



# **Proposed subdivision and consolidation plan for Erf 6 and 7 of Orchards View Ext 1, City of Mbombela, Mpumalanga Province**

**Draft Environmental Authorisation Amendment Report**

6 June 2023

## **CORE Environmental Services**

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## EXECUTIVE SUMMARY

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Busamed purchased Orchards View Extension 1 for the purposes of constructing the Busamed Acute Hospital on these premises. Due to various reasons, Busamed is no longer intending on constructing the acute hospital on this property and is therefore proposing to sell Orchards View Ext 1 to another prospective developer. Busamed is proposing to increase the developable area of Orchards View Ext 1, in order to increase the property value and the likelihood of the property being sold. For this reason, Busamed is submitting a request to amend the existing Environmental Authorisation (EA) for the rezoning, subdivision and consolidation of the property, in order to increase the developable area of Orchards View Extension 1.

Zolozest INV (PTY) Ltd, subsidiary of the Busamed Group, appointed a town planner and environmental consultant to submit an application for the subdivision, consolidation and rezoning of the property and for the amendment of the Environmental Authorisation as per the National Environmental Management Act 107, of 1998. (NEMA, 107 of 1998).

The subdivision of Orchards View Ext 1 includes the changing of the approved open space area and implementing a buffer for the wetland area as proposed by the initial Environmental Impact Assessment and Wetland Study undertaken. The open space area was however originally implemented and approved for the purposes of managing storm water. The amendment of this condition would therefore require new assessments to be undertaken and measures to be implemented to ensure that storm water does not affect the adjacent wetland and newly constructed attenuation pond. For these reasons, a Stormwater Report / Hydrological Report and Wetland Assessment was undertaken to assess the impacts of the proposed change on the adjacent wetland, considering existing and future developments of the project area.

Following these assessments, the following conclusions can be made:

- According to the Wetland Assessment undertaken, the existing Public Open Space area, can be converted to development area if a 10m wetland buffer is adhered to;
- Green infrastructure must be implemented outside the 10m wetland buffer to reduce the flow of storm water on site before it enters the adjacent watercourse. Eco-logs must also be used to ensure further reduction of the velocity of the storm water before it enters the watercourse;
- The implementation of the 10m buffer and additional 5m for the green stormwater infrastructure will result to the developable area being increased to 41 274m<sup>2</sup>, thereby increasing the developable area with 10 924m<sup>2</sup>.

A summary of the specialist assessments is noted in Section 4 of the EA Amendment Report and the impacts associated with the proposed amendment were assessed in Section 7. Following the assessment of the impacts, it was noted that the proposed changes would not have a significant negative impact on the adjacent wetland, if the recommended measures included within the Specialist Assessments, EA Amendment Report and Draft Environmental Management Plan are implemented.

It is therefore the opinion of the EAP that the existing Environmental Authorisation be amended to include the proposed amendment, as the impacts can effectively be mitigated by implementing the green infrastructure as proposed within the Storm Water Proposal Report.

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## ABBREVIATIONS

BAR	Basic Assessment Report
CBA	Critical Biodiversity Area
EA	Environmental Authorisation
GNR	General Notice Regulation
I&AP	Interested and Affected Party
LIA	Late Iron Age
MDARDLEA	Mpumalanga Department of Agriculture, Rural Development, Land and Administration
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NHRA	National Heritage Resources Agency
PPP	Public Participation Process

# 1. OVERVIEW OF THE PROJECT

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## 1.1 Introduction

An application for Environmental Authorisation (EA) for the residential and commercial township development of approximately 34.7Ha was approved in 2011 (DARDLEA Ref: 17/2/2/2 MP-54) on portion 5 and a portion of the remaining extent of the farm South African Prudential Citrus Estates 131-JU, and a portion of the remainder of Portion 1 of the farm Nelspruit Reserve 133-JU, within Nelspruit. Following the approval of the EA Application, various applications for amendments were submitted for the subdivision of the property, change of ownership and change of property name and details. Following all the amendments applied for, the fifth amendment entailed the approval of the 35.9Ha residential, retail and commercial township development on portions 1, 2 and 3 of the farm Orchards View 100-JU. According to the fifth amendment of the EA issued in May of 2018, Orchards Extension 1 was authorised for the following purposes:

- Public Open Space; and
- Special Purposes

Busamed purchased the property (Orchard View Ext 1) for the purposes of constructing the Busamed Acute Hospital on these premises. Due to various reasons, Busamed is no longer intending on constructing the acute hospital on this property and is therefore proposing to sell Orchards View Ext 1 to another prospective developer. Busamed is proposing to increase the developable area of Orchards View Ext 1, in order to increase the property value and the likelihood of the property being sold. For this reason, Busamed is submitting a request for the subdivision and consolidation of the property.

Zolozest INV (PTY) Ltd, subsidiary of the Busamed Group, appointed a town planner and environmental consultant to submit an application subdivision, consolidation and rezoning of the property and for the amendment of the Environmental Authorisation as per the National Environmental Management Act 107, of 1998. (NEMA, 107 of 1998). Busamed is also proposing to rezone the property to “Business” for the following purposes:

- Auction centre
- Bulk retail trade
- Dwelling units
- Hotel
- Office,
- Vehicle sales
- Market
- Wholesale trade
- Retail shop
- Service retail

The subdivision of Orchards View Ext 1 includes the changing of the approved open space area and implementing a buffer for the wetland area as proposed by the initial Environmental Impact Assessment and Wetland Study undertaken. The open space area was however originally implemented and

approved for the purposes of managing storm water. The amendment of this condition would therefore require new assessments to be undertaken and measures to be implemented to ensure that storm water does not affect the adjacent wetland and newly constructed attenuation facility.

**Core Environmental Services** was subsequently appointed as an independent Environmental Consultant, to apply for the amendment of the Environmental Authorisation by means of conducting a Part 2 Environmental Authorisation Amendment Process in accordance with GNR 982, 2014 (as amended in 2017).

## 1.2 Location

The project area is on portion 1 of the farm Orchards View 100-JU, Erf 6 and 7 of Orchards View Ext 1, within Mbombela in Mpumalanga Province. This property is located on the southern side of the Samora Machel Drive as it leaves Nelspruit town. The Crocodile Valley intersection is to the east and the Fresh Produce Market is located to the south-east.

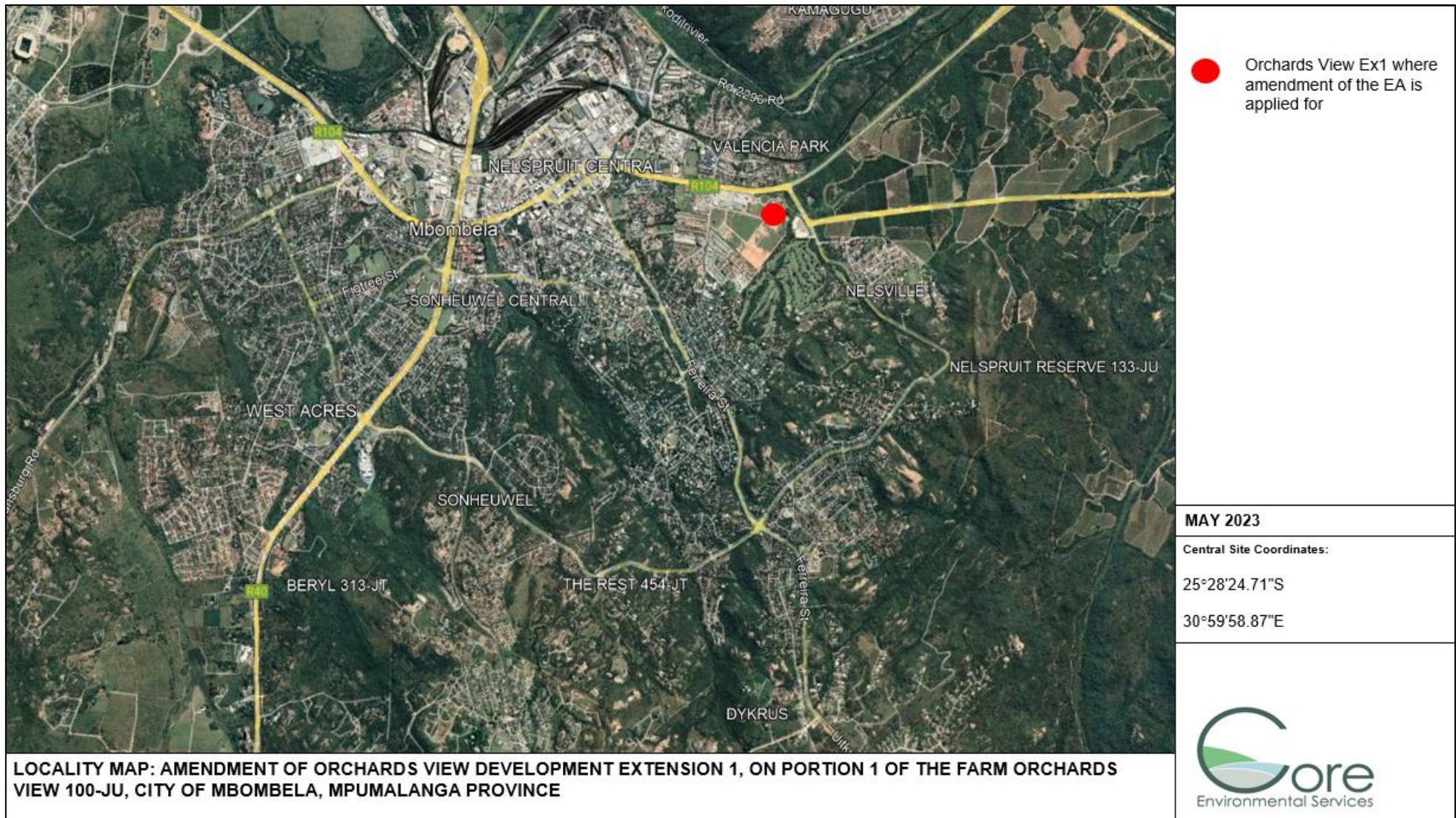
**Coordinates:**

Latitude: 25°28'24.71"S

Longitude: 30°59'58.87"E

Please refer to the locality map below, Figure 1. The Layout Map is attached as Appendix A.





**FIGURE 1: LOCALITY MAP – PROPOSED AMENDMENT OF ORCHARDS VIEW EXT 1, CITY OF MBOMBELA, MPUMALANGA**

## 1.3 Details of the EAP

Ms. Anne-Mari White, is an Environmental Specialist, who started her studies at the North-West University (NWU) and completed her Bachelor of Science: Environmental Management at the University of South Africa (UNISA) in 2007. Ms. White is registered with the Environmental Assessment Practitioners Association of South Africa (EAPASA Reg No: 2020/602) as well as the South African Council for Natural Scientific Professionals as a Certificated Natural Scientist (Reg. No 300067/15). In addition to her qualification, she completed short courses in soil classification and wetland delineations (Terrasoil Science), Geographic Information Systems (University of KwaZulu-Natal), and Environmental Impact Assessments (NWU).

## 1.4 Policy, Legal and Administrative Framework

TABLE 1: LEGISLATION APPLICABLE TO THE PROJECT

Applicable legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments considered	Project application and type (permit / licence / authorisation / comment)
The Constitution of South Africa, Act No. 108 of 1996	<p><b>The Applicant</b> will be required to adhere to the Environmental Management Programme (EMPr) requirements to ensure that social and environmental management considerations are considered and implemented.</p> <p>As per Section 25 the Constitution, a public participation process (PPP) was and will continue to be undertaken, as this is considered to be an essential mechanism for informing stakeholders of their rights and obligations in terms of the project and amendment proposed.</p>
National Environmental Management Act, 1998 (Act No. 107 of 1998)	<p>Initial Environmental Authorisation was obtained in 2011. Following this approval, various amendments were applied for, and the last EA Amendment was therefore approved in May 2018. As an amendment of the EA is required, the existing EA will have to be amended by means of conducting a Part 2 EA Amendment Process as regulated within GNR982 of 2014 (as amended in 2017).</p>
National Biodiversity Act, 2004 (Act No. 10 of 2004)	<p>The act provides for the management and conservation of South Africa's biodiversity within the framework of the National Environmental Management Act, 1998; the protection of species and ecosystems that warrant national protection; the sustainable use of indigenous biological</p>



	<p>resources, the fair and equitable sharing of benefits arising from bioprospecting involving indigenous biological resource; the establishment and functions of a South African National Biodiversity Institute; and for matters connected therewith.</p> <p>The National Biodiversity Act, 2004, must therefore be considered prior to the clearance of vegetation to minimise the impact on the terrestrial biodiversity.</p>
National Water Act, 1998 (Act No. 36 of 1998)	<p>The activities proposed will have an impact on the adjacent watercourse and the Act subsequently aims to protect the water resources by means from over consumption and pollution, and sedimentation.</p> <p>Activities taking place within a close proximity to the water resource, will subsequently require a Water use License in accordance with the National Water Act 36 of 1998.</p>
Occupational Health and Safety Act, 1998 (Act No. 85 of 1998)	<p>The Act provides for the health and safety of people at work and for the health and safety of people using plant and machinery.</p> <p>During establishment, work must be conducted with strict adherence to the Occupational Health and Safety Act 85 of 1998.</p>

## 1.5 National Environmental Management Act 107 of 1998

In accordance with the National Environmental Management Act 107, of 1998, the following listed activities were triggered and approved by the DARDLEA in 2011.

### GNR 386, 2006, Activity 1(k):

*The bulk transportation of sewage and water, including storm water in pipelines with an internal diameter of 0.36m or more; or a peak throughput of 120 litres per second or more.*

### GNR 387, 2006, Activity 2:

*Any development activity, including associated structures and infrastructure, where the total area to be developed is, or is intended to be 20 hectares or more.*

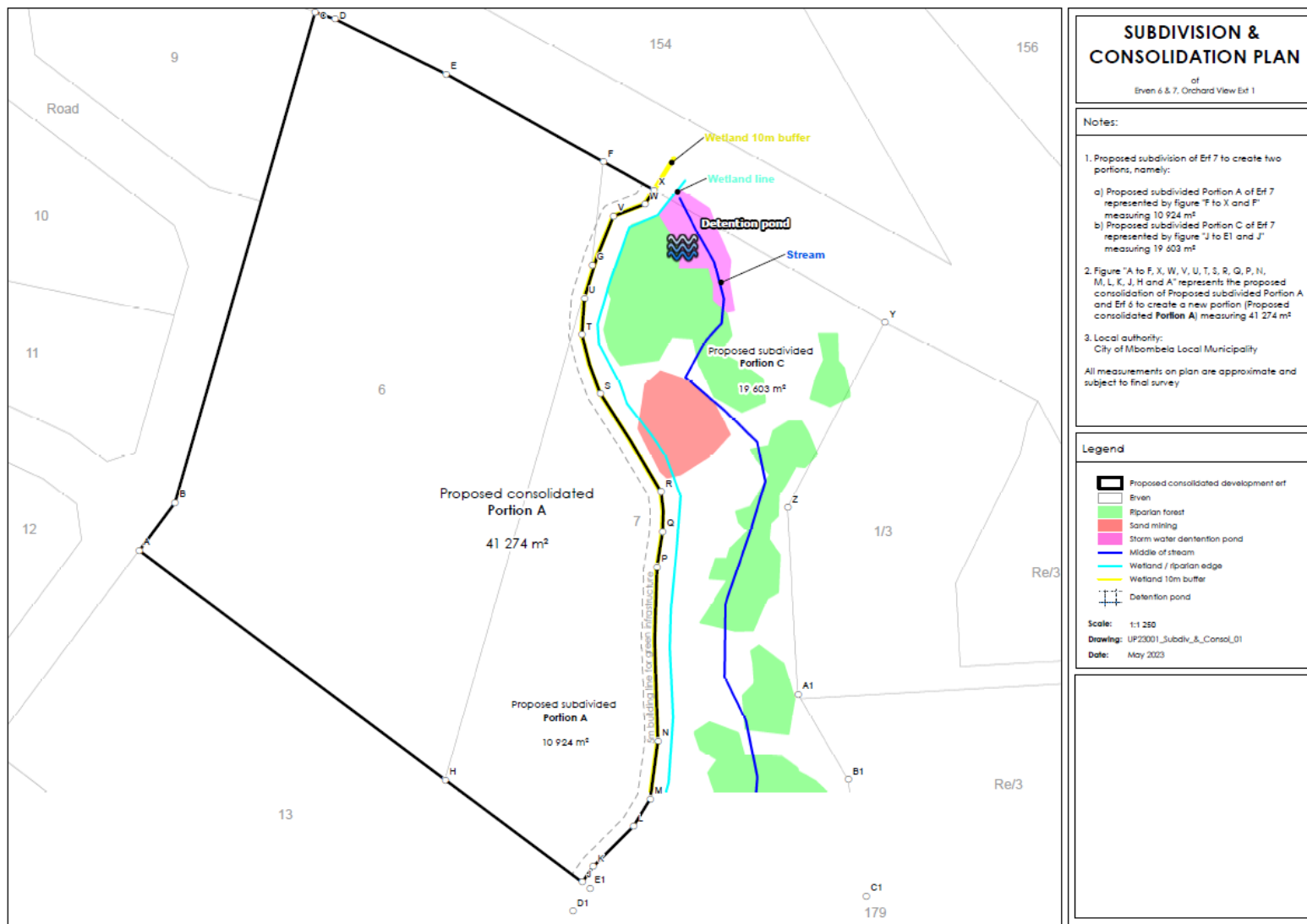
It must be noted that the subdivision, consolidation, and rezoning of the project area does not constitute a listed activity and for this reason the EA Amendment process is undertaken to amend the existing Environmental Authorisation (EA) issued in 2011, with the last amendment issued in 2018.

## 1.6 Description of the project

Busamed is proposing to increase the developable area of Orchards View Ext 1, in order to increase the property value and the likelihood of the property being sold. The wetland assessment undertaken in 2011, recommended a wetland buffer of 10m and therefore the owner of the property is submitting an EA Amendment Application to increase the developable area and decrease the area currently zoned for Open Space. The subdivision plan to be submitted is recommending a 15m wetland buffer, which is more than the recommended 10m buffer of the Wetland Specialist Report undertaken in 2010.

The applicant is also proposing to rezone the property to “Business” for the following uses:

- Auction centre
- Bulk retail trade
- Dwelling units
- Hotel
- Office
- Vehicle sales
- Market
- Wholesale trade
- Retail shop
- Service retail



**FIGURE 2: SUBDIVISION AND CONSOLIDATION PLAN, ORCHARDS VIEW EXT 1**

## 1.7 Need and Desirability

Busamed purchased Orchards View Ext 1 (Erf 6 and 7) for the purpose of constructing the Busamed Acute Hospital on this property. Due to various reasons, Busamed is no longer intending to construct the acute hospital on this property and is therefore proposing to sell Orchards View Ext 1 to another prospective developer.

Within the previous layout approved for Orchards View Ext 1, (P2562\_Ext1\_02, dated February 2018), Erf 7 within Orchards View Ext 1 was zoned as open space and in accordance with the Environmental Authorisation issued, and no development or hardening of surfaces are allowed within the private open space (Erf 7). In order to increase the likelihood of the property being sold and increase the property value of portion 6 and 7 of Orchards View Ext 1, the developable area of Orchards View Extension 1 must increase. For this reason, an application for amendment of the Environmental Authorisation is submitted, subject to the implementation of mitigation measures to mitigate the probability of storm water impacting the adjacent watercourse.

## 2. PUBLIC PARTICIPATION PROCESS

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The purpose of this chapter is to provide an outline of the public participation process (PPP) to date and the way forward with respect to the EA Amendment process.

Consultation with the public forms an integral component of the EA process. This process enables Interested and Affected Parties (I&APs) (e.g. directly affected landowners, national-, provincial- and local authorities, and local communities etc.) to raise their issues and concerns regarding the proposed activities, which they feel should be addressed in the EA Amendment process. The PPP has thus been structured such as to provide I&APs with an opportunity to gain more knowledge about the proposed amendment, to provide input through the review of documents/reports, and to voice any issues or concerns at various stages throughout the process.

All the parties identified as an I&AP (surrounding landowners, relevant departments, stakeholders, local and district authorities) have automatically been registered in the I&APs database for the project. The registered I&AP list is attached as **Annexure C.1**.

The draft Environmental Authorisation Amendment Report will be made available for public review from June 2023 – July 2023.

All comments received will be included within the Final EA Amendment Report to be submitted to the DARDLEA.

## 3. DESCRIPTION OF THE AFFECTED ENVIRONMENT

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The description of the affected environment below draws on existing knowledge from published data, previous studies, specialist investigations, site visits to the area and is used to understand the possible effects of the proposed project on the environment.

### 3.1 Topography

The topography of the Mbombela municipal area ranges from approximately from 2000 m -200m above mean seal level (amsl) in a west-eastern direction across the municipality. The project area lies at approximately 665 m amsl and slopes from south-west to north-east where the watercourse is located.

### 3.2 Climate

The study site and the surrounding areas are characterised by a humid sub-tropical climate with mild winters and warm summers. The average daily temperature fluctuates from 6°C in winter (June-July) to 29°C in summer (January-February). Generally, Mean Annual Precipitation is approximately 800mm. The rainfall regime is typical of savanna regions, consisting of short, intense storm events during the rainy season. The highest rainfall figures are recorded in December and January.



### 3.3 Geology and Soils

A large portion of the area is underlain by the Granite Group, which covers most of the Central, Northern and Eastern areas. It has highly permeable and erodible, colluvial sands and residual soil overlying granitic bedrock (Potassic Gneiss and Migmatite), estimated to be between 2.99-3.10 billion years old. The area north of Mbombela is underlain by dolomite of the Chuniespoort of the Transvaal foundation (approx. age 2.55-2.20 Ga). The western part has a more complex geology with rock types such as Shale, Dolomite, Quartzite, Andesite, Ultramafic rocks and Gneiss. The aforesaid Dolomitic rocks give rise to karst features, with the most notable one being the 1.8 km Sudwala Caves (IDP, 2016-2017).

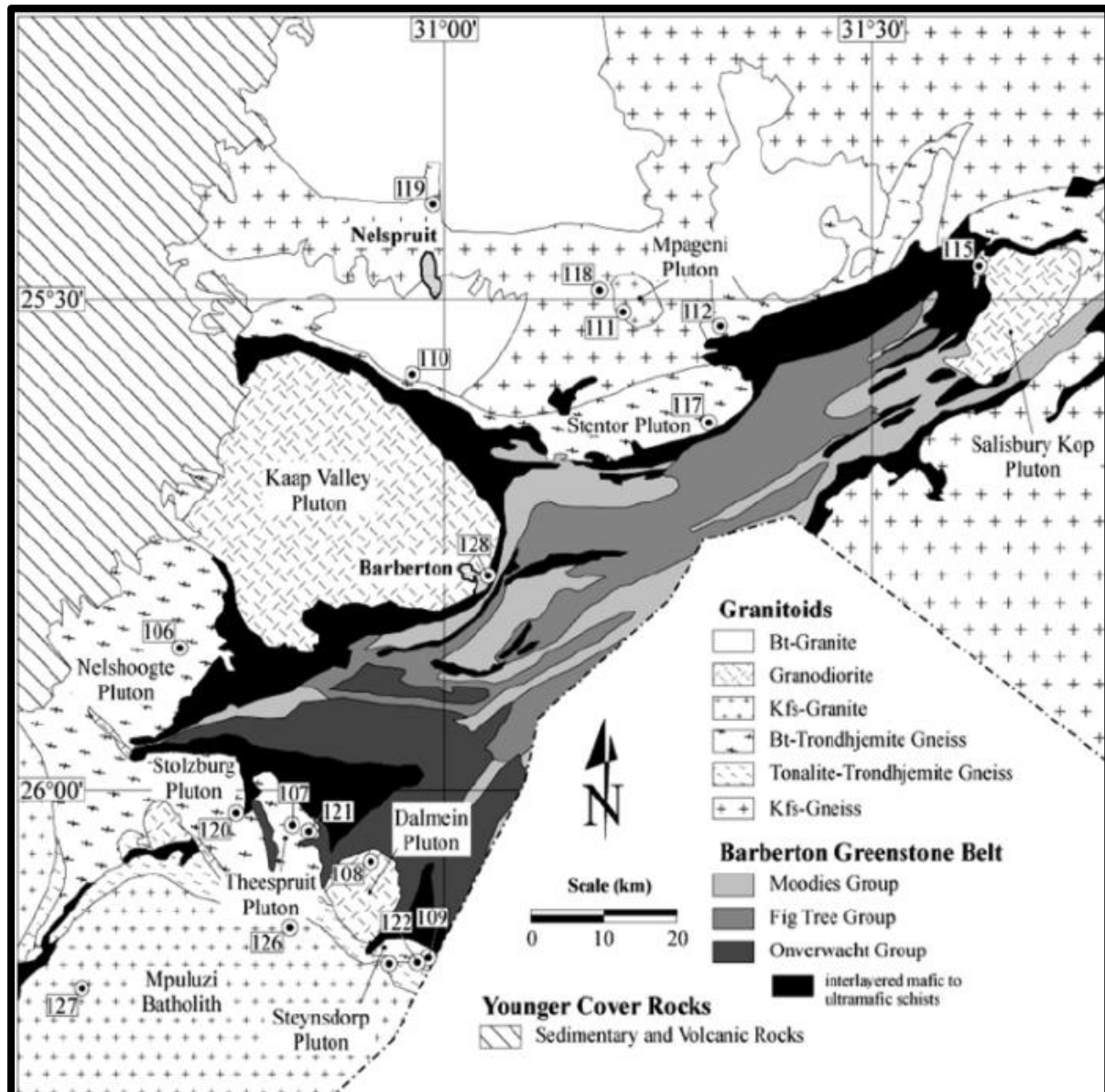


FIGURE 3: GEOLOGY OF THE AREA

### 3.4 Vegetation and Habitat

Orchards View Ext 1 has previously been cleared of vegetation (Citrus) trees, for the purposes of construction, until construction on this portion of the development area was halted. The larger portion of the site has therefore been disturbed and is currently vacant.

As for the wetland area, it is noted that the watercourse located on the eastern boundary is perennial and originates further to the east in the foothills of Steiltes and flows from south to north. As part of the present authorized stormwater management plan a storm water detention pond was constructed within the watercourse in order to attenuate storm water.

The affected watercourse is classified as a Channeled Valley Bottom Wetland (CVBW, situated on the valley floor) with lateral seepage zones (situated on the banks of the CVBW). This wetland is not listed as a priority wetland on the NFEPA data or on the Mpumalanga Biodiversity Sector Plan. The channeled flow is from south to north and seepage flow is from west to east. The riparian edge was used to delineate the watercourse as it is situated on the outer margin of the wetland.

A riparian zone, typified by large riparian trees, including fragmented riparian forest is present on the channel banks and wetland margin and is possibly the remnants of a much more intact riparian forest in historic times. The outer margin of the riparian area is severely infested by alien invasive vegetation. However, the space beneath the fragmented riparian forest is clear of alien vegetation and covered with an organic layer of dead leaves. This is a clear indication that any disturbance to the riparian forest is not recommendable. It is evident that surface water run-off flows across the forest floor without any signs of erosion, this is a further indication on the important function the forest provided by stabilizing the geomorphology of the wetland. In contrast, the area immediately adjacent to the forest where vegetation has been removed is severely eroded as result of surface water run-off. There are clear signs that an earth moving vehicle has recently disturbed the central section of the wetland and has removed sand from the permanent zone.

The overall PES for this wetland unit is calculated as a Category C / D = Moderately / Largely Modified.

### 3.4 Land use

The proposed site is located within an urban area which have already been approved for development. All surrounding and adjacent areas within the Orchards Development is currently under construction.

### 3.5 Socio-Economic

Mbombela Local Municipality has a GGP value of R 73 billion, which makes up 12.2% of the total GGP of Mpumalanga. The main sectors are finance and business sector (22%) manufacturing (17%), general government services (17%) as well as trade and accommodation (13%) (IDP, 2016-2017). Mbombela Local Municipality has experienced a decreased growth rate since 2007. The municipality's growth rate is approximated at 2%, which in turn means that the municipality has not recovered from the recession as of 2011. Mbombela has an unemployment rate of 28.14%. Unemployment is generally high amongst youth, women and people with disabilities (IDP, 2016-2017).

## 4. SUMMARY OF THE SPECIALIST ASSESSMENTS UNDERTAKEN

As part of the EA Amendment process, the impact on the watercourse will have to be revisited as the enlargement of the development area and the decreasing of the “Open Space” area, will affect the ability of the area to naturally mitigate the impacts resulting from storm water. Permanent measures will have to be implemented to minimize the impact of storm water on the adjacent watercourse and riparian area. For this reason, the Wetland Assessment was revised, and a Hydrological / Stormwater Assessment was undertaken to assess the impacts of the proposed changes on the adjacent sensitive environment.

### 4.1 Wetland Assessment

According to the proposed layout plan the development land will encroach into the northern part of the wetland. This would result in the direct loss of the riparian forest and the diversion of flow in the wetland. The development would result in the hardening of the catchment surface feeding the wetland. This would reduce the amount of sub-surface water flow feeding these wetlands and result in the drying of these wetlands. It would however result in an increase in surface water flow into the wetland, via storm (surface) water runoff. The narrowing and diversion of the wetland would reduce its ability to control erosion, and attenuate flooding and control stream flow, functions which become more important with the hardening of the surrounding catchments.

The affected watercourse is classified as a Channeled valley bottom wetland (CVBW, situated on the valley floor) with lateral seepage zones (situated on the banks of the CVBW). This wetland is not listed as a priority wetland on the NFEPA data or on the Mpumalanga biodiversity Sector Plan but is characterized as an Ecological Support Area. The classification and attributes of the Wetland is tabled below:

**TABLE 2: WETLAND CLASSIFICATION AND ATTRIBUTES**

Classification and attributes									
Ref. No.	Level 1 Spatial setting	Level 2 Regional setting / Veg type	Level 3 Landscape setting	Level 4 Hydrogeo-morphic	Level 5 Hydrological regime	Level 6 Descrip-tors	NFEPA Listing	MBSP Listing	Wetland condition
HGM 1	Inland	Lowveld Group 7	Valley floor	Channelled valley bottom	Perennial	Natural	Not Listed	Not Listed	Z1

The channelled flow is from south to north and seepage flow is from west to east. The riparian edge was used to delineate the watercourse as it is situated on the outer margin of the wetland. It is evident that surface water run-off flows across the forest floor without any signs of erosion, this is further indication on the important function the forest provided by stabilizing the geomorphology of the wetland. In contrast, the area immediately adjacent to the forest where vegetation has been removed is severely eroded as result of surface water run-off. There are clear signs that an earth

moving vehicle has recently disturbed the central section of the wetland and has removed sand from the permanent zone.

The WET-Health (Macfarlane et al. 2009) methodology was used to evaluate the integrity and the present ecological state of the wetland as it evaluates the general and readily-observable perceived impacts on a specific watercourse segment in the field. The overall PES for this wetland units is calculated as a Category C / D = Moderately / Largely Modified.

The MTPA handbook suggests that the DWS tool for buffer zones can be used to calculate an effective buffer instead of applying the generic 100m buffer zone. The DWS tool (The Water Research Commission report: *Buffer zone guidelines for wetlands, rivers and estuaries* (Macfarlane & Bredin, 2017) were therefore applied to aid in watercourse classification and determining the need and extent of aquatic buffer zones. This model considers potential impacts of the proposed activity on the integrity of the freshwater ecosystems and calculates a buffer zone that will be effective to mitigate the consequences of potential impacts. The calculated buffer zone is 10m wide. One exception where the buffer size can be relaxed is where roads and infrastructure are present where a large buffer is illogical and will not serve a purpose.

The Wetland Assessment found that the riparian forest (however relatively small) serves an important function in stabilizing the wetland and providing erosion control functions. For these reasons it is not recommended that the development activities encroach into the wetland / riparian zone. To ensure that the potential impacts on the wetland / riparian zone is mitigated, the following conditions and mitigation measures must form part of the environmental management programme:

- To ensure that the wetland / riparian zone is not directly affected, the layout plan must be amended to ensure that the buffer line forms the outside edge of development land.
- The calculated buffer zone of 10m must be cordoned off before any development activities are commenced with. The 10m buffer line will form the absolute line beyond which no activities are allowed with exception of management activities included with the EMP.
- During site preparation all spoil material must be pushed into the opposite direction of the buffer line from where it must be disposed of.
- Storm water mitigation must be designed and implemented as per the green engineering methods proposed by the civil engineer.
- The sandy soil is highly susceptible to erosion, during construction efficient measures must be provided to prevent and manage this impact.
- During the operational phase potential soil erosion must be monitored and addressed.
- The wetland / riparian zone is severely infested with alien invasive vegetation. This impact must be managed by the owner.
- Additional riparian trees must be planted in the riparian zone to redress the historic loss of indigenous vegetation and to improve the ecological importance of this zone. A specialist must be appointed to assist with this task.
- The wetland / riparian zone has the potential to add value to the larger development land if it is well managed and may be used as place of recreation by the residents.
- If any of these conditions and mitigation measures are to be successful ownership and responsibility of this parcel of land must be clearly defined in the EMP and has to be transferred to any future owners.





**FIGURE 4: BIOPHYSICAL FEATURES OF THE SITE (WETLAND CLASSIFICATION)**



## 4.2 Hydrological / Stormwater Assessment

An attenuation structure was previously constructed to reduce the post-development runoff from the area to the calculated pre-development runoff. During the time the area had not yet been developed and certain assumptions were made on order to calculate the foreseen post-development runoff. The existing attenuation pond was designed to ensure that adequate attenuation of the post development peak flows are obtained. The attenuation (dry) pond help control the rate of flow by maintaining pre-development flows. The attenuation pond ensures that the flow rates for the pre-development and post-development is maintained before discharging into the existing box culvert. This also ensures that the flow rate at the downstream pipe culvert is maintained. The Hydrological Assessment / Stormwater Assessment would confirm if the assumptions made during the design of the attenuation pond remains relevant to the actual development which has taken place since.



**FIGURE 5: EXISTING STORMWATER ATTENUATION POND**

### Pre-Development Scenario:

The drainage areas were divided into four catchment areas A, B, C and D as shown in Figure 5 below. These areas have relatively flat slopes with an average calculated slope of between 6% and 10%. The stormwater runoff from catchment areas A, B, C and D are conveyed to an existing culvert, a hardened from the pre-development scenario while catchments B, C and D were assumed as undeveloped.



**FIGURE 6: PRE-DEVELOPMENT CATCHMENT AREAS**

### Post-Development Scenario

The post-development scenario is divided into twenty catchment areas A-T, as per the original stormwater attenuation pond design report. The flow from catchment areas A, B, C, D, E, F, G, H, I, J, K, M, N, O, P and Q is conveyed through a piped stormwater system and discharges at Node C (existing box culvert). This stormwater system consists of kerb inlets, grid inlets, field inlets, junction boxes and headwall structures.

A capacity analysis for the existing culvert at Node A was done to assess the impact of post-development discharge at the existing pipe culvert. The analysis indicated that the existing culvert is already under capacity for pre-development flow. The utilization of the culvert structure at Node A had been omitted and the stormwater design was done conveying the stormwater past Node A to Node C. The post-development stormwater design thus alleviates downstream intake due to the fact that the tributary area now contributes to Node C, an existing box culvert. All pre- and post-development stormwater runoff calculations were done in the design report of the existing attenuation pond.





FIGURE 7: POST-DEVELOPMENT CATCHMENT AREAS

TABLE 3: SUMMARY OF THE RESULTS

Drainage Nodes	Pre-development	Post-development
Drainage Node A		
Catchment Areas Contributing	Drainage Area A	N/A (Refer to Conclusion)
Peak flows (Q <sub>1:5</sub> ) m <sup>3</sup> /s	1.662	
Peak flows (Q <sub>1:20</sub> ) m <sup>3</sup> /s	2.920	
Drainage Node C		
Catchment Areas Contributing	Drainage Area B, C, D	Drainage Area A, B, C, D, E, F, G, H, I, J, K, M, N, O and P
Peak flows (Q <sub>1:5</sub> ) m <sup>3</sup> /s	1.960	6.238
Peak flows (Q <sub>1:20</sub> ) m <sup>3</sup> /s	3.444	9.899
Drainage Node B		
Catchment Areas Contributing	Drainage Area D	Drainage Area R, S, T, L and Q
Peak flows (Q <sub>1:5</sub> ) m <sup>3</sup> /s	0.280	2.270
Peak flows (Q <sub>1:20</sub> ) m <sup>3</sup> /s	0.493	3.547
Drainage Node D		
Catchment Areas Contributing	Drainage Area B, C, D, E	Drainage Area A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T & E(pre-dev)
Peak flows (Q <sub>1:5</sub> ) m <sup>3</sup> /s	2.254	2.254
Peak flows (Q <sub>1:20</sub> ) m <sup>3</sup> /s	3.961	3.961

**TABLE 4: INCREASE IN PERCENTAGE STORMWATER RUNOFF**

Drainage Node	1 in 5 Year Pre-development run-off	1 in 5 Year Post-development run-off	Percentage increase in run-off
A	1.662 m <sup>3</sup> /s	0.0 m <sup>3</sup> /s	0.00 %
B	0.280 m <sup>3</sup> /s	2.270 m <sup>3</sup> /s	700 %
C	1.960 m <sup>3</sup> /s	6.238 m <sup>3</sup> /s	218 %
D	2.254 m <sup>3</sup> /s	2.254 m <sup>3</sup> /s	0.00 %

The percentage increase of runoff at drainage Node B and C is due to the increase in the contributing areas and also the change in runoff factors due to post-development characteristics. The pre-development area that contributed to Node A, now contributes to drainage Node C for post-development. Drainage Node D will remain the same. The attenuation pond was constructed upstream from Node C and will ensure that the pre-development peak flow rate at Node D remains the same for post-development peak flow rate. It can be therefore concluded that the runoff calculations for the existing attenuation pond are still relevant due to the fact that Erf 6 and Erf 7 was assumed to be hardened areas in the post-development scenario as indicated in Figure 3 above. It can also be confirmed that all foreseen upstream possible future development has been allowed for.

The conclusion of the specialist investigation recommended the increased developable area of Erf 7 and allow for a 5m buffer zone next to the natural stream. The increase hardened developable area of Erf 7 will have an impact on the downstream stormwater infrastructure and the ecological environment of the stream the impact thereof must be determined by a detail design which is not part of the scope of this report. The use of so called “green stormwater infrastructure” is recommended to mitigate the impact of the additional hardened area of Erf 7 on the natural stream. It is proposed that stepped (due to the slope of the site) attenuation structures, which aid infiltration, is constructed and that the outflow from the ponds be further be retarded by the use of berms or eco-logs (Figure 6) in order to aid the wetting of the embankment and avoid erosion. The purpose of these attenuations structures is to attenuate the post-development stormwater runoff due to the hardening of the additional developable area of Erf 7 as well as to maximize the possible infiltration of stormwater into the soil. The number and size of the structures must be determined by a competent civil engineer in a detail design process.

The use of green stormwater infrastructure will reduce the impact on both the downstream stormwater infrastructure and ecological environment of the stream due to the increased developable area of Erf 7. The use of green stormwater structures will attenuate the additional post-development runoff of Erf 7. The use of eco-logs and swales will prevent soil erosion and will aid wetting of the stream’s embankment. The design of the existing attenuation pond has been reviewed and it is found that the actual development which has occurred since the construction of the attenuation pond is within the assumptions made during the design of the attenuation pond. Additionally, it is confirmed that the design of the attenuation pond has made allowance for the hardening of the entire erf 7 area and that the design has included all foreseen future development upstream of the pond.





**FIGURE 8: PROPOSED GREEN STORMWATER ATTENUATION POND AND OUTLET STRUCTURE**



**FIGURE 9: ECO-LOGS FOR THE PROTECTION OF SOIL EROSION**



## 5. ALTERNATIVES

The only alternative to be investigated, associated with the amendment of the Environmental Authorisation for the proposed subdivision, consolidation, and rezoning of the property, is the No-Go Alternative.

The No-Go Alternative would assume that the current division of Erf 6 and 7 of Orchards View Extension 1 will remain as is, with the current zoning of the property noted as Public Open Space and Special as noted in Figure 10 below.

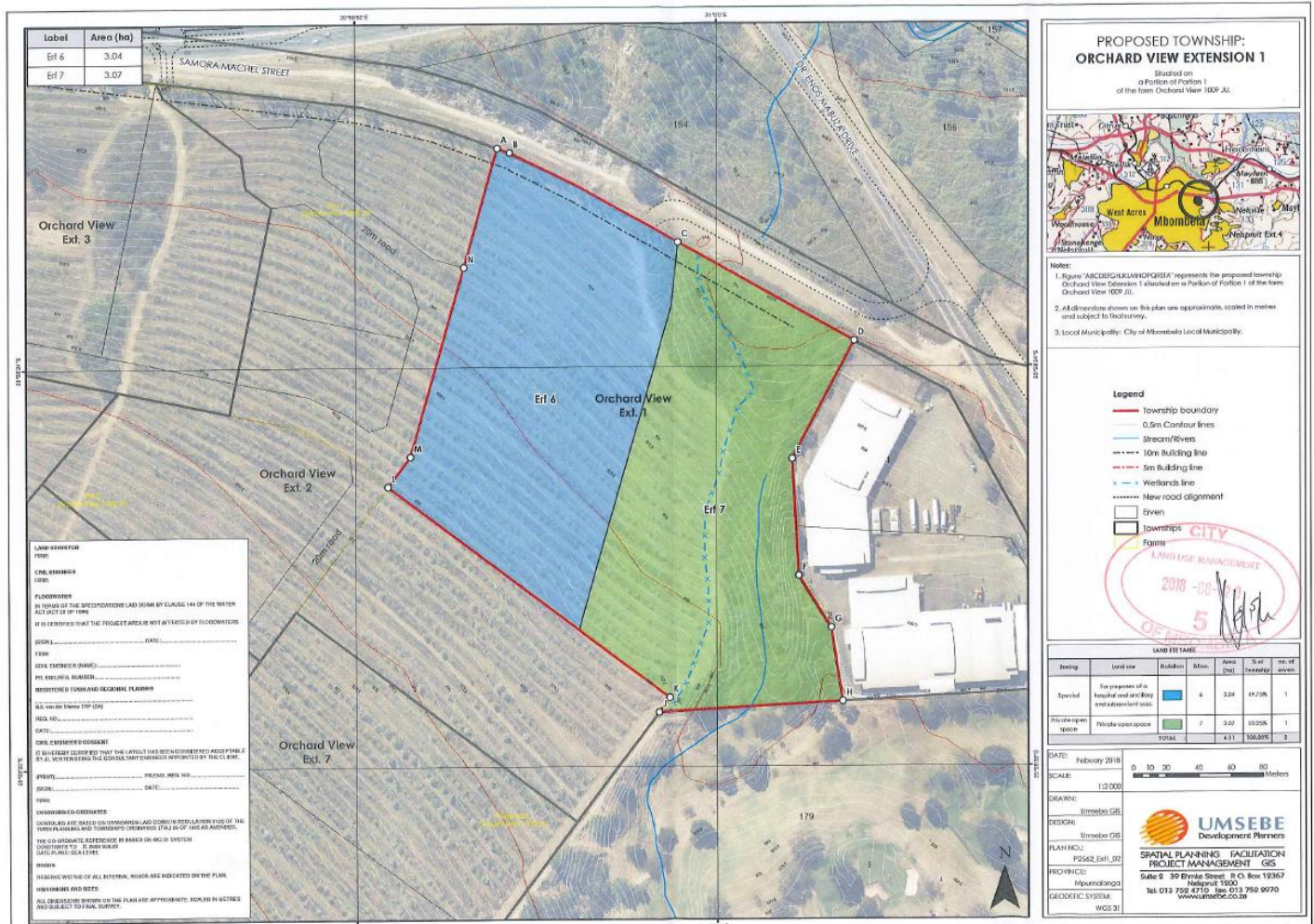


FIGURE 10: PREVIOUSLY APPROVED LAYOUT OF ORCHARDS VIEW EXTENSION 1

## 6. METHODOLOGY OF ASSESSING THE SIGNIFICANCE OF IMPACTS

This section outlines the method used for assessing the significance of the potential environmental impacts associated with the proposed amendment.

For each impact, the **EXTENT** (spatial scale), **MAGNITUDE** and **DURATION** (time scale) would be described, as shown in **Table 5**. These criteria are then used to determine the **SIGNIFICANCE** of the impact, firstly in the case of no mitigation and then with the most effective mitigation measure(s) in place. The mitigation described in the Report represents the full range of plausible and pragmatic measures but does not necessarily imply that they would be implemented.

The following tables show the scale used to assess these variables and defines each of the rating categories.

**TABLE 5: ASSESSMENT CRITERIA FOR THE EVALUATION OF IMPACTS**

Criteria	Category	Description
Extent or spatial influence of impact	<b>Regional</b>	Beyond a 30km radius of the candidate site.
	<b>Local</b>	Within a 30km radius of the candidate site.
	<b>Site-specific</b>	On site or within 100 m of the candidate site.
Magnitude of impact (at the indicated spatial scale)	<b>High</b>	Natural and/ or social functions and/ or processes are <i>severely</i> altered
	<b>Medium</b>	Natural and/ or social functions and/ or processes are <i>notably</i> altered
	<b>Low</b>	Natural and/ or social functions and/ or processes are <i>slightly</i> altered
	<b>Very low</b>	Natural and/ or social functions and/ or processes are <i>negligibly</i> altered
	<b>Zero</b>	Natural and/ or social functions and/ or processes remain <i>unaltered</i>
Duration of impact	<b>Long-term</b>	More than 10 years after construction
	<b>Medium-term</b>	Up to 5 years after construction
	<b>Construction-term</b>	Up to 3 years

The **SIGNIFICANCE** of an impact is derived by taking into account magnitude, duration and extent of each impact. The criteria employed in arriving at the different significance ratings is shown in Table 6.

**TABLE 6: DEFINITION OF SIGNIFICANCE RATINGS**

Significance ratings	Level of criteria required
High	<ul style="list-style-type: none"> <li>High magnitude with a regional extent and long-term duration</li> <li>High magnitude with either a regional extent and medium-term duration or a local extent and long-term duration</li> <li>Medium magnitude with a regional extent and long-term duration</li> </ul>
Medium	<ul style="list-style-type: none"> <li>High magnitude with a local extent and medium-term duration</li> <li>High magnitude with a regional extent and construction period or a site-specific extent and long-term duration</li> <li>High magnitude with either a local extent and construction period duration or a site-specific extent and medium-term duration</li> <li>Medium magnitude with any combination of extent and duration except site specific and construction period or regional and long term</li> <li>Low magnitude with a regional extent and long-term duration</li> </ul>
Low	<ul style="list-style-type: none"> <li>High magnitude with a site-specific extent and construction period duration</li> <li>Medium magnitude with a site-specific extent and construction period duration</li> <li>Low magnitude with any combination of extent and duration except site specific and construction period or regional and long term</li> <li>Very low magnitude with a regional extent and long-term duration</li> </ul>
Very low	<ul style="list-style-type: none"> <li>Low magnitude with a site-specific extent and construction period duration</li> <li>Very low magnitude with any combination of extent and duration except regional and long term</li> </ul>
Neutral	<ul style="list-style-type: none"> <li>Zero magnitude with any combination of extent and duration</li> </ul>

Once the significance of an impact has been determined, the **PROBABILITY** and **CONFIDENCE** of this impact are determined using the rating systems outlined in **Table 7** and **Table 8**. The significance of an impact should always be considered in concert with the probability of that impact occurring. Lastly, the **REVERSIBILITY** of the impact is estimated using the rating system outlined in **Table 9**.

**TABLE 7: DEFINITION OF PROBABILITY RATINGS**

Probability ratings	Criteria
Definite	Estimated greater than 95 % chance of the impact occurring.
Probable	Estimated 5 to 95 % chance of the impact occurring.
Unlikely	Estimated less than 5 % chance of the impact occurring.

**TABLE 8: DEFINITION OF CONFIDENCE RATINGS**

Confidence ratings	Criteria
Certain	Wealth of information on and sound understanding of the environmental factors potentially influencing the impact.
Sure	Reasonable amount of useful information on and relatively sound understanding of the environmental factors potentially influencing the impact.
Unsure	Limited useful information on and understanding of the environmental factors potentially influencing this impact.

**TABLE 9: DEFINITION OF REVERSIBILITY RATINGS**

Reversibility ratings	Criteria
<b>Irreversible</b>	The activity will lead to an impact that is in all practical terms permanent.
<b>Reversible</b>	The impact is reversible within 2 years after the cause of the impact is removed.

## 7. ENVIRONMENTAL IMPACT ASSESSMENT

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Decreasing the Open Space area of Orchards View Extension 1 could have significant impacts on the adjacent riparian area and watercourse if proper mitigation measures are not implemented. As the construction impacts have already been assessed and approved, the proposed changes could result to changes during the operational phase. For this reason, the changes to the impacts during the operational phase are assessed below.

### 7.1 Changes to the impacts during the operational phase

The proposed changes could likely result to the to the following changes in environmental and socio-economic impacts:

- Impact on the wetland and riparian habitat
- Flooding
- Socio-Economic Impact

#### 7.1.1. Impact on Wetland and Riparian Habitat

##### Description of the potential impact

According to the proposed layout plan the development land will encroach into the northern part of the wetland. This would result in the direct loss of the riparian forest and the diversion of flow in the wetland. The development would result in the hardening of the catchment surface feeding the wetland. This would reduce the amount of sub-surface water flow feeding these wetlands and result in the drying of these wetlands.

##### Impact Assessment

This investigation found that the riparian forest (however relatively small) serves an important function in stabilizing the wetland and providing erosion control functions. The outer margin of the riparian zone is severely infested by alien invasive vegetation. However, the space beneath the fragmented riparian forest is clear of alien vegetation and covered with an organic layer of dead leaves. This is a clear indication that any disturbance to the riparian forest is not recommendable. It is evident that surface water run-off flows across the forest floor without any signs of erosion, this is further indication on the important function the forest provided by stabilizing the geomorphology of the wetland. The disturbance to the wetland area would therefore result in a notable change in natural functions and processes and therefore the impact is of medium magnitude. The impact will be permanent and is therefore of long-term duration, and of local extent. The impact on the wetland and riparian habitat is therefore of medium significance prior to the implantation of mitigation measures.



**TABLE 10: IMPACT ON WETLAND AND RIPARIAN HABITAT**

IMPACT	BEFORE MITIGATION					AFTER MITIGATION
	Magnitude	Extent	Duration	Probability	Impact Rating	Impact Rating
Wetland and Riparian Habitat <b>[NEGATIVE]</b>	<b>Medium</b>	<b>Local</b>	<b>Long-term</b>	<b>Probable</b>	<b>Medium</b>	<b>Low</b>

### Mitigation

- To ensure that the wetland / riparian zone is not directly affected, the layout plan must be amended to ensure that the buffer line forms the outside edge of development land.
- The calculated buffer zone of 10m must be cordoned off before any development activities are commenced with. The 10m buffer line will form the absolute line beyond which no activities are allowed with exception of management activities included with the EMP.
- During site preparation all spoil material must be pushed into the opposite direction of the buffer line from where it must be disposed of.
- Storm water mitigation must be designed and implemented as per the green engineering methods proposed by the civil engineer.
- The sandy soil is highly susceptible to erosion, during construction efficient measures must be provided to prevent and manage this impact.
- During the operational phase potential soil erosion must be monitored and addressed.
- The wetland / riparian zone is severely infested with alien invasive vegetation. This impact must be managed by the owner.
- Additional riparian trees must be planted in the riparian zone to redress the historic loss of indigenous vegetation and to improve the ecological importance of this zone. A specialist must be appointed to assist with this task.
- The wetland / riparian zone has the potential to be add value to the larger development land if it is well managed and may be used as place of recreation by the residents.
- If any of these conditions and mitigation measures are to be successful ownership and responsibility of this parcel of land must be clearly defined in the EMP and has to be transferred to any future owners.

## 7.2.2. Impact of Storm Water / Flooding

### Description of the potential impact

The narrowing and diversion of the wetland would reduce its ability to control erosion, and attenuate flooding and control stream flow, functions which become more important with the hardening of the surrounding catchments. The hardening of the surfaces will therefore result to increased stormwater flow, affecting the adjacent watercourse as increased flow of water increases the possibility of erosion and sedimentation.

In addition to this, the culvert sizes and structures were designed to only accommodate a certain volume of water within a given time period. If the velocity of water increases and more water flows to the watercourse within a given time period, the culvert sizes might not be able to accommodate the amount of water and flooding of the area might occur. For this reason, a Hydrological Assessment / Storm Water Report was undertaken by Endecon Ubuntu, to determine whether the existing storm water infrastructure and attenuation pond, will be able to accommodate the increased stormwater flow.

Following the assessment undertaken by Endecon Ubuntu, it was determined that the existing attenuation pond was designed, taking into account the increased hardening of Erf 7 of Orchards Extension 1 and therefore the existing structures are able to accommodate the increased stormwater flow caused by the extension of the developable area of Erf 7. Green infrastructure is however recommended to reduce the velocity of water before it reaches the watercourse.

### Impact Assessment

As the Storm Water Report indicated, the existing attenuation pond was constructed with the intention of Erf 7 being hardened and therefore being able to accommodate the increased storm water flow. Without the implementation of mitigation measures, the magnitude of the impact is therefore low, having a local extent and long-term duration. The impact is therefore assessed to be of low significance prior to the implementation of mitigation measures. Mitigation measures are however required to be implemented to further reduce the impact of increased storm water flow, as cumulatively, over a period of a few years, the significance of the impact might increase.

**TABLE 11: IMPACT OF STORM WATER / FLOODING**

IMPACT	BEFORE MITIGATION					AFTER MITIGATION
	Magnitude	Extent	Duration	Probability	Impact Rating	Impact Rating
Increased storm water / flooding <b>[NEGATIVE]</b>	Low	Local	Long-term	Probable	Low	Very Low

### Mitigation measures

Green storm water infrastructure is recommended to further reduce velocity of storm water flow to the adjacent watercourse. This green infrastructure must therefore be included as a condition if the amendment of the Environmental Authorisation is considered by the DARDLEA and detailed designs of these infrastructure must be submitted to the DARDLEA for approval prior to commencement of any construction activities on this portion of the property.

### 7.2.3. Socio-Economic Impact

#### Description of the environment

The client, Busamed, purchased the property with the intention of constructing the Busamed Acute Hospital on these premises. Clearance activities for the purposes of construction commenced on the property and for a number of reasons, the construction was halted, and a decision was made to sell the property to another prospective developer. Throughout the process, a number of expenses incurred and in order to mitigate the financial loss, the client is proposing to increase the developable area of the property, to increase the value of the property.

From a socio-economic perspective, the proposed change will only have an impact on the client, Busamed, and not any other surrounding community members. The socio-economic impact of the entire Orchards View Development was assessed during the initial Environmental Authorisation Application phase and not change is expected in this regard.

#### Impact Assessment

If the DARDLEA approves the subdivision, consolidation and rezoning of the property, the client will have retrieved the money expended for the purchasing of the property and other expenses incurred during the commencement of the construction process which was halted. The socio-economic impact on the client if the property is subdivided, consolidated and rezoned, would therefore be positive. However, as the client would only retrieve the money expended for the property, the magnitude of the impact is zero and for this reason the impact is of neutral significance.

**TABLE 12: SOCIO-ECONOMIC IMPACT IF EA AMENDMENT IS APPROVED**

IMPACT	BEFORE MITIGATION					AFTER MITIGATION
	Magnitude	Extent	Duration	Probability	Impact Rating	Impact Rating
Socio-economic [POSITIVE]	Zero	Regional	Medium	Sure	Neutral	Neutral

As for the No-Go Alternative, the impact on the client would be negative as the client will not be able to retrieve the expenses incurred on the property and this will result to a financial loss. The property

will also have to be sold as per the approved layout in 2018, thereby reducing the likelihood of the property being sold. Therefore, if the DARDLEA does not approve the subdivision, consolidation and rezoning of the property, the magnitude of the financial impact on the client would be medium, of regional extent and medium-term duration. If the amendment is not approved, no other mitigation measures can be recommended to reduce the impact.

**TABLE 13: SOCIO-ECONOMIC IMPACT IF EA AMENDMENT IS NOT APPROVED**

IMPACT	BEFORE MITIGATION					AFTER MITIGATION
	Magnitude	Extent	Duration	Probability	Impact Rating	Impact Rating
Socio-economic <b>[NEGATIVE]</b>	<b>Medium</b>	<b>Regional</b>	<b>Medium</b>	<b>Sure</b>	<b>Medium</b>	<b>Medium</b>



## 7.3 Environmental Impact Statement

The table below summarises the changes in impacts identified and assessed for the proposed amendment of the Environmental Authorisation:

**TABLE 15: ENVIRONMENTAL IMPACT STATEMENT**

IMPACT	SIGNIFICANCE BEFORE MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION MEASURES
<b>Operational Phase Impacts</b>		
Impact on Wetland and Riparian Habitat	Low	Very Low
Stormwater impacts / Flooding	Medium	Low
Socio-Economic Impact if EA amendment is approved	Neutral	Neutral
Socio-Economic Impact if EA Amendment is not approved	Medium	Medium

## 8. CONCLUSION AND WAY FORWARD

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### 8.1 Assumptions and Limitations

In undertaking this investigation and compiling the Draft EA Amendment Report, the following has been assumed:

- The information provided by the proponent and respective specialists are accurate and unbiased, and no information that could change the outcome of the Environmental Authorisation Amendment process has been withheld.
- The scope of this investigation is limited to assessing the additional environmental impacts associated with the rezoning, subdivision and consolidation of the property.
- The conclusion and recommendations proposed are based solely on the information, scope of works as agreed with the proponent.

### 8.2 Conclusion and Recommendations

The essence of all environmental assessment processes is aimed at ensuring informed decision-making and environmental accountability. Furthermore, it assists in achieving environmentally sound and sustainable development. The impact assessment for this project has been undertaken in line with the requirements prescribed in the NEMA regulations.

The assessment of the impacts associated with the proposed amendment, concluded that the impact of additional storm water flow and impact on the adjacent wetland area is of **low significance** if mitigation measures are implemented as a condition of the Amended Environmental Authorisation.

The conclusions and recommendations of the assessment notes the following:

- According to the Wetland Assessment undertaken, the existing Public Open Space area, can be converted to development area if a 10m wetland buffer is adhered to.
- Green infrastructure must be implemented outside the 10m wetland buffer to reduce the flow of storm water on site before it enters the adjacent watercourse. Eco-logs must also be used to ensure further reduction of the velocity of the storm water before it enters the watercourse.
- The implementation of the 10m buffer and additional 5m for the green stormwater infrastructure will result to the developable area being increased to 41 274m<sup>2</sup>, thereby increasing the developable area with 10 924m<sup>2</sup>.

These measures have been added to the already approved Environmental Management Plan and is included within Appendix E.

The significance of the potential environmental (biophysical and social) impacts associated with the proposed project are discussed in detail under **Section 7**.

It is the opinion of the EAP that the amendment of the EA be granted, and the proposed mitigation included as the conditions of the authorisation.

## 8.2 Way Forward

The next steps for the EA Amendment process will be to distribute the Draft EA Amendment Report and make it available to the public (including the registered I&APs) and Organs of State for a period of 30 days, during which the Competent Authority (DARDLEA) will also be given the opportunity to provide comments on the report. After the 30-day comment period, all comments will be addressed by the EAP and incorporated within the Final EA Amendment Report to be submitted to the DARDLEA for decision making. All registered I&APs will be notified of the decision and will be given an opportunity to appeal as per the NEMA requirements.

## 9. REFERENCES

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*National Environmental Management Act 107 of 1998 (NEMA 107, 1998)*

*General Notice Regulation 982, 983, 984 and 985 of 2014 (as amended in 2017)*

*Mpumalanga Biodiversity Conservation Plan, 2014*

*Endecon Ubuntu, Stormwater Proposal Report for Orchards View Extension 1, April 2023*

*Afrika Enviro Biology, Wetland Assessment for Orchards View Extension 1, May 2023.*