a long-term perspective, the potential employment opportunities associated with the operational phase would be reduced and the operational spend would also be reduced. Other potential positive socio-economic impacts as discussed in the SIA, will not materialise.

The opportunity to reduce the resilience of potable water supply from distant WTW (such as the existing Flag Moshielo WTW) will be lost. Mokopane residents and commercial users, and the larger Mogalakwena region will not benefit from the WTW.

From an agricultural impact perspective, there is no preferred alternative between the no-go and the development. There are no agricultural impacts of the no-go alternative, but this is not significantly different from the very low impact of the proposed development.

Based on the Draft SIA, the no-go alternative would hinder the execution of the national strategic plans aimed at providing potable water to communities for social use. The overall impact associated with not proceeding with the proposed WTWs would entail the failure of the OMM programme to fully align with the country's plan on infrastructure development, especially the provision of potable water to social users. Specifically,

- The selected doorstep communities front the Northern limb (as per the Water Management Master Plan) will not have access to potable water.

In reference to the defence compliance assessment, the "no go" option does not satisfy the project requirements because it contradicts the core objectives of providing potable water to the residents and commercial users, violates previous approvals and authorizations, neglects the needs of the community and industries, and goes against established water service development plans and broader program objectives for effective water resource management in the region.

Overall, the environmental impacts associated with the proposed development are considered to have a "moderate to low" risk significance, with mitigations, of an acceptable level the risk significance can be reduced and adequately managed with the implementation of effective mitigation methods. The mitigation measures are presented in the EMPr and the specialists reports.

The EMPr can be found in Appendix F, and specialists reports in Appendix D.

## **Alternative B**

**Refer to Alternative A (preferred site) above, the Alternative B (alternative site) is also discussed in this section.**

## **Alternative C**

Not applicable

**For more alternatives please continue as alternative D, E, etc.**

## SECTION E. RECOMMENDATION OF PRACTITIONER

Is the information contained in this report and the documentation attached hereto sufficient to make a decision in respect of the activity applied for (in the view of the environmental assessment practitioner)?

YES	NO
-----	----

If “NO”, indicate the aspects that should be assessed further as part of a Scoping and EIA process before a decision can be made (list the aspects that require further assessment):

Not applicable

If “YES”, please list any recommended conditions, including mitigation measures that should be considered for inclusion in any authorisation that may be granted by the department in respect of the application:

Condition 1: The EMPr must be fully complied with and included in all tender documentation.

Condition 3: The treatment residue be sold to off-takers (such as the mines or farmers) for further re-use as opposed to disposing it to a licenced landfill or discharging into the freshwater ecosystem.

Condition 4: All positive impacts (detailed in this BAR, EMPr, and the attached specialists reports) must be optimized as practical as possible.

Condition 5: Based on the EAP statement, specialists findings and their conclusions, it is recommended that the preferred site be pursued and alternative site must be avoided.

Condition 6: Prior to construction, the relevant authorities must be consulted since the proposed site is situated within a Category 1 CBA and National Protected Area (i.e., also considered a UNESCO World Heritage Site). Section 50 (5) of the NEMPAA states that: “No development, construction, or farming may be permitted in a nature reserve or world heritage site without the prior written permission of the management authority.”

Is an EMPr attached?

YES	NO
-----	----

The EMPr must be attached as Appendix F.

*Note from Zutari: The Environmental Management Programme (EMPr) has been included as Appendix F.*

## SECTION F: APPENDIXES

The following appendixes must be attached as appropriate:

Appendix A: Site plan(s)

Appendix B: Photographs

Appendix C: Facility illustration(s)

Appendix D: Specialist reports

Appendix E: Comments and responses report

Appendix F: Environmental Management Programme (EMPr)

Appendix G: Other information

## SECTION G: DECLARATION BY THE ENVIRONMENTAL ASSESSMENT PRACTITIONER

I, Deon Esterhuizen, declare that I –

- (a) act as the independent environmental practitioner in this application;
- (b) do not have and will not have any financial interest in the undertaking of the activity, other than remuneration for work performed in terms of the Environmental Impact Assessment Regulations, 2014;
- (c) do not have and will not have a vested interest in the proposed activity proceeding;
- (d) have no, and will not engage in, conflicting interests in the undertaking of the activity;
- (e) undertake to disclose, to the competent authority, any material information that has or may have the potential to influence the decision of the competent authority or the objectivity of any report, plan or document required in terms of the Environmental Impact Assessment Regulations, 2006;
- (f) will ensure that information containing all relevant facts in respect of the application is distributed or made available to interested and affected parties and the public and that participation by interested and affected parties is facilitated in such a manner that all interested and affected parties will be provided with a reasonable opportunity to participate and to provide comments on documents that are produced to support the application;
- (g) will ensure that the comments of all interested and affected parties are considered and recorded in reports that are submitted to the Department in respect of the application, provided that comments that are made by interested and affected parties in respect of a final report that will be submitted to the Department may be attached to the report without further amendment to the report;
- (h) will keep a register of all interested and affected parties that participated in a public participation process; and
- (i) will provide the Department with access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not.



---

**Signature of the Environmental Assessment Practitioner:**

Zutari Ndodana Joint Venture (ZNJV)

**Name of company:**

02 October 2023

**Date:**