



WATER USE LICENCE APPLICATION TECHNICAL REPORT

THE PROPOSED DEVELOPMENT OF ERF 1327 AND 1328,
STRUBENSVALLEI EXT 24, CITY OF JOHANNESBURG

Comment Period: 1 December 2021 – 1 February 2021

Proponent:

Renico Construction (Pty) Ltd.

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TABLE OF CONTENTS

1	INTRODUCTION.....	1
1.1	OVERVIEW	1
1.2	PROJECT LOCATION.....	2
1.3	CONTACT DETAILS	3
2	DETAILS OF ASSESSOR AND SPECIALISTS.....	4
3	REPORT OUTLINE AND REQUIREMENTS.....	5
4	LEGAL FRAMEWORK	5
4.1	NATIONAL ENVIRONMENTAL MANAGEMENT ACT (NEMA) (ACT NO 107 OF 1998).....	5
4.2	NATIONAL WATER ACT (NWA) (ACT NO. 36 OF 1998)	6
5	WATER USES	8
5.1	WATER USE AUTHORISATION PROCESS	8
5.2	SPECIALIST ASSESSMENTS.....	10
5.3	GAPS AND ASSUMPTIONS	10
5.4	DESCRIPTION OF WATER USE ACTIVITIES	11
5.5	WATER USES.....	17
6	PROFILE OF THE RECEIVING ENVIRONMENT	21
6.2	SURFACE WATER.....	22
6.3	HYDROPEDOLOGY.....	25
6.4	SOCIO-ECONOMIC ENVIRONMENT	30
7	ALTERNATIVES ASSESSED AS PART OF THE BAR	1
8	ENVIRONMENTAL IMPACT STATEMENT.....	3
9	PUBLIC PARTICIPATION.....	11
10	CONCLUSION AND RECOMMENDED CONDITIONS FOR INCLUSION IN THE WUL	12
11	ANNEXURES	14
11.1	CURRICULUM VITAE OF ASSESSOR AND SPECIALISTS	15
11.2	PROCEDURAL REQUIREMENTS.....	16
11.3	SPECIALIST STUDIES	20
11.4	MAPPING	23
11.5	MASTERPLAN	24
11.6	SITE PHOTOGRAPHS.....	25
11.7	PUBLIC PARTICIPATION REPORT	26

11.8	ENVIRONMENTAL MANAGEMENT PROGRAMME.....	27
11.9	REHABILITATION PLAN.....	28
11.10	MONITORING PLAN	29
11.11	CONSTRUCTION METHODOLOGY/METHOD STATEMENT	30
11.12	CONSTRUCTION MANAGEMENT PLAN	31
11.13	CIVIL REPORTS AND DESIGNS	32
11.14	SECTION 27 MOTIVATION.....	33
11.15	STORMWATER REPORT	34
11.16	BASIC ASSESSMENT REPORT	35
11.17	RISK MATRIX	36

LIST OF FIGURES

FIGURE 1-1: LOCALITY MAP.....	1
FIGURE 1-2: AERIAL LOCALITY MAP.....	2
FIGURE 5-1: WATER USE AUTHORISATION PROCESS.....	9
FIGURE 5-2: EXTERNAL WATER CONNECTION.....	13
FIGURE 5-3: SEWER LAYOUT.....	14
FIGURE 5-4: INTERNAL STORMWATER AND STORMWATER ATTENUATION.....	15
FIGURE 5-5: ACCESS ROAD.....	16
FIGURE 5-6: WATER USES.....	19
FIGURE 6-1: MINIMUM, MAXIMUM AND AVERAGE TEMPERATURES FOR WITPOORTJIE, GAUTENG (WWW.WORLDWEATHERONLINE.CO.ZA).....	21
FIGURE 6-2: RAIN AMOUNT AND RAIN DAYS FOR WITPOORTJIE, GAUTENG (WWW.WORLDWEATHERONLINE.CO.ZA).....	22
FIGURE 6-3: NATIONAL WETLAND MAP VERSION 5 (NWM5) (VAN DEVENTER <i>ET AL.</i> , 2019) (FROM PRISM EMS, 2020).....	23
FIGURE 6-4: WETLAND AND WETLAND BUFFER ZONES (PRISM EMS, 2020).....	25
FIGURE 6-5: SOIL FORM DISTRIBUTION WITH INSERT OF CONCEPTUAL HYDROLOGICAL RESPONSE (TOP LEFT).....	28
FIGURE 6-6: CONCEPTUAL HYDROLOGICAL RESPONSE MAP WITH INSERT OF SOIL DISTRIBUTION MAP (TOP LEFT.....	29
FIGURE 6-7: HIGHEST EDUCATION LEVEL (ALL AGES) (STATS SA, 2017).....	30
FIGURE 6-8: EMPLOYMENT FOR THOSE AGED 15-64 (STATS SA, 2017).....	31
FIGURE 7-1: PROPOSAL.....	1
FIGURE 7-2: ALTERNATIVE 1.....	2

LIST OF TABLES

TABLE 1-1.: DETAILS OF THE APPLICANT.....	3
TABLE 2-1.: DETAILS OF THE ASSESSOR.....	4
TABLE 5-1: DETAILS OF PLANNED DEVELOPMENT.....	11
TABLE 5-2: DETAILS OF THE WATER USES BEING APPLIED FOR.....	20
TABLE 8-1: RISK MATRIX SUMMARY.....	8

1 INTRODUCTION

1.1 Overview

The proposed Strubensvallei Ext. 24 will involve the development of Erf 1327 and Erf 1328. The following rights are applicable to Erf 1327:

- Zoning: Residential 3
- Site Area: 1.9724 ha
- Height 3 Storeys (with council consent)
- Coverage 40%
- Floor Area Ratio (FAR) 0.4
- Density 40 units per hectare
- Number of units 72 units
- Number of Parking Bays: 166 parking bays
- Refuse Area Details 41 m²

Erf 1328 will not be developed but will remain public open space.

The site is affected by the future Metro Boulevard planned by the Johannesburg Roads Agency which is excluded from the project footprint. Necessary access, internal roads and services will also be put in place as follows:

- Water Services - A new 110 mm diameter mPVC pipe (SANS 1283) will be put in place within the new access road and will connect to this existing pipe. The length of this connection is approximately 180m.
- Sewer Services - A new 160mm-diameter uPVC CL 400 H/D pipe will connect into the existing sewer system by means of a new manhole. This new connection pipeline is approximately 51m in length.
- Stormwater services - An internal stormwater reticulation system will be put in place and will utilize 160mm and 300mm pipes to direct stormwater to 300mm and 375mm OGEE pipe which will run down the eastern side of the development and lead to a stormwater attenuation pond which will be approximately 231 m² in extent. From there, a 450mm OGEE pipe will discharge water under the proposed Metro boulevard into Erf 1348. The length of this pipe is approximately 79m.
- Access - The site access will be provided from the cul-de-sac intersecting with Fiddle Avenue. As part of the development, this new cul-de-sac and new section of surfaced road extending to the existing Fiddle Avenue road surface will be constructed to council standards and handed over to council upon completion and acceptance of the road infrastructure. This road will include one inbound lane with a minimum width of 3.0m and one outbound lane with a minimum width 4.5m. A 2m paved sidewalk along the northern side of the cul-de-sac will also be provided.

It should be noted that whilst the development includes both Erf 1327 and 1328, the development footprint is limited to Erf 1327 as Erf 1328 will remain as public open space and will not be developed.

Further, please note: a townplanning application has been submitted to the City of Johannesburg and the layout plan approved in 2011. Conditions of establishment were subsequently provided on 16 September 2011 and the township proclaimed on 11 March 2014.

In addition, an Environmental Authorisation process was undertaken in 2011 and was subsequently approved by the Gauteng Department of Agriculture and Rural Development (GDARD) on 15 December 2011 (GAUT:006/11-12/E0075). Whilst this EA has since lapsed, this current assessment (including new specialist studies) has determined that impacts related to the development can be satisfactorily mitigated as such this Basic Assessment Report / Water Use Licence Application (WULA) recommends the project be approved. A is also being undertaken and

1.2 Project Location

The proposed development is located on Erf 1327 and Erf 1328 of Strubensvallei Ext 24, in Region C of City of Johannesburg. The centre coordinates of the site are as follows:

- 26° 7'5.59"S; and
- 27°54'43.29"E

Figure 1-1 and **Figure 1-2** provide the locality and aerial locality map.

The study site is located in quaternary catchment A21E in the Limpopo Water Management Area (WMA 1).

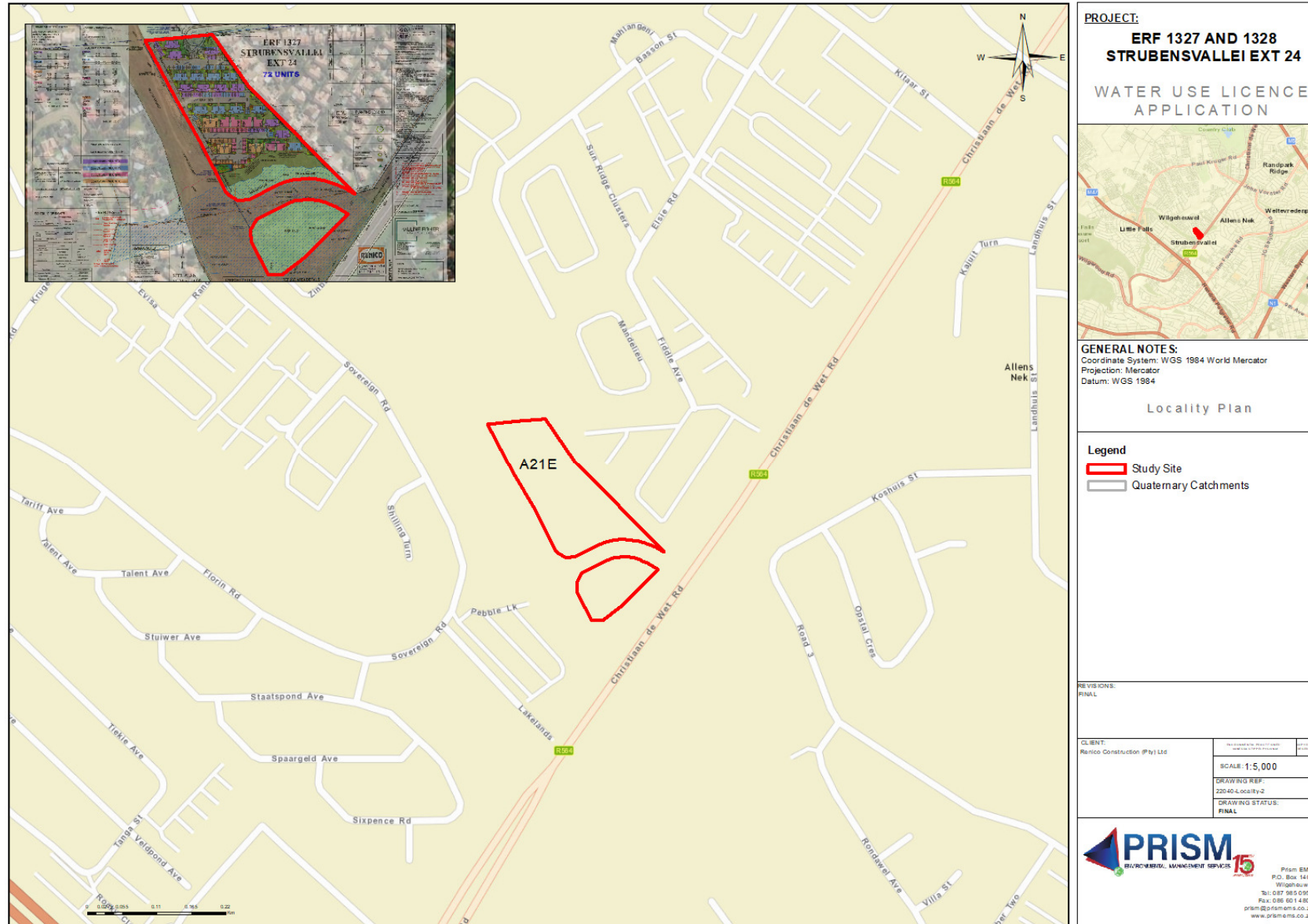


Figure 1-1: Locality Map

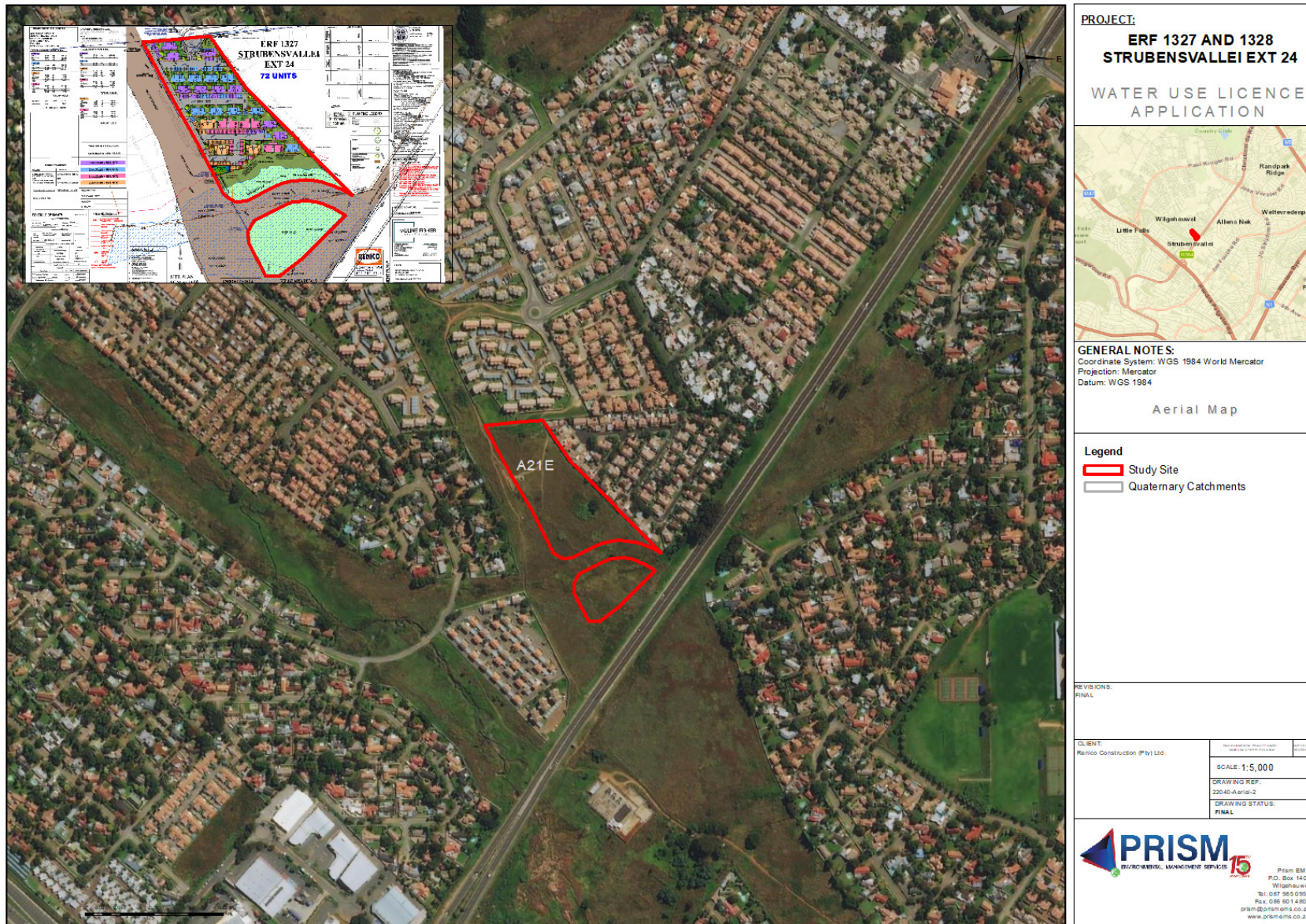


Figure 1-2: Aerial Locality Map

1.3 Contact Details

The applicant is the entity that will assume responsibilities as the holder of the WUL if granted. Details of the applicant is contained in Table 1-1.

Table 1-1.: Details of the Applicant.

Applicant:	Renico Construction (Pty) Ltd
Contact Person:	Nico Louw

2 DETAILS OF ASSESSOR AND SPECIALISTS

Prism EMS have been appointed to undertake the required Water Use Authorisation Process in terms of the Section 21 of the National Water Act (Act No. 36 of 1998) (NWA) for the aforementioned project. Details of the Environmental Assessment Practitioner are provided in Table 2-1 and the relevant Curriculum Vitae are appended in Annexure 11.1.

Table 2-1.: Details of the Assessor

Assessor:	Vanessa Stippel
Company:	Prism Environmental Management Services
Qualifications:	MSc. Ecology, Environment and Conservation
Experience:	10 years
Affiliation/ Registration	Professional Member of Southern African Institute of Ecologists and Environmental Scientists SACNASP Pr.Sci.Nat. (116221) Registered EAP (2019/175)
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Designation	Name	Qualification	Professional Registration	Specialist Assessment
Prism EMS Team				
Contact Details	Post: PO Box 1401, Wilgeheuwel, Johannesburg, 1736		Tel: 087 985 0951 Fax: 086 601 4800 Email: prism@prismems.co.za www.prismems.co.za	
Project Director	De Wet Botha	MA. Environmental Management (PHED) 18 years' experience	South African Council for Natural Scientific Professions (SACNASP) registered Scientist Pr.Sci.Nat. (119979) Registered Member of Environmental Assessment Practitioners Association of South Africa (EAPASA)(2019/1209) Member of the International Association for Impact Assessors (IAIAsa) (1653) Member of the Gauteng Wetland Forum Member of the South African Wetland Society	Project Management, Wetland and Hydropedologica l Assessment
Aquatic Specialist	Prasheen Singh	MSc Aquatic Health (Cum Laude) 10 Years' Experience	Pr. Sci. Nat. (116822)	Monitoring and Rehabilitation Plan
Hydropedologist	M Tinnfeld	M.Sc. Soil Science 10 Years' Experience	Pr. Sci. Nat. (114087) SASSO (851) WSSA (PVXVTM4L) GSSA EGU (388469)	Specialist Hydropedologist

3 REPORT OUTLINE AND REQUIREMENTS

On the 24 March 2017, the Regulations regarding the Procedural Requirements for Water Use License Applications and Appeals (R. 267 of 24 March 2017) were published and came into effect. These Regulations define the Water Use Licence Application Technical Report as follows:

“Water use Licence Application Technical Report includes water use registration forms, public participation material and specialist studies.”

This report aims to provide all the necessary information related to the water uses detailed in the various water use licence forms. In addition, the appendices of this report include all the necessary additional information required for the processing of this application. A checklist has been provided as part of the Executive Summary and is aligned to the checklists contained in the R.267 of 24 March 2017.

4 LEGAL FRAMEWORK

4.1 National Environmental Management Act (NEMA) (Act No 107 of 1998)

The NEMA is the umbrella framework for all environmental legislation primarily to assist with implementing the environmental rights of the Constitution. The NEMA provides fundamental principles required for environmental decision making and to achieve sustainable development. It also makes provision for duty of care to prevent, control and rehabilitate the effects of significant pollution and environmental degradation, and prosecute environmental crimes. These principles must be adhered to and taken into consideration during the impact assessment phase.

NEMA defines “environment” as –

“the surroundings within which humans exist and that are made up of –

- (i) the land, water and atmosphere of the earth;*
- (ii) micro-organisms, plants and animal life;*
- (iii) any part or combination of (i) or (ii) and the interrelationship among and between them; and*
- (iv) the physical, chemical, aesthetic and cultural, properties and conditions of the foregoing that influence human health and well-being.”*

Section 24D and 24(2) of the NEMA makes provision for the publication of list and associated regulations containing activities identified that may not commence without obtaining prior environmental authorisation from the competent authority. These regulations are referred to as the EIA Regulations and are interpreted hand in hand with the various listed activities discussed further below.

4.1.1 Environmental Impact Assessment Regulations, 2014 (GN R 982 of 4 December 2014)

The EIA regulations were promulgated in terms of Section 24 of the NEMA, for the purpose of providing methodologies and specific requirements for the undertaking of an EIA. The Regulations stipulate that any proposed activity listed in the associated notices must undertake either a Basic Assessment (BA) or Scoping & Environmental Impact Report (S&EIR) in order to obtain an environmental authorisation (if granted by the competent authority) before the commencement of the specified listed activity. The EIA Regulations provide the minimum requirements for appointing an EAP and for undertaking the relevant Public Participation Process (PPP) as required. They also detail the contents of the impact assessment reports and all other aspects associated with BA and/or EIAs.

An Environmental Authorisation process is being undertaken together with the WULA. A copy of the Basic Assessment Report (BAR) is included in **Annexure 10.16**.

4.2 National Water Act (NWA) (Act No. 36 of 1998)

The purpose of the NWA is to ensure that the nation's water resources are protected, used, developed, conserved, managed and controlled in ways which consider amongst other factors:

- Meeting the basic human needs of present and future generations;
- Promoting equitable access to water;
- Redressing the results of past racial and gender discrimination;
- Promoting the efficient, sustainable and beneficial use of water in the public interest;
- Facilitating social and economic development;
- Providing for growing demand for water use; protecting aquatic and associated ecosystems and their biological diversity;
- Reducing and preventing pollution and degradation of water resources;
- Meeting international obligations;
- Promoting dam safety; and
- Managing flooding and droughts.

Part 1 of Chapter 4 (Use of Water) of the NWA sets out general principles for regulating water use. In general, a water use must be licensed unless it is listed in Schedule I, is an Existing Lawful Use, is permissible under a General Authorisation, or if a responsible authority waives the need for a licence. The Minister may limit the amount of water which a responsible authority may allocate. In making regulations the Minister may differentiate between different water resources, classes of water resources.

Section 21 of the NWA lists water uses that must be licensed and includes:

- Section 21(a): taking water from a water resource
- Section 21(b): storing water
- Section 21(c): impeding or diverting the flow of water in a watercourse
- Section 21(d): engaging in a stream flow reduction activity contemplated in section 36

- Section 21(e): engaging in a controlled activity as identified in Section 37 (1) or declared under Section 38 (1).
- Section 21(f): discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall, or other conduit.
- Section 21(g): disposal of waste (i.e. effluent from sewage works) in a manner which may detrimentally impact on a water resource;
- Section 21(h): disposing in any manner of water which contains waste from, or which has been heated in, any industrial or power generation process.
- Section 21(i): altering the bed, banks, course or characteristics of a watercourse.
- Section 21(j): removing, discharging, or disposing of water found underground if it necessary for the efficient continuation of an activity or for the safety of people.
- Section 21(k): using water for recreational purposes.

Applicable definitions included in the NWA include watercourse which is defined as “(a) a river or spring; (b) a natural channel in which water flows regularly or intermittently; (c) a wetland, lake or dam into which, or from which, water flows; and (d) any collection of water which the Minister may, by notice in the Gazette, declare to be a watercourse (and a reference to a watercourse includes, where relevant, its bed and banks). The Act also defines a wetland as “land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil”.

The recently published General Authorisation in terms of Section 39 of the NWA for water uses as defined in Section 21(c) or Section 21(i) (GN 509 of 2016) also defines the regulated area of a watercourse as meaning: (a) *The outer edge of the 1 in 100 year flood line and /or delineated riparian habitat, whichever is the greatest distance, measured from the middle of the watercourse of a river, spring, natural channel, lake or dam;* (b) *In the absence of a determined 1 in 100 year flood line or riparian area the area within 100m from the edge of a watercourse where the edge of the watercourse is the first identifiable annual bank fill flood bench (subject to compliance to section 144 of the Act); or (c) A 500 m radius from the delineated boundary (extent) of any wetland or pan.*

Therefore, the following listed water uses that require a Water Use License according to Section 21 of the NWA are triggered for the proposed development:

- Section 21(c): impeding or diverting the flow of water in a watercourse
- Section 21(i): altering the bed, banks, course or characteristics of a watercourse.

It should be noted that on the 24 March 2017, the Regulations regarding the Procedural Requirements for Water Use License Applications and Appeals (R. 267 of 24 March 2017) were published and came into effect. These Regulations provide the requirements for the WULA process. This WULA has been compiled in line with these requirements.

5 WATER USES

5.1 Water Use Authorisation Process

The Water Use Authorisation process followed for the proposed development is indicated in Figure 5-1. The following sections provide an overview of the process as it has been undertaken.

5.1.1 Pre-Application Enquiry Meeting and Submission of Application (DW755)

A Pre-Application Enquiry will be submitted online on the EWULAAS System of the Department of Water and Sanitation (DWS) and thereafter, a pre-application meeting was then undertaken to confirm the process and to provide the case office with the details of the proposed development.

5.1.2 Site Inspection and Confirmation of Information Requirements

As required by the Procedures, once the Department confirmed a WUL process is required, Phase 1 of the EWULAAS system will be opened. Once the forms and additional information has been compiled, it will be submitted. The department will then confirm whether a site visit is required and if necessary, the site visit will be scheduled as soon as possible once feedback from the Department is received. The Department will also confirm the information requirements for the WUL technical report.

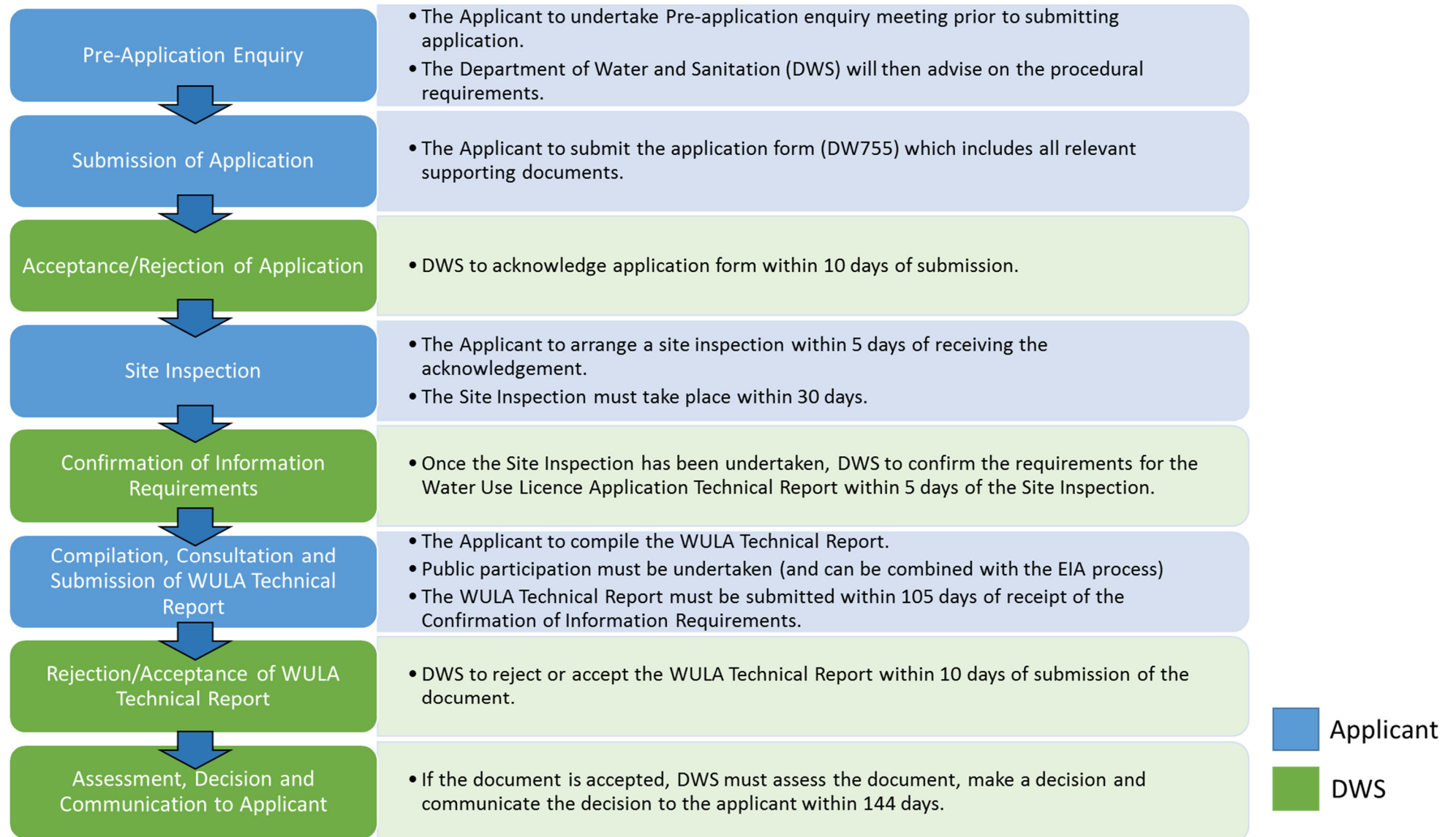


Figure 5-1: Water Use Authorisation Process

5.1.3 WULA Technical Report Compilation

Information gathering took place including desktop evaluation (via literature review, GIS, topographical maps etc.) as well as specialist studies conducted as part of the BAR. This information was used to compile the WULA Technical Report (this report) and associated WULA forms.

The WULA Technical Report is currently available for public review as part of the review of the BAR. The WULA Technical Report will then be submitted to DWS. All WULA forms will be completed online as per the requirements of the new E-WULAAS System.

5.1.4 DWS Assessment

This Assessment and review step involves the assessment and review of the WULA by the designated official at the DWS Gauteng Regional Office. Should all necessary information be included, the WULA Technical Report will be accepted.

DWS will then undertake a technical evaluation and assessment of the application. If issuing a licence is recommended, a draft licence containing the required conditions will be compiled. The Regional Office official will then submit the application, together with their recommendation, the draft licence, and the supporting documentation, to the relevant delegated authority, who will decide on the application after the Water Use Authorisation Assessment Advisory Committee (WUAAC) has adjudicated on the application.

The decision and the licence, if granted, will be returned by the relevant delegated authority to the official at the DWS Regional Office, who will inform the applicant of the decision.

5.2 Specialist Assessments

To ensure that there are no significant negative impacts to the water resources in the area, a number of specialist reports were undertaken included and have informed this report including:

- Wetland Assessment;
- Hydropedological Assessment; and
- Stormwater Management Plan.

These studies provided a number of mitigation measures to minimize impacts to water resources which have been included in the project specific Environmental Management Programme (EMPr). In addition, a Monitoring and Rehabilitation Plan has been compiled and will be included as part of the WULA Technical Report submission.

5.3 Gaps and Assumptions

The impacts identified as part of the various specialist studies have heavily influenced the risk assessment included in the Technical Report. As such, it is important to note the assumptions and limitations identified by the various specialists (related to water uses):

- Wetland Assessment:
 - The study was limited to a snapshot view during a few site visits. The field investigations were undertaken during November 2020 to assess and confirm the delineated Wetland zones present on the survey area. Weather conditions during the survey were favourable for recordings. The delineations were recorded by handheld GPS.
 - It must be noted that, during the process of converting spatial data to final output drawings, several steps are followed that may affect the accuracy of areas delineated. Due care has been taken to preserve accuracy. Printing or other forms of reproduction may also distort the scale indicated in maps. It is therefore suggested that the wetland areas identified in this report be pegged in the field in collaboration with the surveyor for precise boundaries.
 - It is unlikely that more surveys would alter the outcome of this study radically.
- Hydropedological Assessment
 - The study was limited to a snapshot view during a few site visits. The field investigations were undertaken on 19 November 2021 to assess and confirm the hydropedology of the survey area. Weather conditions during the survey were favourable for recordings. The location recordings were recorded by handheld GPS.
 - It must be noted that, during the process of converting spatial data into final output drawings, several steps are followed that may affect the accuracy of areas presented. Due care was taken to preserve accuracy. Printing or other forms of reproduction may also distort the scale indicated in maps. It is therefore suggested that the key areas identified in this report be pegged in the field in collaboration with the surveyor for precise boundaries.
 - It is unlikely that more surveys would alter the outcome of this study radically.

5.4 Description of Water Use Activities

5.4.1 Zoning

The proposed Strubensvallei Ext. 24 will involve the development of Erf 1327 and Erf 1328. The site is affected by the future Metro Boulevard planned by the Johannesburg Roads Agency which is excluded from the project footprint. Necessary access, internal roads and services will also be put in place.

The details of the proposed development are provided in Table 5-1.

Table 5-1: Details of planned development

	Erf 1327		Erf 1328
	Permissible/Minimum Required	Actual	
Zoning	Residential 3	Residential 3	Public Open Space
Site Area	1.9724 ha	1.9724 ha	0.63 ha
Height	3 Storeys (<i>with council consent</i>)	3 Storeys (<i>combination of 2 and 3 storey buildings</i>)	<i>N/A</i>

Coverage	40%	30%	N/A
Floor Area Ratio (FAR)	0.4	0.36	N/A
Density	40 units per hectare	36.50 units per hectare	N/A
Number of units	79 units	72 units	N/A
Number of Parking Bays	166 parking bays	169 parking bays	N/A
Refuse Area Details	41 m ²	45.95 m ²	N/A

5.4.2 Water and Sewer Services

A Water and Sanitation Outline Scheme Report has been developed by C-Plan Development Consultants and is included in Appendix G of the Basic Assessment Report.

In terms of existing services, the Study found that there is an existing 110mm-diameter Council water pipes within the Fiddle Avenue Road Reserve to the North of the study site. A new 110 mm diameter mPVC pipe (SANS 1283) will be put in place within the new access road and will connect to this existing pipe. The length of this connection is approximately 180m.

This pipeline will be constructed to Johannesburg Waters requirements as well as the necessary SABS Standards and handed over to Johannesburg Water upon completion and acceptance of the installed water infrastructure. An internal reticulation system will also be put in place but will remain the responsibility of the developer and will be maintained by the Section 21 Company for this development.

All fire hydrants will meet the standard requirements of the Johannesburg Fire Department.

Figure 5-2 shows the new 110mm water connection pipeline.

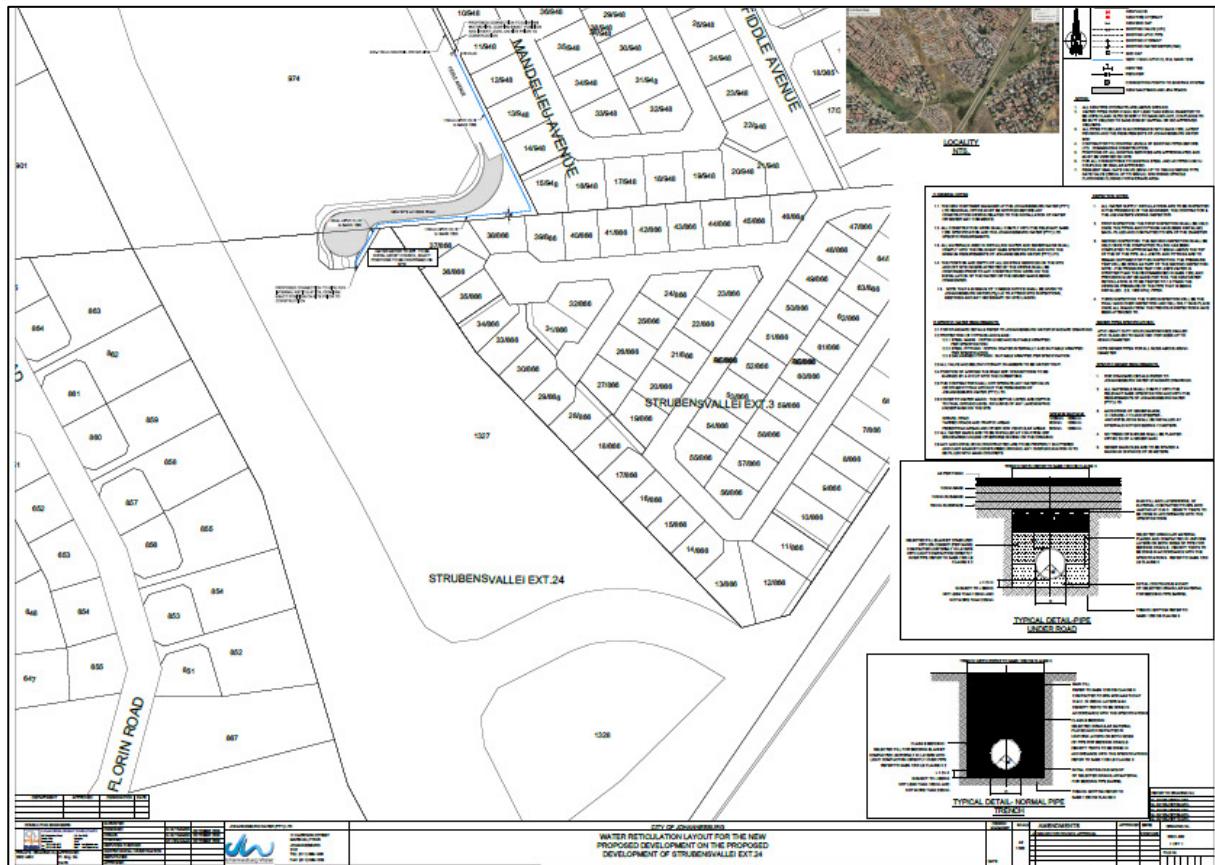


Figure 5-2: External Water Connection

In terms of Sewer, there are existing 150mm-diameter clay Council sewer pipe running along the Southern Boundary line of the development situated within the flood lines. In order to service the proposed development, a new 160mm-diameter uPVC CL 400 H/D pipe will connect into the existing sewer system by means of a new manhole. This new connection pipeline is approximately 51m in length.

All materials, construction and testing of the sewer reticulation will comply to the requirements of Johannesburg Water as necessary SABS Standards. Pipes will consist of uPVC Heavy Duty Class 400 as per SANS 1601. Manholes and chambers shall be constructed as specified in SANS 1294 with manholes comprising of precast concrete with dolomitic aggregate or fibre-cement rings (min. 1,05m nominal diameter). Manholes deeper than 3m shall be a minimum of 1.5m in diameter.

In addition, internal sewer reticulation will also be put in place and will remain private and maintained by the Section 21 Company for this development.

Figure 5-3 shows the new 160mm diameter connection as well as the existing line.

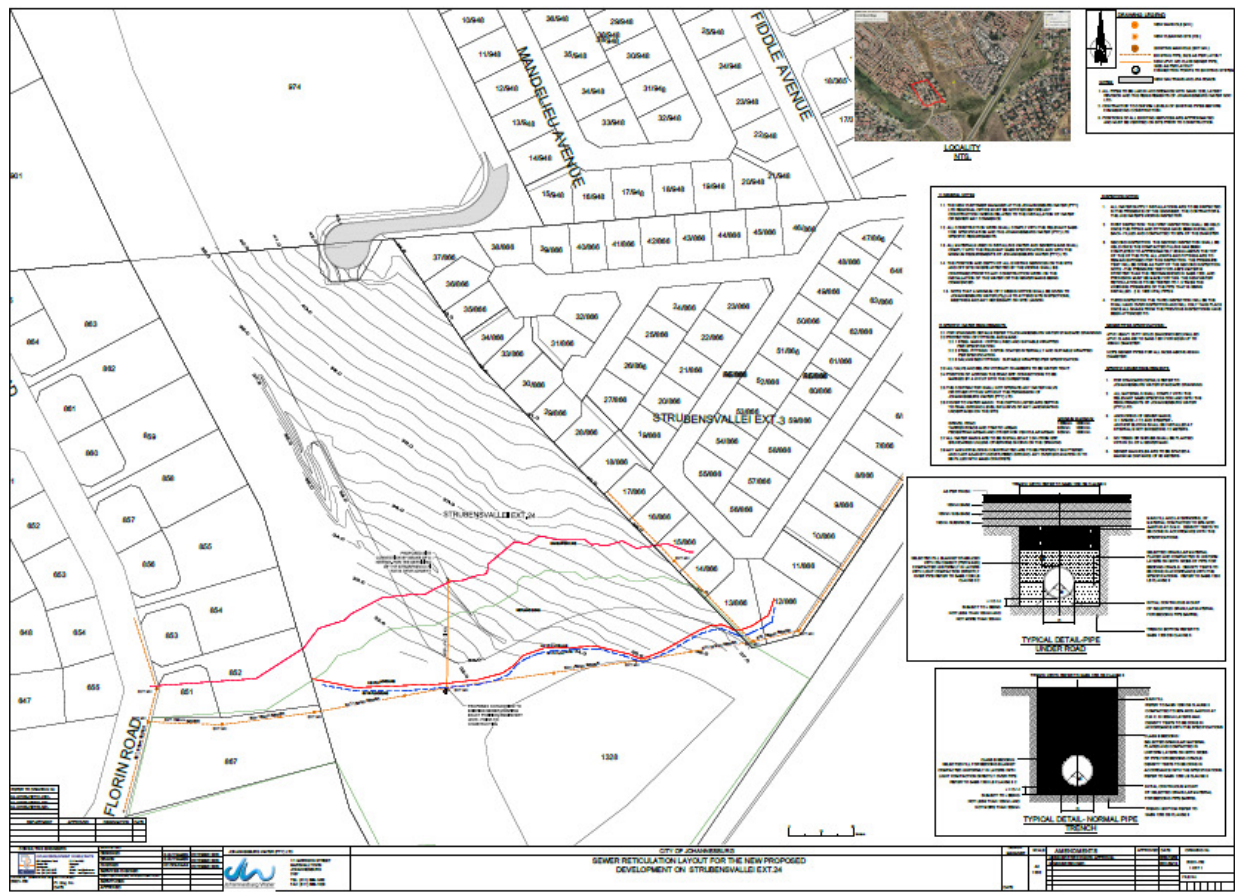


Figure 5-3: Sewer Layout

5.4.3 Stormwater Services

A Road and Stormwater Outline Scheme Report has been developed by C-Plan Development Consultants and is included in Appendix G of the Basic Assessment Report.

An internal stormwater reticulation system will be put in place and will utilize 160mm and 300mm pipes to direct stormwater to 300mm and 375mm OGEE pipe which will run down the eastern side of the development and lead to a stormwater attenuation pond which will be approximately 231 m² in extent.

From there, a 450mm OGEE pipe will discharge water under the proposed Metro boulevard into Erf 1348. The length of this pipe is approximately 79m.

All materials, construction and testing of the stormwater reticulation will comply with Johannesburg Road Agency requirements, as well as the necessary SABS Standards.

Figure 5-4 shows the internal stormwater reticulation as well as the attenuation structure and discharge pipeline.

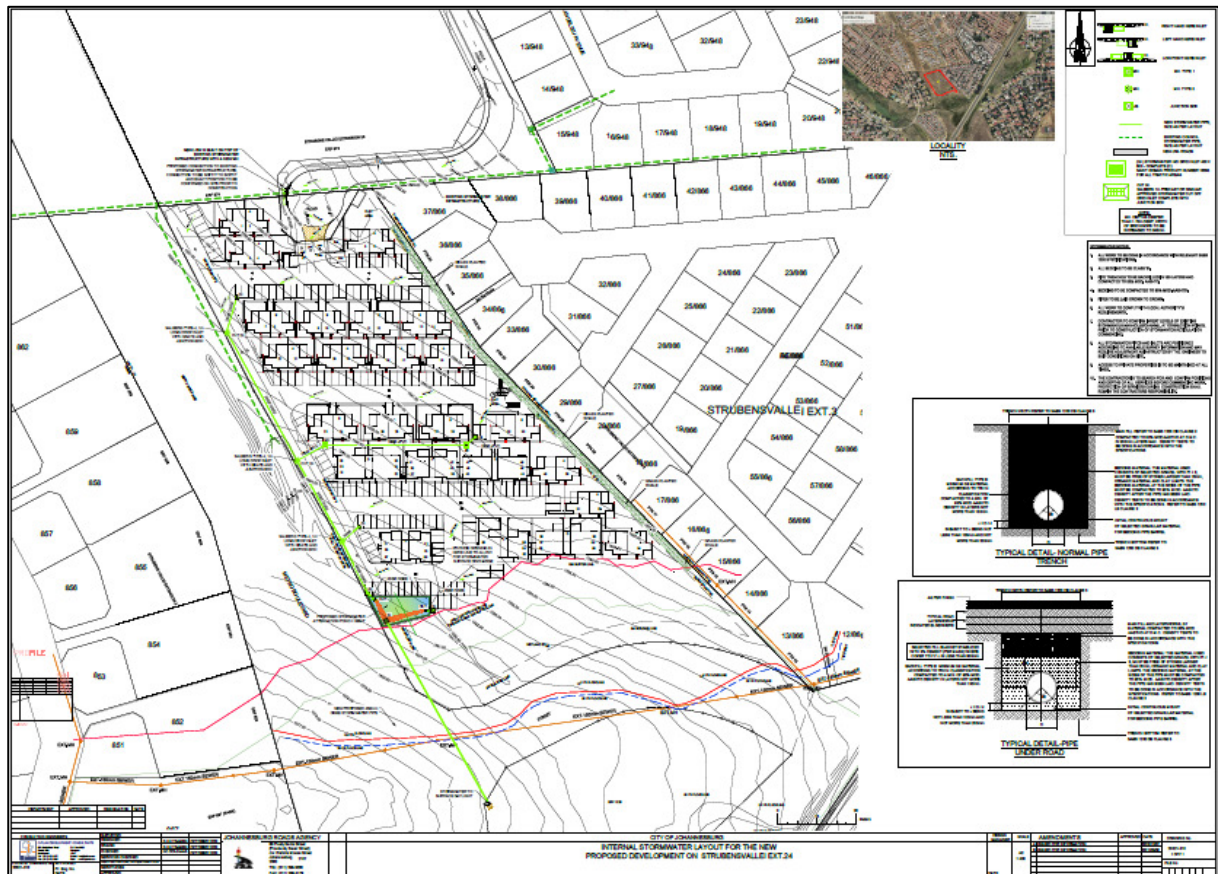


Figure 5-4: Internal Stormwater and Stormwater Attenuation

5.4.4 Roads and Access

A Road and Stormwater Outline Scheme Report has been developed by C-Plan Development Consultants and is included in Appendix G of the Basic Assessment Report. Further, a Traffic Impact Assessment has been undertaken by Mariteng Consulting Engineers and is also included in Appendix G. The latter found that the proposed development will generate 59 trips, during the weekday morning and weekday afternoon peak hours respectively. No external road upgrade required to accommodate the traffic demand.

The site access will be provided from the cul-de-sac intersecting with Fiddle Avenue. As part of the development, this new cul-de-sac and new section of surfaced road extending to the existing Fiddle Avenue road surface will be constructed to council standards and handed over to council upon completion and acceptance of the road infrastructure.

This road will include one inbound lane with a minimum width of 3.0m and one outbound lane with a minimum width 4.5m. A 2m paved sidewalk along the northern side of the cul-de-sac will also be provided.

Figure 5-5 shows this access road.

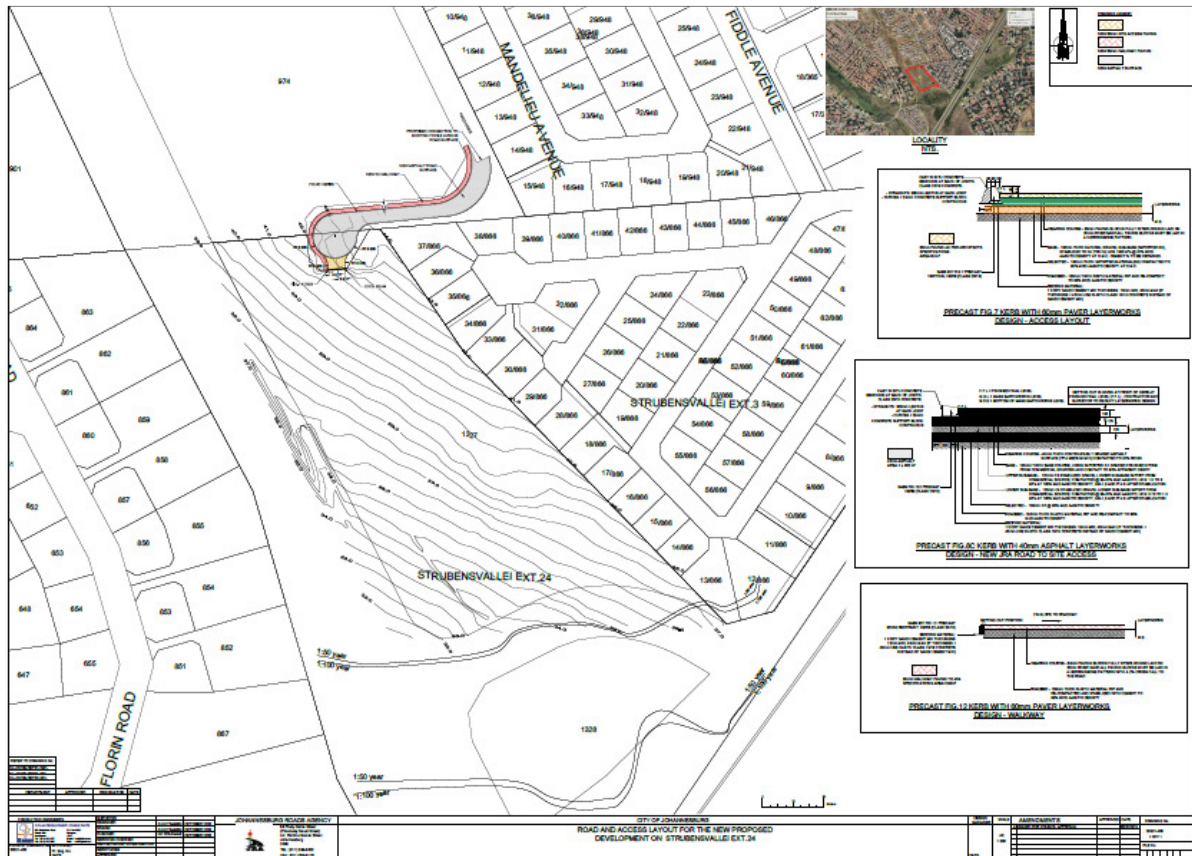


Figure 5-5: Access Road

5.5 Water Uses

According to Section 22 of the NWA a person may only use water under the following circumstances:

- Without a license –
 - o If that water use is permissible under Schedule 1;
 - o If that water use is permissible as a continuation of an Existing Lawful Use; or
 - o If that water use is permissible in terms of a General Authorisation issued under Section 39;
- If the water use is authorised by a license under this Act; or
- If the responsible authority has dispensed with a license requirement under Section 22(3) of the Act.

In the case of this project a licence is required to undertake the water uses that are associated with the project, based on the likely risk, nature, and extent of potential impacts of the proposed project on the affected water resources.

5.5.1 Existing Lawful Water Uses

The applicant, the Renico Construction (Pty) Ltd., does not have any Water Use Licenses awarded to them for the development of the Erf 1327 and 1328, Strubensvallei Extension 24.

5.5.2 Relevant Exemptions

There are no relevant exemptions applicable.

5.5.3 Generally Authorized Water Uses

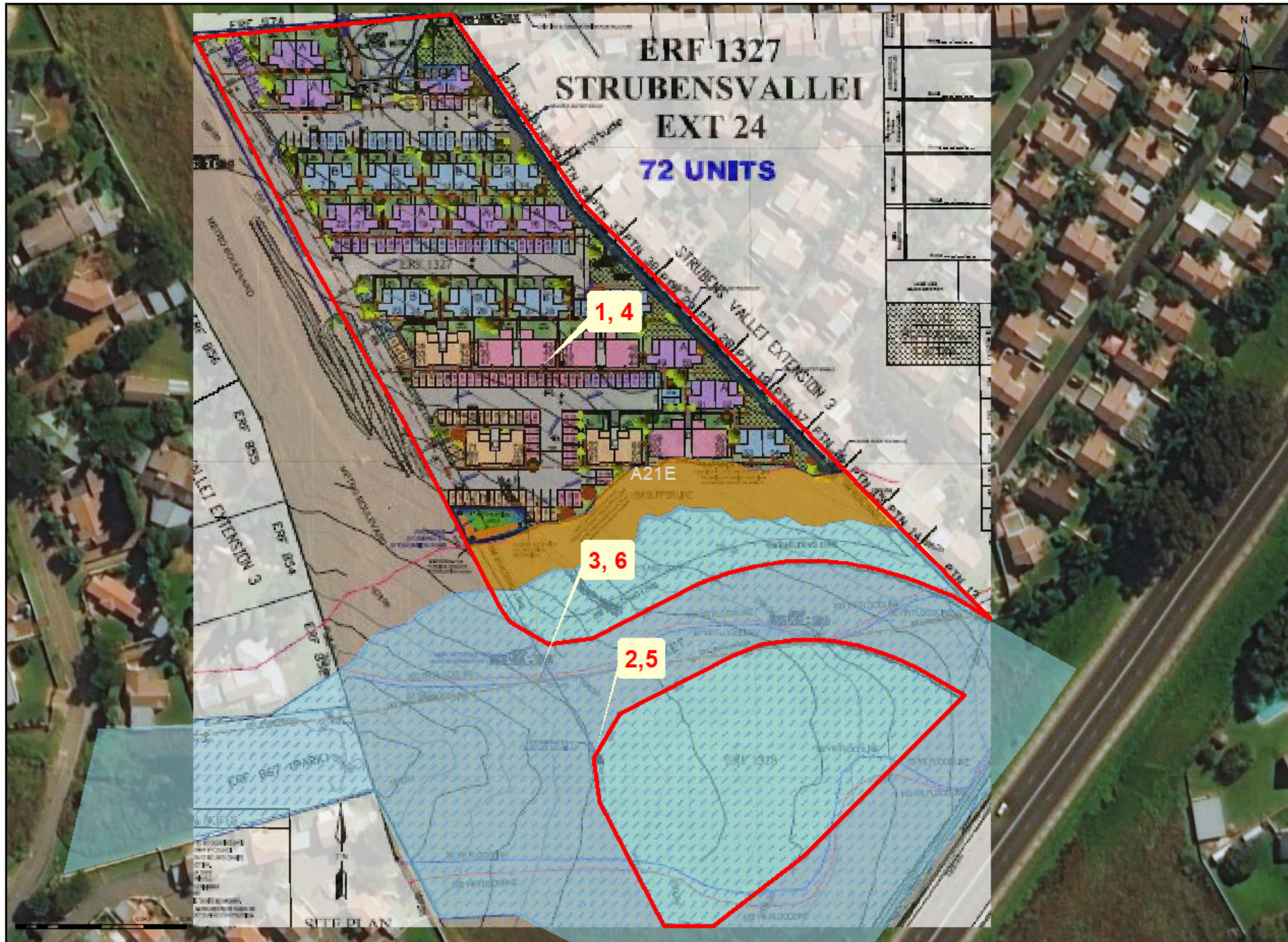
In terms of Section 22(1) of the NWA a person may use water without a license if that water use is permissible in terms of a General Authorisation (GA) issued under Section 39 of the Act. An assessment was done of the General Authorisations under the NWA and the following GAs are in place:

- General Authorisation in terms of Section 39 of the National Water Act (Act No 36 of 1998) for water uses as defined in Section 21 (c) or Section 21 (i) (GN 509 of 2016).
 - Due to the fact that the project involves a sewer pipeline as well as internal sewer reticulation within the wetland and within 500m of the wetland, respectively, the GA does not apply.
- General Authorisation in terms of Section 39 of the National Water Act, 1998 (Act No 36 of 1998) in terms of Section 21 (c) and (i) for the purpose of rehabilitating a wetland for conservation purposes (GN 1198 of 18 December 2009):
 - This is only applicable to organs of state undertaking wetland rehabilitation. Further, the GA notes that the GA does not apply if the water user must make additional activities in terms of Section 21 of the Act. As such, this GA is not applicable.

Thus, whilst a number of general authorisations exist for the activities identified above, they are not applicable due to the proximity of the project to wetlands on site and the fact the development includes sewer services. Therefore, all water uses will be applied for under Section 21 of the National Water Act below.

5.5.4 Description of New Water Use

In order to ensure ease of understanding, an overview of all water uses is provided in Figure 5-6. This table correlates to the Water Use License Application Forms that will be submitted to DWS as part of the Final Technical Report. Please note that the only the starting point coordinates are shown on the maps.



1, 4 Section 21 (c) and (i)
Development and services
within 500m of a wetland
26° 7'6.51"S
27°54'43.76"E

2,5 Section 21 (c) and (i)
Stormwater attenuation and
release
26° 7'10.19"S
27°54'44.32"E

3,6 Section 21 (c) and (i)
Sewer connection to existing
sewer line within wetland
26° 7'9.52"S
27°54'43.67"E

PROJECT:
**ERF 1327 AND 1328
STRUBENSVALLEI EXT 24**
WATER USE LICENCE
APPLICATION

GENERAL NOTES:
Coordinate System: WGS 1984 World Mercator
Projection: Mercator
Datum: WGS 1984

Water Use Licence
Application Map

Legend
 Study Site
 Delineated Wetland
 15m buffer
 Quaternary Catchments

REVISIONS:
FINAL

CLIENT: Renico Construction (Pty) Ltd	SCALE: 1:1,350
	DRAWING REF: 22040-WULA-1
	DRAWING STATUS: FINAL

PRISM ENVIRONMENTAL MANAGEMENT SERVICES 15
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 www.prismems.co.za

Figure 5-6: Water Uses

Table 5-2: Details of the water uses being applied for

Form Ref (Related to Online System*)	Property Details	Water Use	Description of Water Use	Dimensions (m / m³)/Details	Purpose	Co-ordinates		QC
						Start	End	
1,4	Portion 1327 and 1328, Strubensvallei Extension 24	Section 21 (c) and (i)	Development and services within 500m of a wetland	<p>The proposed Strubensvallei Ext. 24 will involve the development of Erf 1327 and Erf 1328. The following rights are applicable to Erf 1327:</p> <ul style="list-style-type: none"> • Zoning: Residential 3 • Site Area: 1.9724 ha • Height (with council consent)) 3 Storeys (with council consent)) • Coverage 40% • Floor Area Ratio (FAR) 0.4 • Density 40 units per hectare • Number of units 72 units • Number of Parking Bays: 166 parking bays • Refuse Area Details 41 m² <p>Erf 1328 will not be developed but will remain public open space.</p> <p>The site is affected by the future Metro Boulevard planned by the Johannesburg Roads Agency which is excluded from the project footprint. Necessary internal services and roads will also be put in place.</p>	The purpose of the development is to create a Residential township with necessary services and access.	26° 7'6.51"S 27°54'43.76"E		A21E
2,5	Portion 1327 and 1328, Strubensvallei Extension 24		Stormwater attenuation and release	<p>An internal stormwater reticulation system will be put in place and will utilize 160mm and 300mm pipes to direct stormwater to 300mm and 375mm OGEE pipe which will run down the eastern side of the development and lead to a stormwater attenuation pond which will be approximately 231 m² in extent.</p> <p>From there, a 450mm OGEE pipe will discharge water under the proposed Metro boulevard into Erf 1348. The length of this pipe is approximately 79m.</p> <p>All materials, construction and testing of the stormwater reticulation will comply with Johannesburg Road Agency requirements, as well as the necessary SABS Standards.</p>	To properly manage and release stormwater	26° 7'7.59"S 27°54'42.81"E	26° 7'10.19"S 27°54'44.32"E	
3,6	Portion 1327 and 1328, Strubensvallei Extension 24		Sewer connection to existing line	<p>In terms of Sewer, there are existing 150mm-diameter clay Council sewer pipe running along the Southern Boundary line of the development situated within the flood lines. In order to service the proposed development, a new 160mm-diameter uPVC CL 400 H/D pipe will connect into the existing sewer system by means of a new manhole. This new connection pipeline is approximately 51m in length.</p> <p>All materials, construction and testing of the sewer reticulation will comply to the requirements of Johannesburg Water as necessary SABS Standards. Pipes will consist of uPVC Heavy Duty Class 400 as per SANS 1601. Manholes and chambers shall be constructed as specified in SANS 1294 with manholes comprising of precast concrete with dolomitic aggregate or fibre-cement rings (min. 1,05m nominal diameter). Manholes deeper than 3m shall be a minimum of 1.5m in diameter.</p>	To allow for the proper management of sewer through the connection to an existing sewer pipeline.	26° 7'7.76"S 27°54'43.62"E	26° 7'9.48"S 27°54'43.54"E	

*Please note as per the requirements of the online system, a separate activity number is provided for Section 21 (c) and (i) activities.

6 PROFILE OF THE RECEIVING ENVIRONMENT

6.1.1 Temperature

The climatological data for the Roodepoort Area is provided below. In terms of temperature, average temperatures for the period 2010 to 2020 ranged between 20°C and 29°C in summer and between 9°C and 17°C in winter (www.worldweatheronline.co.za) (**Error! Reference source not found.**).

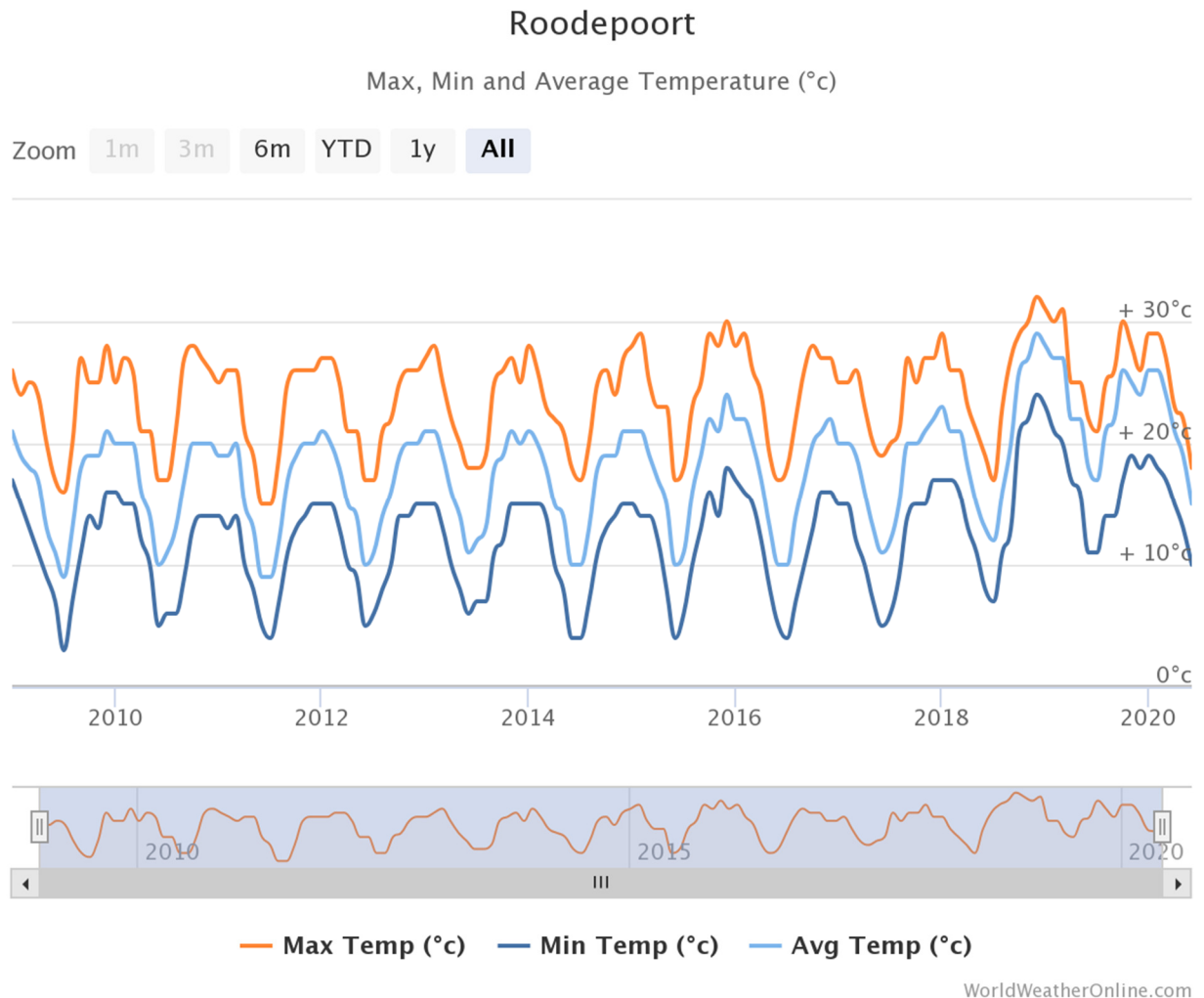


Figure 6-1: Minimum, Maximum and Average Temperatures for Witpoortjie, Gauteng (www.worldweatheronline.co.za).

6.1.2 Rainfall

The average rainfall amount in the area ranged from between 293 mm and less than 10mm (**Error! Reference source not found.**).

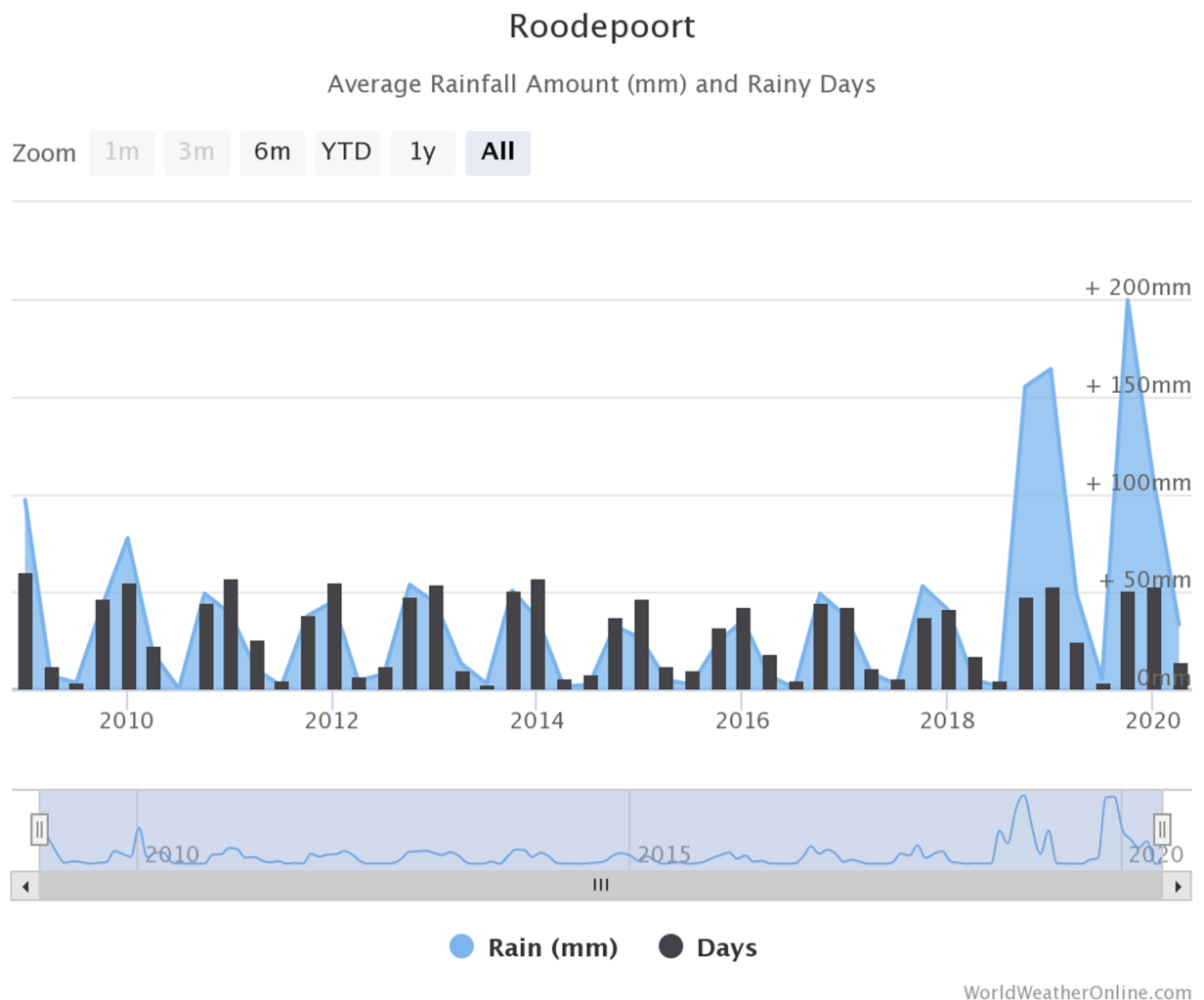


Figure 6-2: Rain amount and rain days for Witpoortjie, Gauteng (www.worldweatheronline.co.za).

6.2 Surface Water

Information on the status of the surface water environment is provided in the subsections that follow. Where applicable, information has been sourced from the Wetland Assessment undertaken by Prism EMS in 2020 (**Annexure 11.3**).

6.2.1 Desktop Assessment

As part of the Wetland Assessment, a desktop assessment was undertaken. The Department of Water and Sanitation (DWS) database was also consulted to obtain historical data for the study area. The National Wetland Map version 5 (NWM5) as presented by South African National Biodiversity Institute (SANBI) was also scrutinised (Van Deventer *et al*, 2019).

During the desktop investigation, one (1) possible area where wetlands could occur was identified on or in close proximity to the study site that would be affected by the proposed development activities. The wetland as indicated by the NWM5 wetland layers were further investigated on site.

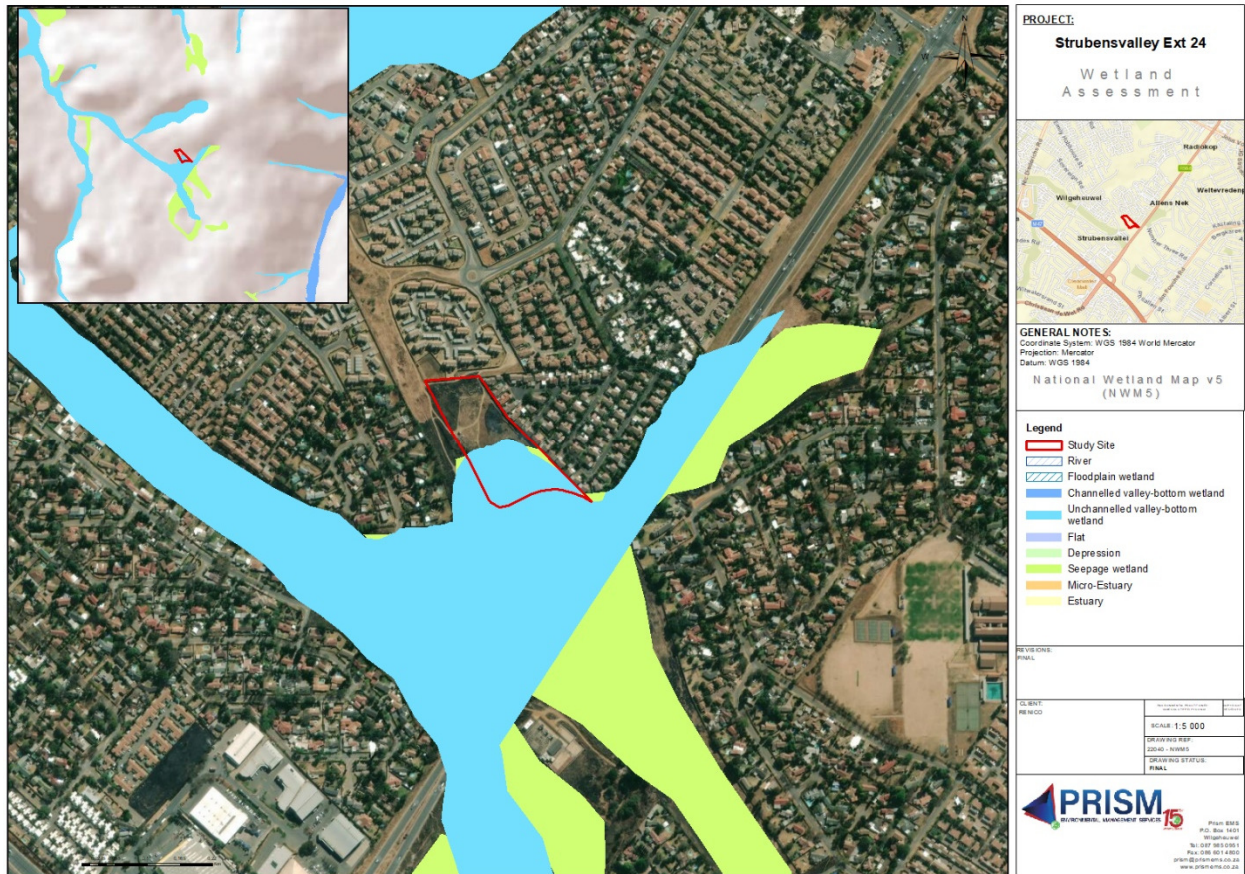


Figure 6-3: National Wetland Map version 5 (NWM5) (Van Deventer *et al.*, 2019) (From Prism EMS, 2020)

6.2.2 Field Investigation

The Wetland Assessment also included field investigations. These were undertaken during November 2020 to assess and confirm the delineated Wetland zones present on the survey area. The field investigations concluded that one natural wetland unit could be recorded as per the DWAF, 2005 guidelines (Figure 6-4) (SV24_UCVB – Unchanneled Valley Bottom Wetland - was found on the valley floor close to the head of the catchment, draining towards the West).

The wetland recorded was assessed and the following results were attained:

- The wetland attained a moderate overall PES (Present Ecological State)
 - SV24_UCVB was found to be moderately modified. A moderate change in ecosystem processes and loss of natural habitats has taken place but the natural habitat remains predominantly intact. This wetland system is impacted by historical activities both in the catchment as well as directly on the wetland system where the impacts are continues. It forms part of a larger wetland system. The trajectory of change for the wetland ecological status is predicted that conditions are likely to deteriorate slightly over the next 5 years without major intervention.
- The wetland attained a Moderate Ecological Importance and Sensitivity (EIS) score.
 - The SV24_UCVB, Unchanneled Valley Bottom Wetland is considered ecologically important and sensitive on a local scale. The biodiversity of this wetland is generally not sensitive to flow and habitat modifications. It plays a small role in moderating the quantity and quality of water of major

rivers. The system drains into further downstream wetland and streams before reaching major rivers. The Ecological Importance and Sensitivity (EIS) for this system is thus considered to be Moderate.

- The wetland Recommended Ecological Classification (REC) classification was rated as:
 - The wetland will be impacted to some extent by the proposed development activities, but a major impact is envisaged for the future road upgrades planned (Metro Boulevard Intersection). This impact will be localised and at the transitional point leading from the development and infrastructure installations into the wetland and buffer area. It will in all likelihood regress slightly in terms of its current Ecological Category if not managed in specific during the construction period. Stormwater management for the site is required in specific the construction phase. This will mitigate the impact on the wetlands. Rehabilitation of the impacts and maintenance of the system will further mitigate the impacts and could improve the sustainability of the system. It is thus rated that the Recommended Ecological Category (REC) should fall into:
 - Category C for SV24_UCVB

In summary, the specialist found that this wetland is largely disturbed due to historical impacts and is of low ecological importance. Furthermore, the wetland will be affected by the roads intersection upgrade linking Christiaan DeWet Drive and the proposed Metro Boulevard. This will impact the wetland system dramatically and alter the total functioning of the wetland. Be that as it may, it was still suggested that a 15m buffer on the current wetland be accommodated to buffer the development from the wetland. The buffer will suffice in the required management of the development impacts and continuation and maintenance of the wetland drivers. This conservation buffer should be utilised as the control area and will be adequate to assist with management and mitigation during the construction and operation phase.

For this reason, it can be supported that the development may go-ahead if the required buffers are maintained and the resource drivers preserved by well-constructed stormwater infrastructure for the Township development. In respect of the construction phase, it is important to ensure that the required erosion protection measures linked to the intersecting sections be carefully designed and installed. It is further important to carefully design the storm water outlet structures to assist with dispersed flow release into the wetland. This should be designed to mimic the natural sheet flow into the wetland and avoid concentrated flow patterns into the wetland area.

The project can be supported, should all the mitigation measures be implemented and monitored against to ensure compliance.



Figure 6-4: Wetland and Wetland Buffer Zones (Prism EMS, 2020)

6.3 Hydropedology

Hydropedology is the emerging field formed from the intertwining branches of soil science and hydrology. Information below has been sourced from the Hydropedology Assessment undertaken by Prism EMS in 2021 (Annexure 11.3.3).

6.3.1 Desktop Assessment

A preliminary desktop assessment was undertaken using aerial photographic interpretation and Geographic Information Systems (GIS) analysis of the study site. Historical records and reports were consulted. The Department of Water and Sanitation (DWS) database was also consulted to obtain historical data for the study area. Historical data and official approvals were also consulted during the assessment.

6.3.2 Field Investigation

6.3.2.1 Methodology

The field investigation was undertaken **19 November 2021** to assess and corroborate the pedogenetic evolution driven by hillslope hydrological input and controls as presented on the survey area.

The field procedure for the hydropedological assessment was conducted according to the Guidelines for Hydropedological Assessments and Minimum Requirements as set out by the Department of Water Affairs and Forestry (DWS 2021).

The guidelines for Hydropedological assessments:

- **Step 1: Identification of the representative hillslope/s**
 - Identify land types (Land Type Survey Staff, 1972 – 2006) within the study area.
 - Identify dominant hillslopes (from crest to stream) of the study area using terrain analysis.
 - There should be at least one hillslope in each land type of the study area.
 - Hillslopes should be representative of the topography (e.g. slope, aspect and curvature) and land types.
 - For example, where the site is divided by a stream, a representative hillslope should be identified on both sides of the stream.
- **Step 2: Conceptualise hillslope hydropedological responses**
 - Transect survey
 - Transect soil survey should be conducted on each of the identified hillslope (Le Roux et al., 2011).
 - Soil observations should be made at regular intervals, not exceeding 100 m, on the transect.
 - Profile pits of representative soil forms should be opened to proper description, photographs and collection of undisturbed samples.
 - Observation depth should be until refusal. Where the soil depth exceeds 2m, auger observations must be made in the bottom of the pit in order to describe soil/saprolite/bedrock transition.
 - Soil description and classification
 - Soils should be described and classified in accordance with the South African Soil Classification system up to family level (Soil Classification Working Group, 2018).
 - The following morphological properties should be described:
 - Thickness of horizons
 - Structure (size, grade, type)
 - Estimated texture
 - Matrix Munsel colour (moist and dry)
 - Mottles (colour, size, frequency, prominence and type)
 - Concretions (colour, size, frequency, prominence and type)
 - Precipitation of carbonates, gypsum or salts
 - Roots (abundance)
 - Macropores (frequency and size)
 - Nature of transition between horizons/bedrock/saprolite
 - Profile should then be regrouped into one of the seven hydropedological groups (van Tol & Le Roux, 2019).
- Conceptual hillslope hydropedological response

- The occurrence, sequence and coverage of the different hydrogeological groups on a transect must then be used to describe the hydrological behaviour of the hillslope (van Tol et al., 2013).
- This will include a graphical representation of the dominant and sub-dominant flowpaths at hillslope scale prior to development. This will include:
 - Overland flow
 - Subsurface lateral flow
 - Bedrock flow and
 - Return flow
 - Storage mechanisms
- The impact of the proposed development on the hydrogeological behaviour should also be graphically presented. This should typically include the location of the development on the hillslope and the anticipated impact of the development on water flows.

6.3.2.2 Findings

The site expresses the pedogenetic evolution driven by hillslope hydrological input and controls. The hydrogeology is expressed as vertically heterogeneous pedogenetic strata of independent genetic hydromorphic expressions, as well as the integration thereof as phenetic hydromorphic expressions.

The site forms the transition of various sub catchments and surface sealed/alterred springs upslope, drained by valley bottom confluences with elevation in the hillslope, however manipulated through the colluvial strata forming the parent material and leading to the deflection through strata specific genetic and phenetic hydrogeological reaction.

The spatial distribution of lateral colluvial strata is thus expressed as benched seep wetlands respectively within the confluence forming the tributary of the Wilgespruit. The various separate colluvial strata however are subject to the hillslope crest recharge, to midslope interflow of shallow and deep duplicate expression, and responsive in the wetland.

The hydrograph thus will have a longer/larger baseflow contribution from crest driven recharge to deep interflow down the midslope to respond within the wetland. The hydrograph will on the increase and decrease in slope over time, thus be subject to the various spatio-temporal disturbances within the overlying colluvial layers of various origin and thus different biogeochemical reaction in the wetland.

The intensity of iron and the expression in elevation of manganese above stream channel where relatively high in the profile, relative to the expression of the Albic horizon in the vertical extent of the profile, forms the upper tip of the wetland. This is the wetland that extends vertically up the hillslope, where within the lower topographically set wetland, this minute expression becomes the gleic and gley hydromorphological character of the soils within the entire vertical extent of the profile, referred in text as the biological separation zone. The wetland thus forms where the lateral force is drawn down by the porous connectivity of the soil and the surface and soil fauna & flora afford the rapid redox process via its hydrological response.

The shallow hydrological biological response thus functions as the product best suited to mitigate the vertical force of water, down the hillslope.

The site is thus hydropedologically complex, yet once the extent and location of various processes and expressions (flowpaths and storage mechanisms express, naturally) is understood, appropriate mitigative actions can be taken to divert the functionality to be in functionality with the imposed arbitrary development. A geohydrological investigation is necessary to afford confidence to risk relative to the bedrock conditions. A (the) geophysical assessment of the hydropedological, geohydrological, and geophysical data, once available, must be conducted.

Figure 6-5 indicates the Conceptual Hydrological Response Map of the study site and is followed by Figure 6-6 which illustrates the Soil Form Distribution of the study site.

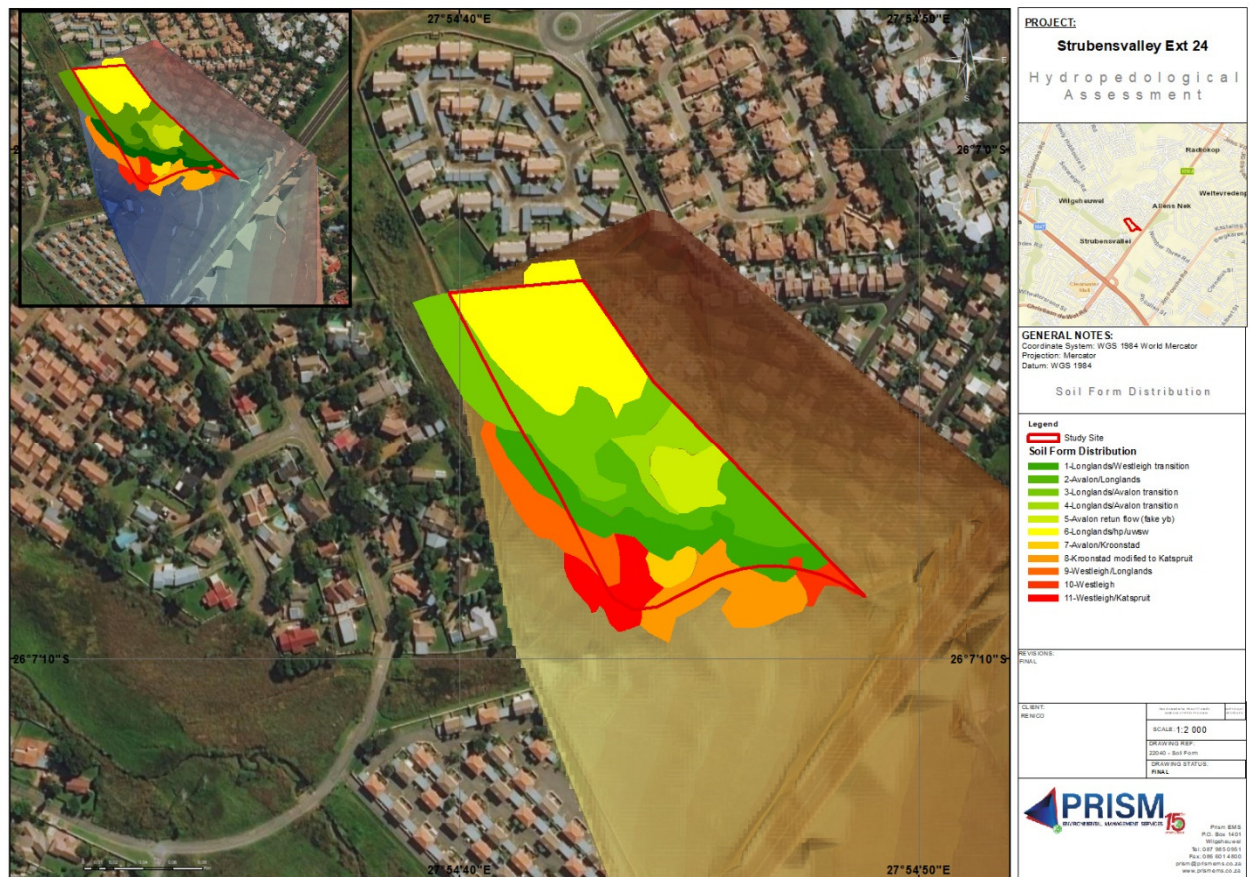


Figure 6-5: Soil Form Distribution with insert of conceptual hydrological response (top left).

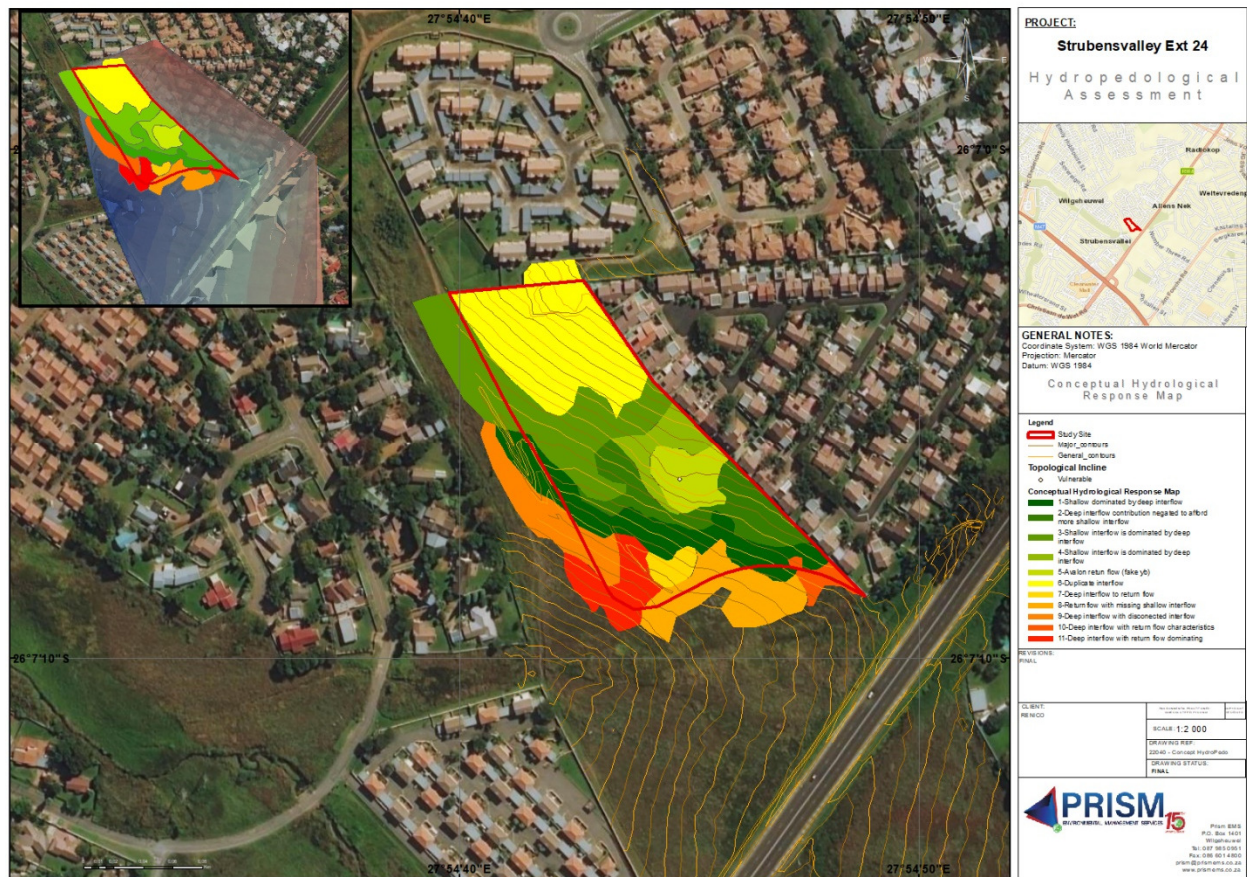


Figure 6-6: Conceptual Hydrological Response Map with insert of soil distribution map (top left

The site affords “X” amount of water storage and flux capacity. Both factors are of a high value, where conventional cut and fill will have to be cognisant of risk by fracturing or impeding the biological separation zone. The displacement of soil porous media, as well the introduction of impervious vertical concrete/masonry walls, will promote flux and duration of flux to move between the units envisaged to be developed as per standard protocol. Indications by the geotechnical report confirm storage and flux.

It is suggested that suitable infill for benching be afforded, primarily as the site holds the entire hillslope (via the plug) in balance. The invasion of the existing soil substrate will require high level hydropedological analysis (level 3&4 according to the Department of Water and Sanitation (DWS) Guidelines for Hydropedological Assessments), whereas the infilling of suitable materials will provide for the increased capacity of the site to mitigate future envisaged developments along the bottom of the site (i.e. the construction of the Metro Boulevard and intersection with Christiaan de Wet Road), simultaneously allowing for minimal destruction of the existing hillslope ‘plug’.

Where shallow interflow is dominated by deep interflow (Unit 4, Figure 6-6), a separate/unique mitigation must be afforded. The implicit flowpath is of high flux and reduction value, relative to the surrounding soils (Unit 4, Figure 6-6).

The following are recommended:

- Onsite consultation with hydrogeologist prior and during services installation
- Onsite consultation with hydrogeologist prior and during cut and fill design (levels to be determined)
- Bedrock was not encountered during the survey. (Geo-tech report also corroborates same). Soil rock interface was not encountered due to limitation of the use of TLB machinery. Hand auguring was not permissible due to the hardness of the material. It is thus recommended that a mechanical (drill type) investigation be conducted to confirm bedrock conditions.
- The topological backslope area (Unit 4, Figure 6-6) should be further investigated in terms of the annual duration of saturation as factor for the reduction i.e. maturation of the soil (gleying).
- It should be attempted to enhance the current wetland function.
 - Wetland drivers should be maintained as far as possible.
 - Water quality preservation is key.

6.4 Socio-Economic Environment

The proposed development occurs within the City of Johannesburg in Gauteng. A summary of the socio-economic environment for the City of Johannesburg (obtain from StatsSA) is included below.

The City of Johannesburg Local Municipality is situated in Gauteng province and covers an area of 1 645km². The City is the provincial capital of Gauteng, the wealthiest province in South Africa. According to Census 2011 information, the area has a total population of 4,4 million of which 76,4% are black African, 12,3% are white people, 5,6% are coloured people, and 4,9% are Indian/Asian.

Figure 6-7 below shows that the majority of people in the area have either some primary school education (33.6%) or secondary education (30%). Only 20.8% of the population has completed secondary school and an even smaller percentage (5.3%) have higher education (Stats SA, 2017).

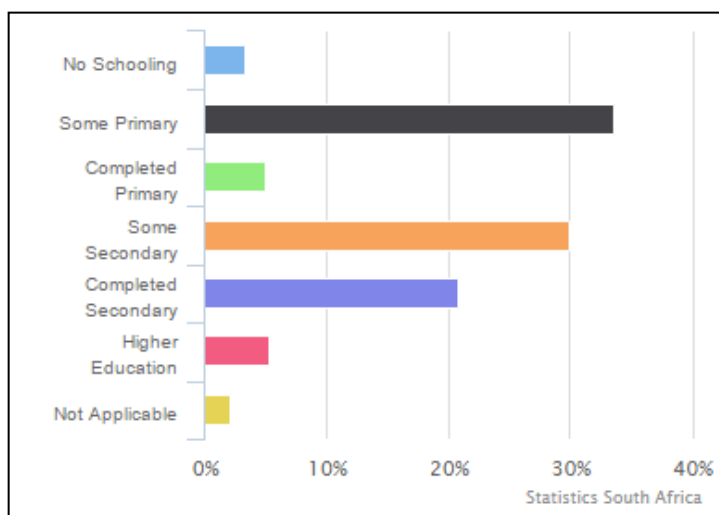


Figure 6-7: Highest Education Level (All Ages) (Stats SA, 2017).

Approximately 72.7% of the population are at a working age (15-64). Of those, approximately 52.6% (1 696 520 people) are employed (Figure 5). The unemployment rate for the area is 25%. Of the 1 228 666

economically active youth (15–35 years) in the area, 31,5% are unemployed. In terms of living conditions, there is 1 434 856 households in the municipality with an average household size of 2,8 persons per household. 64,7% of households have access to piped water, 26,9% have water in their yard and only 1,4% of households do not have access piped water (Stats SA, 2017).

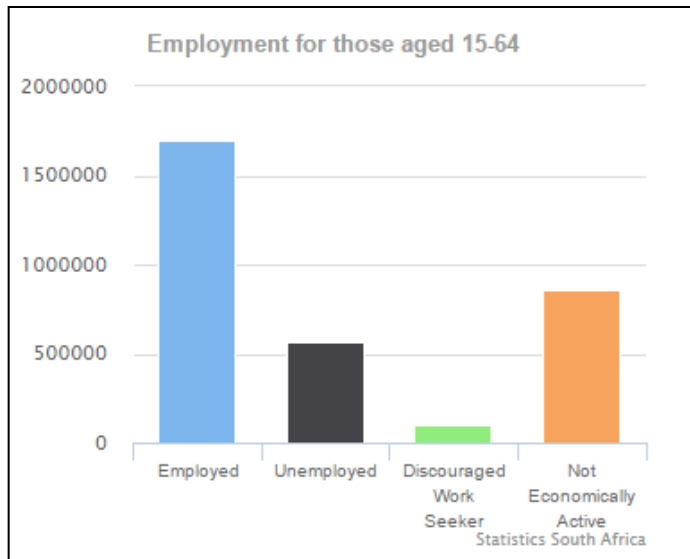


Figure 6-8: Employment for those aged 15-64 (Stats SA, 2017)

6.4.1 Need and Desirability

In terms of the need and desirability of the project, it should be noted that the proposed development will further the objectives of the Region C Regional Spatial Development Plan (RSDF) by supporting the development, infill and densification of Sub Area 7 within the Urban Development Boundary (UDB) (Intervention 1 of Development Objective 1). This includes the following guidelines:

- Support residential densities of between 40-60 dwelling units/ha to promote infill; and
- Development with the Urban Development Boundary”

The proposed development occurs within the UDB and has a density of 40 units per hectare. It is therefore in line with the RSDF.

The development also occurs within the Consolidation Zone within the City of Johannesburg Spatial Development Framework 2040. According to the SDF, this area must be the focus of urban consolidation, infrastructure maintenance, controlled growth, urban management, addressing backlogs (in social and hard infrastructure) and structural positioning for medium to longer term growth. The policy intent in these areas would be to ensure existing and future development proposals are aligned as far as possible with the broader intent of the SDF, specifically in terms of consolidating and diversifying development around existing activity nodes and public transport infrastructure. In this broad area, new development that does not require bulk infrastructure upgrades should be supported. The proposed Strubensvallei Extension 24

development, does not require bulk infrastructure upgrades and is thus in line with the objectives for the consolidation zone.

Lastly, the development footprint of proposed development falls within Zone 1: Urban Development Boundary (UDB) of the Gauteng Provincial Environmental Management Framework (GPEMF). The intention of this zone is *“to streamline urban development activities in it and to promote development infill, densification and concentration of urban development within the urban development zones as defined in the COJ Spatial Development Framework (GSDF), in order to establish a more effective and efficient city region that will minimise urban sprawl into rural areas.”* The proposed development is therefore in line with the GPEMF. Whilst Erf 1328 falls within Zone 2 of the GPEMF, this erf will be zoned as Public Open Space and will not be developed.

Lastly the proposed development will provide numerous economic benefits. Firstly, during construction, there will be a direct CAPEX spend. Secondly, a number of construction and operation related employment opportunities will be created. This will also have several economic multiplier effects for the local economy.

7 ALTERNATIVES ASSESSED AS PART OF THE BAR

As part of the development planning process for the proposed development, several technical assessments have been undertaken including the following:

- Outline Scheme Report
- Traffic Impact Assessment;
- Geotechnical Assessment; and
- Stormwater Management Plan.

Discussions with the technical team as well as the wetland specialist were then undertaken to determine the requirements of the development and to ensure that the concept of sustainability was taken into account. As part of these discussions, two layouts were developed as follows:

- Proposed layout (Proposal); and
- Alternative layout (Alternative 1).

7.1.1 Proposal

The proposal involves of 72 “Residential 3” units as well as the necessary attenuation outside the wetland and wetland buffer area. Two play areas are also provided (at the entrance of the development and along the south-eastern boundary). Most importantly, this layout includes a 15m buffer area which was requested by the City of Johannesburg (Figure 7-1)

7.1.2 Alternative 1

In contrast, Alternative 1 involves the development of 58 “Residential 3” units. Whilst attenuation is provided, it occurs within Erf 1328 (i.e. within the wetland). In addition, only one small play area is provided. Lastly, no wetland buffer is provided at all. Whilst the wetland to the south of the site will be destroyed by the development of Metro Boulevard, COJ has requested a 15m buffer and this layout does not meet this requirement (Figure 7-2).

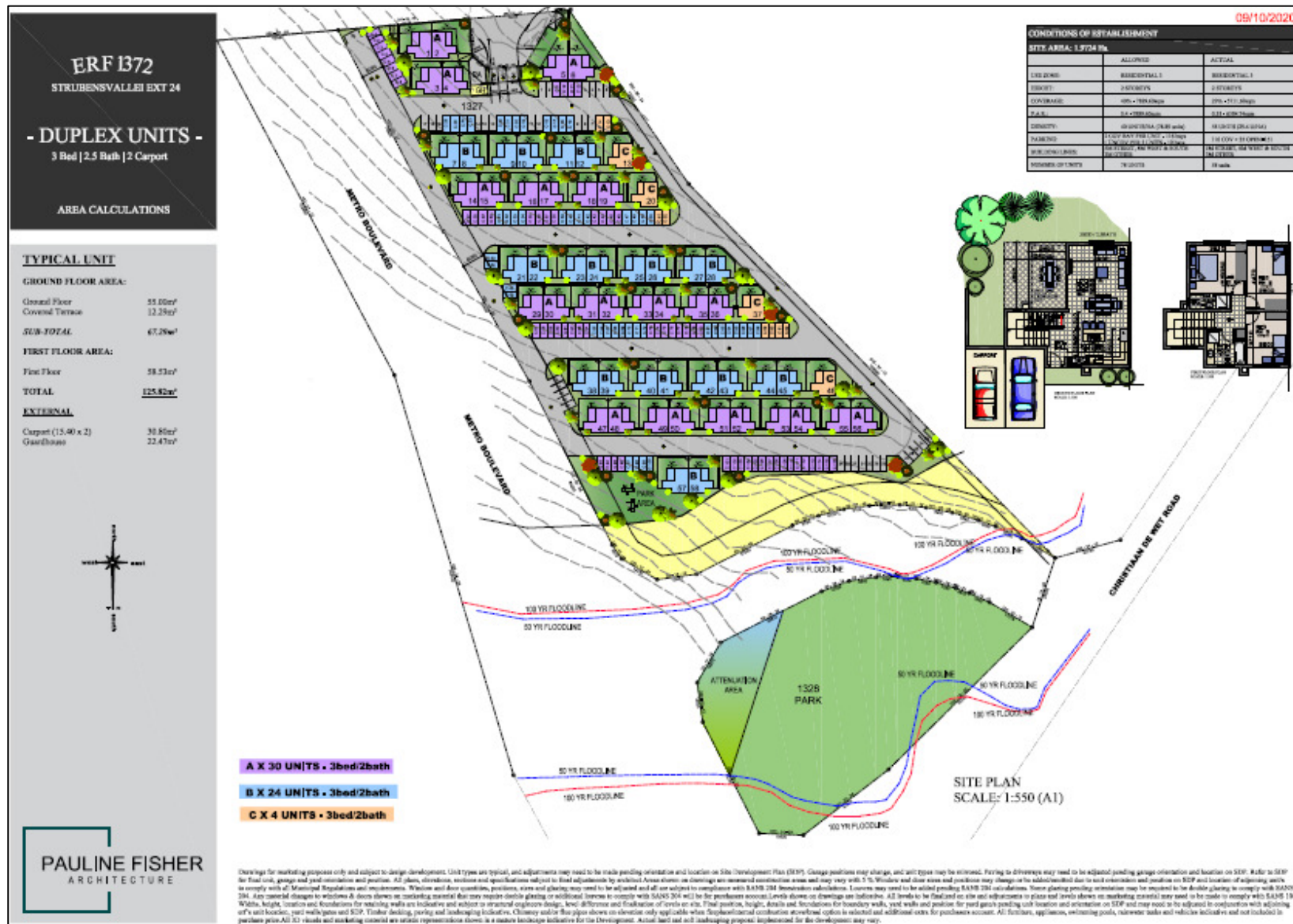


Figure 7-2: Alternative 1

8 ENVIRONMENTAL IMPACT STATEMENT

The proposed Strubensvallei Ext. 24 will involve the development of Erf 1327 and Erf 1328. The following rights are applicable to Erf 1327:

- Zoning Residential 3
- Site Area 1.9724 ha
- Height 3 Storeys (with council consent)
- Coverage 40%
- Floor Area Ratio (FAR) 0.4
- Density 40 units per hectare
- Number of units 72 units
- Number of Parking Bays 166 parking bays
- Refuse Area Details 41 m²

Erf 1328 will not be developed but will remain public open space.

The site is affected by the future Metro Boulevard planned by the Johannesburg Roads Agency which is excluded from the project footprint. Necessary access, internal roads and services will also be put in place as follows:

- Water Services - A new 110 mm diameter mPVC pipe (SANS 1283) will be put in place within the new access road and will connect to this existing pipe. The length of this connection is approximately 180m.
- Sewer Services - A new 160mm-diameter uPVC CL 400 H/D pipe will connect into the existing sewer system by means of a new manhole. This new connection pipeline is approximately 51m in length.
- Stormwater services - An internal stormwater reticulation system will be put in place and will utilize 160mm and 300mm pipes to direct stormwater to 300mm and 375mm OGEE pipe which will run down the eastern side of the development and lead to a stormwater attenuation pond which will be approximately 231 m² in extent. From there, a 450mm OGEE pipe will discharge water under the proposed Metro boulevard into Erf 1348. The length of this pipe is approximately 79m.
- Access - The site access will be provided from the cul-de-sac intersecting with Fiddle Avenue. As part of the development, this new cul-de-sac and new section of surfaced road extending to the existing Fiddle Avenue road surface will be constructed to council standards and handed over to council upon completion and acceptance of the road infrastructure. This road will include one inbound lane with a minimum width of 3.0m and one outbound lane with a minimum width 4.5m. A 2m paved sidewalk along the northern side of the cul-de-sac will also be provided.

The proposal involves of 72 “Residential 3” units as well as the necessary attenuation outside the wetland and wetland buffer area. Two play areas are also provided (at the entrance of the development and along the south-eastern boundary). Most importantly, this layout includes a 15m buffer area which was requested

by the City of Johannesburg. In contrast with the alternative, the proposal limits the impact to the wetland the development footprint (save for the sewer connection and stormwater pipe) is within Erf 1327 and does not encroach on the wetland or wetland buffer area. This reduces impacts to wetland interflows. It also reduces potential water quality issues. Lastly, the proposal does not encroach on the Zone 2 of the GPEMF whilst the alternative does. The proposal therefore reduces the impact to the Zone 2 area.

Based on the findings of the specialist studies and impact assessment and taking into account the successful implementation of the EMPr, it is felt that the **Proposal should be authorised**. The reasons for this opinion are discussed in more detail in the following subsections:

8.1.1.1 Need for the Project

In terms of the need and desirability of the project, it should be noted that the proposed development will further the objectives of the Region C Regional Spatial Development Plan (RSDF) by supporting the development, infill and densification of Sub Area 7 within the Urban Development Boundary (UDB) (Intervention 1 of Development Objective 1). This includes the following guidelines:

- Support residential densities of between 40-60 dwelling units/ha to promote infill; and
- Development within the Urban Development Boundary”

The proposed development occurs within the UDB and has a density of 40 units per hectare. It is therefore in line with the RSDF.

The development also occurs within the Consolidation Zone within the City of Johannesburg Spatial Development Framework 2040. According to the SDF, this area must be the focus of urban consolidation, infrastructure maintenance, controlled growth, urban management, addressing backlogs (in social and hard infrastructure) and structural positioning for medium to longer term growth. The policy intent in these areas would be to ensure existing and future development proposals are aligned as far as possible with the broader intent of the SDF, specifically in terms of consolidating and diversifying development around existing activity nodes and public transport infrastructure. In this broad area, new development that does not require bulk infrastructure upgrades should be supported. The proposed Strubensvallei Extension 24 development, does not require bulk infrastructure upgrades and is thus in line with the objectives for the consolidation zone.

Lastly, the development footprint of proposed development falls within Zone 1: Urban Development Boundary (UDB) of the Gauteng Provincial Environmental Management Framework (GPEMF). The intention of this zone is “to streamline urban development activities in it and to promote development infill, densification and concentration of urban development within the urban development zones as defined in the COJ Spatial Development Framework (GSDF), in order to establish a more effective and efficient city region that will minimise urban sprawl into rural areas.” The proposed development is therefore in line with the GPEMF. Whilst Erf 1328 falls within Zone 2 of the GPEMF, this erf will be zoned as Public Open Space and will not be developed.

Lastly the proposed development will provide numerous economic benefits. Firstly, during construction, there will be a direct CAPEX of R80 million. Secondly, 347 construction related employment opportunities will be created. During operation, 35 permanent positions will be created. This will also have several economic multiplier effects for the local economy.

8.1.1.2 Sensitivity

In order to better understand the environmental sensitivity and the potential impacts related to the development a wetland assessment was undertaken and found that development site is not directly affected by the wetland, but a wetland occurs to the south of the development footprint. In addition, the infrastructure installations and connections to the external services will impact on this wetland.

The Wetland specialist found that the Wetland identified is highly transformed and impacted by historical and ongoing anthropogenic activities. The Present Ecological Status (PES) for the wetland scored in the mid-range for the Unchanneled Valley Bottom Wetland. The Ecological Importance and Sensitivity (EIS) falls in the mid-range and has minimal functionality in respect of bio-diversity conservation. The Recommended Ecological Category (REC) for the wetlands were categorised as moderate. It will thus require some rehabilitation to enhance the ecological function of the system. The wetland is not considered to be sensitive and of any major importance.

It must also be noted that the wetland will in all likelihood be majorly impacted by the proposed Metro Boulevard Interchanges that is planned to cross over this section of the wetland. The wetland (SV24) is a small-scale wetland unit that interconnects to a larger wetland system to the west. The wetland (SV24) was also historically impacted by old farming activities and more recently by the construction of Christiaan DeWet Drive and associated stormwater infrastructure.

Be that as it may, it was still suggested that a 15m buffer on the current wetland be accommodated to buffer the development from the wetland. The buffer will suffice in the required management of the development impacts and continuation and maintenance of the wetland drivers. This conservation buffer should be utilised as the control area and will be adequate to assist with management and mitigation during the construction and operation phase. The specialist therefore concluded that the development may go-ahead if the required buffers are maintained and the resource drivers preserved by well-constructed stormwater infrastructure for the Township development. In respect of the construction phase, it is important to ensure that the required erosion protection measures linked to the intersecting sections be carefully designed and installed. It is further important to carefully design the storm water outlet structures to assist with dispersed flow release into the wetland. This should be designed to mimic the natural sheet flow into the wetland and avoid concentrated flow patterns into the wetland area.

A Hydropedological Assessment was also undertaken and found that the site is hydropedologically complex, yet once the extent and location of various processes and expressions (flowpaths and storage mechanisms express, naturally) is understood, appropriate mitigative actions can be taken to divert the

functionality to be in functionality with the imposed arbitrary development. Due to the nature of the site, the specialists recommended that suitable infill for benching be afforded, primarily as the site holds the entire hillslope (via the plug) in balance. The infilling of suitable materials will provide for the increased capacity of the site to mitigate future envisaged developments along the bottom of the site (i.e. the construction of the Metro Boulevard and intersection with Christiaan de Wet Road), simultaneously allowing for minimal destruction of the existing hillslope 'plug'. Where shallow interflow is dominated by deep interflow (Unit 4, Figure 6 9), a separate/unique mitigation must be afforded. The implicit flowpath is of high flux and reduction value, relative to the surrounding soils (Unit 4, Figure 6 9). The following was therefore recommended:

- Onsite consultation with hydrogeologist prior and during services installation
- Onsite consultation with hydrogeologist prior and during cut and fill design (levels to be determined)
- Bedrock was not encountered during the survey. (Geo-tech report also corroborates same). Soil rock interface was not encountered due to limitation of the use of TLB machinery. Hand auguring was not permissible due to the hardness of the material. It is thus recommended that a mechanical (drill type) investigation be conducted to confirm bedrock conditions.
- The topological backslope area (Unit 4, Figure 6 9) should be further investigated in terms of the annual duration of saturation as factor for the reduction i.e. maturation of the soil (gleying).
- It should be attempted to enhance the current wetland function.
 - Wetland drivers should be maintained as far as possible.
 - Water quality preservation is key

8.1.1.3 Impact Assessment

A detailed impact assessment has been undertaken and assessed the types of impact, duration of impacts, likelihood of potential impacts as well as the overall significance of the impact occurring (Appendix I of the BAR). Most impacts have a low significance once mitigation measures were applied. The following can be noted in regards to surface water/wetlands:

- The proposed development occurs within close proximity (although only the wetland buffer occurs within the main development footprint. Service infrastructure however will cross the wetland and associated 15m buffer.
- In terms of impacts, with the proposal, during construction, impacts to water quality, flow, habitat, biota and geomorphology were assessed to be of a low to low-medium significance prior to mitigation and a low significance, with the implementation of necessary mitigation measures including strict adherence to the delineated wetland and buffer other than authorised activities as well as the rehabilitation of the wetland as recommended by the Wetland Specialist.
- During operation, the impacts were assessed to be of low significance and the implementation of a proper stormwater management plan will ensure reduced impacts. In all cases, the proposal reduces the impact to the wetland as it limits the construction activities within the wetland.

Based on the impact assessment undertaken as well as the findings of the specialist studies and the need for the project, it is the opinion of the EAP, that the impacts related to the proposed development can be satisfactorily mitigated and that the Proposal be approved.

In addition, to the above impact statement, a risk matrix in terms of the GN 509 of 2016 has been compiled to better understand the risks associated with the proposed development. However as discussed previously, due to the fact that sewer activities are included the GA is not applicable. Activities related to the mixed-use development are rated as low however those related to the development of the road and sewer within the wetland have a moderate risk. A summary is provided in Table 8-1 below and the full risk assessment in **Annexure 11.17**.

Table 8-1: Risk Matrix summary

No.	Section 21 water uses	Phases	Activity	Aspect	Impact	Significance	Risk Rating	Confidence level	PES of Watercourse	EIS of Watercourse
1	(c) and (i)	Construction	Construction of Residential Development and internal services within 500m of a wetland	Clearing of vegetation and general construction works within 500m of a wetland	Loss of biodiversity and habitat	52	L	70	C - Moderately modified	Moderate
					Siltation	55.25	L	70	C - Moderately modified	Moderate
					Erosion	42.25	L	70	C - Moderately modified	Moderate
					Increased turbidity	45.5	L	70	C - Moderately modified	Moderate
					Flow modification	55.25	L	70	C - Moderately modified	Moderate
					Geology and Soils, impact on topography and loss of top soil.	55.25	L	70	C - Moderately modified	Moderate
2	(c) and (i)	Construction	Construction vehicles and equipment on site.	Waste water discharge from hydrocarbon spills within 500m of a wetland	Water quality issues	45.5	L	70	C - Moderately modified	Moderate
4	(c) and (i)	Construction	Construction vehicles and equipment on site for the construction of Services	Waste water discharge from hydrocarbon spills within wetland	Water quality issues	150	M	70	C - Moderately modified	Moderate

No.	Section 21 water uses	Phases	Activity	Aspect	Impact	Significance	Risk Rating	Confidence level	PES of Watercourse	EIS of Watercourse
5	(c) and (i)	Construction	Concrete mixing for services	Waste water discharge from concrete mixing within wetland	Water quality issues	150	M	70	C - Moderately modified	Moderate
6	(c) and (i)	Construction	Construction of stormwater pipeline and sewer line within the wetland	Clearing of vegetation, excavations and general construction works within wetland	Loss of biodiversity and habitat	150	M	70	C - Moderately modified	Moderate
					Siltation	150	M	70	C - Moderately modified	Moderate
					Erosion	150	M	70	C - Moderately modified	Moderate
					Increased turbidity	150	M	70	C - Moderately modified	Moderate
					Flow modification	150	M	70	C - Moderately modified	Moderate
					Geology and Soils, impact on topography and loss of top soil.	150	M	70	C - Moderately modified	Moderate
7	(c) and (i)	Operation	Routine maintenance of development as and when required.	Maintenance of mixed use development, stormwater attenuation and associated services	Siltation	24	L	70	C - Moderately modified	Moderate
					Erosion	24	L	70	C - Moderately modified	Moderate
					Increased turbidity	24	L	70	C - Moderately modified	Moderate
					Flow modification	24	L	70	C - Moderately modified	Moderate
8	(c) and (i)	Operation	Management of stormwater within Development	Increased stormwater due to development	Siltation	42.75	L	70	C - Moderately modified	Moderate
					Change to hydrological regime and increased potential for erosion	45	L	70	C - Moderately modified	Moderate

No.	Section 21 water uses	Phases	Activity	Aspect	Impact	Significance	Risk Rating	Confidence level	PES of Watercourse	EIS of Watercourse
					Increased turbidity	40.5	L	70	C - Moderately modified	Moderate
					Flow modification	45	L	70	C - Moderately modified	Moderate
					Diversion and increased velocity of surface water	45	L	70	C - Moderately modified	Moderate
9	(c) and (i)	Operation	Maintenance of sewer line	General maintenance works within wetland (including potential spills)	Siltation	104	M	70	C - Moderately modified	Moderate
					Change to hydrological regime and increased potential for erosion	104	M	70	C - Moderately modified	Moderate
					Increased turbidity	104	M	70	C - Moderately modified	Moderate
					Flow modification	104	M	70	C - Moderately modified	Moderate

9 PUBLIC PARTICIPATION

Public Participation has been conducted in line with the Regulations regarding the Procedural Requirements for Water Use License Applications and Appeals (R. 267 of 24 March 2017). All public participation has been integrated with the Basic Assessment Report. A public participation report has been compiled and is included in **Annexure 11.7**.

10 CONCLUSION AND RECOMMENDED CONDITIONS FOR INCLUSION IN THE WUL

Based on the mitigation measures included in the EMPr, Monitoring Plan and Rehabilitation Plan, it is the recommendation of the EAP that the WUL for the proposed development be authorised. The following recommendations accompany this recommendation:

- Monitoring should be undertaken as per the requirements of the Monitoring Plan and should include the following:
 - Wetland Assessment:
 - 1 Post construction assessment
 - ECO Site Inspections
 - Preconstruction Phase – Once
 - Construction Phase – Weekly inspections and monthly reporting
 - Post construction - Once
 - Water Use Licence Compliance Audits
 - As per the WUL Requirements (recommended annual)
 - Rehabilitation Audit
 - 1 audit to be undertaken during each phase (pre-construction, construction and post construction).
- Rehabilitation of impacted areas must be undertaken as per the requirements of the Rehabilitation Plan. In particular, the following should be undertaken:
 - Rehabilitation must be carefully sited to minimize the footprint and the loss of the natural habitat within the aquatic resource areas during the construction phase;
 - The sensitive areas and buffer zones/flood line areas must be demarcated and strictly adhered to;
 - Re-vegetation of disturbed areas must be undertaken with site-specific indigenous species and in accordance with the instructions issued by the ECO/Aquatic Specialist;
 - Trenches must be backfilled and re-vegetated as described in this Rehabilitation Plan.
 - Stormwater should not discharge perpendicularly to the aquatic resource, but rather as parallel as possible to reduce impacts to the stream flow and the opposite bank.
 - Additionally, breakers should be incorporated at the discharge points to reduce the velocity of stormwater entering the aquatic resource.
 - This Rehabilitation Plan has included the planting of indigenous vegetation that would function ecologically and in attenuating stormwater flow.
 - Consultation with Mr. D. Botha from Prism EMS along with other relevant experts regarding the proper disposal methods or use of the removed sediment is imperative; and

- The environmental impacts of the construction must be closely monitored in terms of both the upstream and downstream environment with regards to sediments loads & plumes, water flows and pollution build up (plastics, polystyrene, etc).
- Construction must be undertaken in line with the requirements of the WUL, EA and EMPr.
- The Licensee must conduct an annual internal audit on compliance with the conditions of license. A report on the audit shall be submitted to the Provincial Head within one month of the finalization of the audit.
- The Licensee must appoint an independent external auditor to conduct an annual audit on compliance with the conditions of this license. The first audit must be conducted within 6 (six) months from the date of commencement of construction activities on site. The report on the audit shall be submitted to the Provincial Head within one month of finalization of the report.
- The Licensee shall notify the Department of the commencement of activities.
- Any incident that causes or may cause water pollution must be reported to the Provincial Head or his/her designated representative within 24 hours.

11 ANNEXURES

11.1 Curriculum Vitae of Assessor and Specialists

To prevent duplication, please refer to Appendix I of the Basic Assessment Report

11.2 Procedural Requirements

This will be included in the Final WULA once the necessary submissions have been made on EWULAAS.

11.2.1 Pre-Application Enquiry

11.2.2 Pre-application meeting attendance register

11.2.3 Confirmation of WUL process and opening of Phase 1

11.3 Specialist Studies

To prevent duplication, please refer to Appendix G of the Basic Assessment Report

11.3.1 Wetland Assessment

11.3.2 Geotechnical Assessment

11.3.3 Hydropedological Assessment

11.4 Mapping

To prevent duplication, please refer to Appendix A of the Basic Assessment Report

11.5 Masterplan

To prevent duplication, please refer to Appendix A of the Basic Assessment Report

11.6 Site Photographs

To prevent duplication, please refer to Appendix B of the Basic Assessment Report

11.7 Public Participation Report

To prevent duplication, please refer to Appendix E of the Basic Assessment Report

11.8 Environmental Management Programme

To prevent duplication, please refer to Appendix H of the Basic Assessment Report

11.9 Rehabilitation Plan

11.10 Monitoring Plan

11.11 Construction Methodology/Method Statement

11.12 Construction Management Plan

11.13 Civil Reports and Designs

11.14 Section 27 Motivation

11.15 Stormwater Report

11.16 Basic Assessment Report

The WULA technical report forms part of the Basic Assessment Report which is made available for public review. The Basic Assessment Report is therefore not included here to prevent duplication.

11.17 Risk Matrix