

Draft Basic Assessment Report

Eldorette Extension 54

Gaut 002/18-19/E0099

October 2018

Executive Summary



TEXTURE
ENVIRONMENTAL CONSULTANTS



Executive Summary

1 INTRODUCTION

Cosyspro (Pty) Ltd (the applicant) appointed Texture Environmental Consultants as the independent Environmental Assessment Practitioner (EAP) to undertake the Environmental Impact Assessment (EIA) for the proposed development of Eldorette Extension 54.

An application for environmental authorisation was submitted to the Gauteng Department of Agriculture and Rural Development (GDARD). The GDARD requires a Basic Assessment for this project. The Basic Assessment will conform to the National Environmental Management Act 107 of 1998 and to the Environmental Impact Assessment Regulations as amended. The Basic Assessment will provide information about the proposed Eldorette Extension 54, and its scope is restricted to this component of the project.

The study site is located on Holding 42 in the Heatherdale Agricultural Holdings, on the corner of Main street and First Avenue, on the northern side of Akasia High School in the City of Tshwane Metropolitan Municipality, Gauteng Province. The property measures some 2.1883 hectares in total size.

2 APPROACH TO THE BASIC ASSESSMENT PROCESS

The approach followed by the consultants is based on the specifications for the Basic Assessment Report in terms of the Environmental Impact Assessment Regulations, 2014, promulgated in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended.

Gauteng Provincial Department of Agriculture and Rural Development, is the lead authority for this Environmental Impact Assessment (EIA) process and the development needs to be authorised by this Department in accordance with the National Environmental Management Act 107 of 1998 (NEMA) (as amended).

To ensure that all requirements and processes in terms of the Acts are followed the following tasks need to be conducted:

The following has to be submitted to the GDARD:

- ✓ Application form for Authorisation
- ✓ Draft Basic Assessment Report
- ✓ Environmental Management Programme (EMPr)
- ✓ Final Basic Assessment Report

The environmental authority will review the Application and final Basic Assessment Report and the following decisions may be made:

- ✓ Grant authorisation of the activity
- ✓ Refuse the activity
- ✓ Request further information or investigations
- ✓ Refer the application to a scoping process where substantial additional investigations or assessments are required in order to make a decision.

3 PROJECT LOCALITY

The study site is located on Holding 42, Heatherdale Agricultural Holdings. The subject property falls in the jurisdictional area of the City of Tshwane Metropolitan Municipality (CTMM) and forms part of Planning Region 1 and Ward 98.

Heatherdale Agricultural Holdings which the subject property forms part of is positioned to the north of Brits Road (K14) / Rachel de Beer Street, to the east of the R80 / Mabopane Highway (PWV 9) and to the south of the N4 Platinum Highway (PWV 2). The R80 / Mabopane Highway (PWV 9) runs north-south through the Akasia area affectively dissecting the larger area into an eastern and western portion.

First Avenue together with Brits Road (K14) / Rachel de Beer Street, provides linkages over the R80 / Mabopane Highway (PWV 9) and can be viewed as important connector roads, linking the eastern and western portions of the larger Akasia area. The location of the both the R80 / Mabopane Highway (PWV 9) and the N4 Platinum Highway (PWV 2) also ensure that the subject property is well connected and easily accessible on a regional and local level. The proposed project is set out in the Location Map below.

Site Location

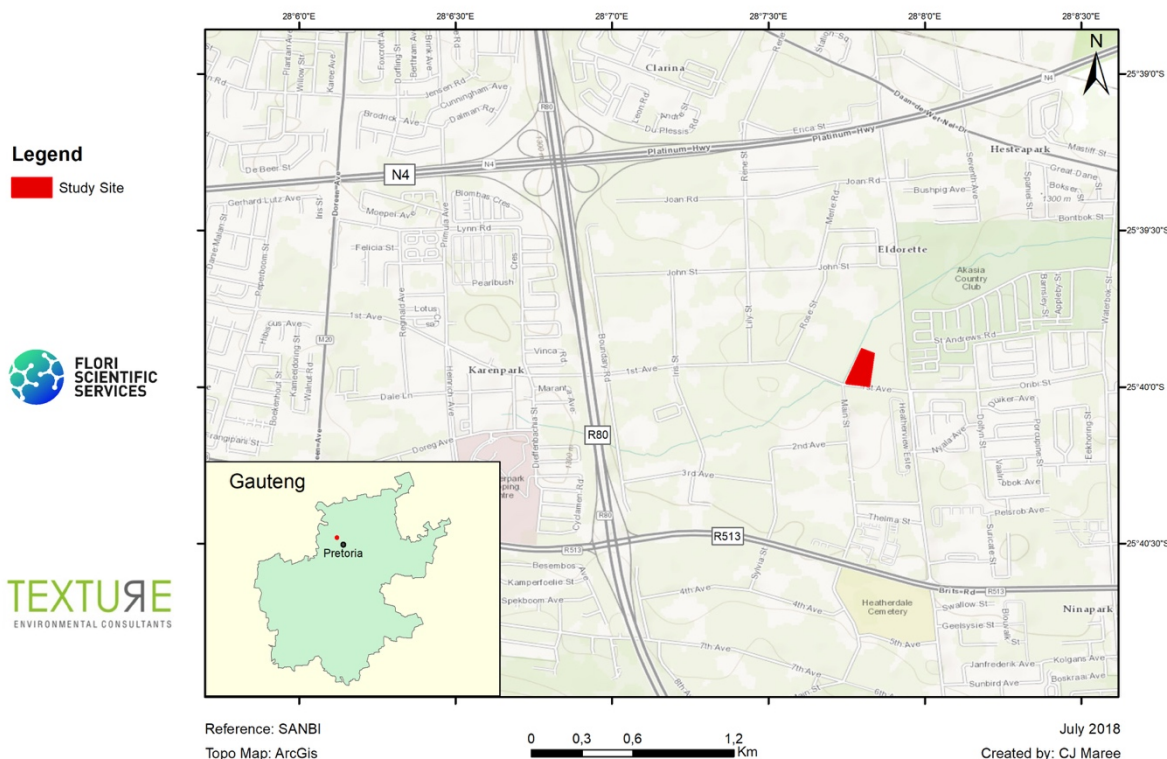


Figure 1: Site Location

The GPS coordinates of the main landmarks within the project area are as follows:

- Eldorette: 25° 39'34.05"S; 28° 7'49.87"E.
- Karenpark: 25° 39'43.93"S; 28° 6'49.62"E.
- Study site (Approximate centre point): 25° 39'56.73"S; 28° 7'47.86"E.
- 1:50 000 map grid references: 2528CA (2528CA18).

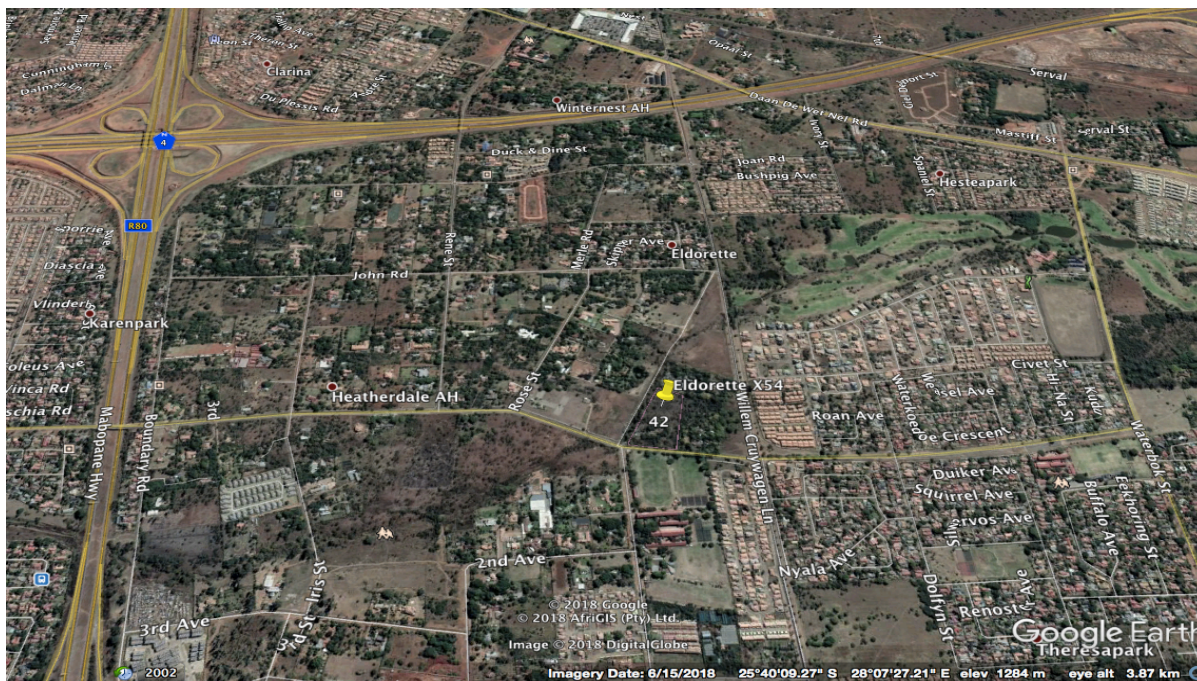


Figure 2: Study area location (Google Earth)

The site is bound by First Avenue to the south, Portion 778 of the farm Witfontein 301-JR and Holding 33 Heatherdale AH to the west, Holding 39 Heatherdale AH to the north and Holding 41 Heatherdale AH to the east.

A small, semi-perennial stream, the Boepensspruit, flows all along the western boundary of the study site, with some of the riparian vegetation within the edge of the site. The original flow and channel of the Boepensspruit (stream) has been altered. The floodplain of the stream is very wide south / southwest of the study site, but then gets channelled very narrowly into stormwater culverts that run under the road (1st Ave) and then stays in a deep, narrow channel all along the western boundary of the study site.



Figure 3: Study area location close-up (Google Earth)

4 PROPERTY DESCRIPTIONS

The proposed township to be known as Eldorette Extension 54 will be established on Holding 42, Heatherdale AH. The Surveyor-general 21-digit site (erf/farm/portion) reference number is T0JR0105000004200000.

The subject property is zoned “Agricultural” in terms of the provisions of the Tshwane Town Planning Scheme, 2008 (Revised 2014).

5 PROJECT DESCRIPTION

This environmental application is for the proposed Eldorette Extension 54 Township. The project involves the proposed construction of a residential township on a property of 2.1183 hectares. The proposed township will comprise of forty-seven (47) “Residential 1” zoned erven with a minimum erf size of 200m², a “Special” zoned erf for private roads, a “Public Open Space” erf and streets. The proposal includes the construction of associated infrastructure, including access road, civil services (water, sewer and stormwater reticulation) and electricity.

In addition to the environmental application, an application by Metroplan Town planners is made in terms of Section 16 (4) of the City of Tshwane Land Use Management By-law, 2016 and as required in terms of Schedule 6 to the said By-law for the establishment of Eldorette Extension 54 on Holding 42, Heatherdale Agricultural Holdings.

Herewith a summary of the respective land use categories proposed:

1. Erven 395 – 439, 448 and 449 constitutes forty-seven (47) erven which will be zoned “Residential 1”. The said erven measure a minimum of 200m² each and will permit the development of one (1) dwelling-house on site. Due to the extent of the properties, all proposed municipal services (water, sanitation, electricity and stormwater) traversing the properties were accommodated in servitudes areas. The said zoning will furthermore be ascribed to 1.1060ha of the township area and represents 52% of the township area;
2. Erf 450 will be zoned “Special” for private roads. This will enable access to the individual properties whilst allowing for the installation of municipal services and a security entrance to the development. The proposed erf measures about 0.5362ha in extent and covers approximately 25% of the township area;
3. Erf 451 will be zoned “Public Open Space” and accommodates the area affected by the floodline as well as a 32m regulated area for environmental purposes. The proposed erf measures about 0.4175ha in extent and covers approximately 20% of the township area; and
4. The remaining 0.0586ha of land will be zoned “Existing Streets” and will allow for the widening of Daphne Road (First Avenue) by 4.63m per the requirement of the ‘Tshwane Road Master Plan’.

The proposed development composition (i.e. zoning, land use, stand number, number of stands, extent etc.) is set out in the Table below as well as on the Township layout plan for Eldorette Extension 54.

Table 1: Proposed development controls

USE ZONE	PROPOSED USE ZONE	ERF NO	SIZE (HA)	HEIGHT	FAR	COV.	DENSITY	% of AREA
1	Residential 1	395 – 439, 448 & 449	1.1060	10m (2 storeys)	N/A	65 %	200m ² erven	52
28	Special for private road	450	0.5362	10m (2 storeys)	0,10	10 %	N/A	25
20	Public Open Space	451	0.4175	SDP	SDP	SDP	N/A	20
22	Existing Streets	-	0.0586	N/A	N/A	N/A	N/A	3

Access to the township will furthermore primarily be obtained via a single security-controlled entrance and exit point from Daphne Road (First Avenue). The access point will be twenty-meter (20m) in width, tapering down to a thirteen-meter (13m) road which will grant access to the individual residential erven. The internal road will be known as Pink Ivory Crescent. The proposed ‘public open space’ erf will obtain access directly from Daphne Road (First Avenue).

8 SITE AND SURROUNDING LAND USES

The present landcover of the region is predominantly medium-to high-density urbanisation in the form of housing and related infrastructure, such as roads, powerlines, etc.

The established neighbourhoods surrounding the Heatherdale Agricultural Holdings includes Eldorette, Theresapark, Heatherview, Amandasig and Karenpark. Most of the agricultural holdings however still serves a single residential function although several of the holdings is in the process of being developed as residential townships. Examples of nearby townships where construction has commenced, includes Eldorette Extension 51 situated immediately west of the subject property, on the northern side of First Avenue along Rose Street. Newly authorised townships are Eldorette X53 situated along First Avenue south-west of the subject property with Eldorette 34, Eldorette X42 and Eldorette X26 successively to the west of Eldorette X53.

The recognised 'Akasia nodal area', consisting of the Wonderpark Shopping, the Akasia Netcare Hospital and the surrounding business, is situated approximately 2 km west of the subject property. Other prominent land uses identified in a 2 km radius from the subject property includes amongst others (in a clock-wise direction):

- Akasia Golf Club;
- Thornbrook Golf Estate;
- Akasia High School;
- Theresapark Primary School;
- Hatfield Christian Church North,
- Heatherdale Cemetery;
- Akasia Town Hall;
- Akasia Municipal Office; and
- Wonderpark Estate.

The site itself is within the mentioned Heatherdale agricultural holding (A.H.) area that is becoming more and more urbanised, but was previously cultivated on a regular basis. The study site does not appear to have been historically cultivated or even grazed with cattle on any significant level. There is no pristine Marikana thornveld vegetation present on the study site.

The vegetation of the study area is a mix of transformed areas (near and around the dwellings); degraded thornveld (in areas of exotic trees); and moderately degraded thornveld (northern section of the study site). The open, thornveld area in the north of the study site is characteristic of Marikana Thornveld, with Acacia thorn trees being prominent in the landscape.

A small, semi-perennial stream, the Boepensspruit, flows all along the western boundary of the study site, with some of the riparian vegetation been within the edge of the site. The original flow and channel of the Boepensspruit (stream) has been altered. The floodplain of the stream is very wide south / southwest of the study site, but then gets channelled very narrowly into stormwater culverts that run under the road (1st Ave) and then stays in a deep, narrow channel all along the western boundary of the study site

The landcover or landuse of the study site is a mix of dwellings (houses), gardens, exotic trees and lawns in the southern section and open thornveld in the northern section.

9 NEED AND DESIRABILITY

Residential developments at an increase density have become a growing trend in South African cities. This is as a result of the public and private sectors' efforts to address fragmented cities as a consequence of the country's history, as well as accommodating the growing population. With land being a scarce resource in our country, it is also pivotal to make optimal use of urban land in the form of densification.

Further to the above, the demand for higher density developments, in comparison to conventional single dwelling houses, can be substantiated by the benefits that come with densification. Higher density developments promote a sustainable city in the long term because they make optimal use of limited resources such as land, open space areas, social facilities and existing services infrastructure. Densification within proximity to economic centres, social amenities and public transport facilities, also promotes access to job opportunities and ensures the social well-being of the population. The densification of well-located properties also contributes to the reduction of the ecological footprint because of shortened travel distances. In contrast, low density developments threaten the sustainability

of the city through loss of valuable agricultural land on the urban edges and growing urban sprawl, resulting in more expensive modes of transport.

Considering the above, it is evident that densification within urban areas is needed to ensure a sustainable city in the long term. In addition, the Spatial Development Framework for Region 1, 2013 demarcates the subject property into a 'mixed use zone' and 'linear zone' where densities of up to 80 dwelling-units per hectare are generally encouraged. Based on the said provision, the proposed density of 50 units per hectare (viz. minimum erf size of 200m²) is considered in line with the provisions of the RSDF and can therefore be supported. The proposed density also does not deviate from the general residential character of the area since a substantial amount of the surrounding properties has either been subdivided into two (2) or more portions or forms part of a township establishment process. Considering the changing nature of the surrounding area viz. conversion of agriculture holdings to higher density residential developments, the proposed residential development is expected to complement and enhance the emerging character of the area.

Having taken all the relevant factors into account, it is the applicant's submission that the proposed development is desirable in terms of the following:

- The existing buildings located on the subject property will be demolished;
- The location of both the R80 Mabopane Highway (PWV 9) and the N4 Platinum Highway (PWV 2) in proximity to the subject property ensure that the development will be well connected and easily accessible on a regional and local level;
- The proposed densification of the subject property is in line with the principles enshrined in the mentioned local, provincial and national development policies and frameworks;
- The densification and compaction of the area by means of the proposed development will have the following advantages:
 - a. A more compact urban form that discourages dispersed urban sprawl; and
 - b. The provision of a wider range of housing typologies in the area under discussion
- The proposed development is situated in an established urban area where economic and social amenities are readily available such as; the Akasia Golf Club, the Akasia High School, Theresapark Primary School, Heatherdale Cemetery, the Wonderpark Shopping Centre, the Akasia Netcare Hospital, the Akasia Town Hall and the Akasia Municipal Office
- The proposed land use remains residential and is considered compatible with the surrounding uses.
- Parking can be provided on-site at the parking ratio imposed by the Tshwane Town-planning Scheme, 2008 (Revised 2014).

In view of the above it is the applicant's opinion that the proposed Township Establishment is desirable and will not have a detrimental impact on the surrounding properties or the environment.

10 LEGAL REQUIREMENTS

10.1 National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA)

In terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) as amended and the EIA Regulations 2014, an application for environmental authorisation for certain listed activities must be submitted to the relevant authority, the Gauteng Department of Agriculture and Rural Development (GDARD).

A Basic Assessment (BA) process for this proposed project is being undertaken by Texture Environmental. The listed activities for the proposed Eldorette X54 are the following:

Table 2: Listed Activities

Listed Activity	Activity/ Project Description
<p><u>Listing Notice 1 Activity 19</u> The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse.</p>	<p>To make provision for the excavation or infilling of more than 10 cubic metres of soil from a watercourse if required. Infilling and / or excavation within the 1:100 year flood lines will have to be done to construct civil services in the 1:100 year flood line areas.</p>
<p><u>Listing Notice 1 Activity 27</u> The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for – (i) the undertaking of a linear activity; or</p>	<p>The construction of the proposed development will entail the clearance of more that 1 hectares of indigenous vegetation, but less than 20 hectares. The impacted study area is 2,1183 ha</p>

<p>(ii) maintenance purposes undertaken in accordance with a maintenance management plan.</p>	<p>of which 0,4175 ha will be zoned as private open space and maintained as park area. As a result, approximately 1,7008 hectares of indigenous vegetation will thus be cleared.</p>
<p><u>Listing Notice 3 Activity 4</u> The development of a road wider than 4 metres with a reserve less than 13,5 metres. <u>c. Gauteng</u></p> <ul style="list-style-type: none"> (i) A protected area identified in terms of NEMPAA, excluding conservancies; (ii) National Protected Area Expansion Strategy Focus Areas; (iii) Gauteng Protected Area Expansion Priority Areas; (iv) Sites identified as Critical Biodiversity Areas (CBAs) or Ecological Support Areas (ESAs) in the Gauteng Conservation Plan or in bioregional plans; (v) Sites identified within threatened ecosystems listed in terms of the National Environmental Management Act: Biodiversity Act (Act No. 10 of 2004); (vi) Sensitive areas identified in an environmental management framework adopted by the relevant environmental authority; (vii) Sites identified as high potential agricultural land in terms of Gauteng Agricultural Potential Atlas; (viii) Important Bird and Biodiversity Area (IBA); (ix) Sites or areas identified in terms of an international convention; (x) Sites managed as protected areas by provincial authorities, or declared as nature reserves in terms of the Nature Conservation Ordinance (Ordinance 12 of 1983) or the NEMPAA; (xi) Sites designated as nature reserves in terms of municipal Spatial Development Frameworks; or (xii) Sites zoned for conservation use or public open space or equivalent zoning. 	<p>According to the Gauteng Conservation Plan (C-Plan) version 3.3, the study area is outside of Critical Biodiversity Areas (CBAs), but borders on an Ecological Support Area (ESA). The demarcated ESA is the small stream that flows southwest and west of the study area.</p> <p>Access to the development will be from the existing First Avenue on the southern boundary of the site. The access road will be 20 metres wide.</p>
<p><u>Listing Notice 3 Activity 12</u> The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan <u>c. Gauteng</u></p> <ul style="list-style-type: none"> (i) Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004; (ii) Within Critical Biodiversity Areas or Ecological Support Areas identified in the Gauteng Conservation Plan or bioregional plans; or (iii) On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning. 	<p>According to the Gauteng Conservation Plan (C-Plan) version 3.3, the study borders on an Ecological Support Area (ESA).</p>
<p><u>Listing Notice 3 Activity 14</u> The development of—</p> <ul style="list-style-type: none"> (i) dams or weirs, where the dam or weir, including infrastructure and water surface area exceeds 10 square metres; or (ii) infrastructure or structures with a physical footprint of 10 square metres or more; <p>where such development occurs—</p> <ul style="list-style-type: none"> (a) within a watercourse; (b) in front of a development setback; or (c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse; <p>excluding the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour. <u>c. Gauteng</u></p> <ul style="list-style-type: none"> i. A protected area identified in terms of NEMPAA, excluding conservancies; ii. National Protected Area Expansion Strategy Focus Areas; iii. Gauteng Protected Area Expansion Priority Areas; iv. Sites identified as Critical Biodiversity Areas (CBAs) or Ecological Support Areas (ESAs) in the Gauteng Conservation Plan or in bioregional plans; v. Sites identified within threatened ecosystems listed in terms of the National Environmental Management Act: Biodiversity Act (Act No. 10 of 2004); vi. Sensitive areas identified in an environmental management framework adopted by the relevant environmental authority; vii. Sites or areas identified in terms of an international convention; viii. Sites managed as protected areas by provincial authorities, or declared as nature reserves in terms of the Nature Conservation Ordinance (Ordinance 12 of 1983) or the NEMPAA; ix. Sites designated as nature reserves in terms of municipal Spatial Development Frameworks; or x. Sites zoned for conservation use or public open space or equivalent zoning. 	<p>Infrastructure or structures with a physical footprint of 10 square metres or more will be constructed within 32 metres of the 1:100 year flood line area.</p>

10.2 National Water Act, 1998, Act 36 of 1998

The National Water Act, 1998 (Act 36 of 1998) as amended (Act) defines certain environmental elements, such as a “watercourse” (which includes the 1:100 year flood line, riparian areas, wetlands, and including the area 500 meters from a delineated wetland) as part of the watercourse and is the area which is regulated by the Act. It also states that any act or omission, which pollutes or is likely to pollute a water resource is an offence, including the management of waste must be considered during the environmental authorisation process.

A water use authorization in terms of Section 22 of the National Water Act, 1998 (Act 36 of 1998) as amended, will have to be applied for in terms of Section 40 of the Act or the General Notice 509, Government Gazette 40229, dated 26 August 2016 for the water uses related to any activity within watercourse.

A Water Use License (WUL) or General Authorisation (GA) will be required for water uses as defined for the impeding or diverting of the flow of water in and altering the bed, banks and or characteristics of a watercourse in terms of Section 21 (c) and (i) of the Act. Activities such as the attenuation and release of storm water, sewage wastewater reticulation systems, water supply networks, (any services infrastructure), or roads (to be confirmed), electrical supply, any buildings, fences and or any other activity within a watercourse will have to be addressed in such an application.

The Act (and as defined by GN 509) requires that the 1:50 and 1:100 year flood line, riparian areas, wetlands, and the area 500 meters around a wetland be delineated on all the development drawings that are being submitted for approval.

Implications for development

The study area is within a watercourse. The proposed development will have an impact on the watercourse and is within the “regulated area” (watercourse) as defined by the Act and GN 509. GN 509 allows for a General Authorisation to be issued for “Low” (small-type) impacts for any type of development or activity. However, requires that a Water Use Licence Application (WULA) process must automatically be followed if a sewage wastewater pipeline is within the regulated area.

Therefore, for the construction, operation, maintenance and management for the controlled release of stormwater, including stormwater attenuation structures, sewage reticulation system, water supply network, electrical supply (needs to be confirmed), roads, any buildings (no new roads or buildings are within the regulated area), fences and or any other activity that is within the Boepensspruit (watercourse) as proposed for the development will require a Water Use License Application (WULA) in terms of the National Water Act.

11 FEASIBLE AND REASONABLE ALTERNATIVES

During investigations various alternatives were investigated. The best options will be determined through the environmental and specialist studies, as well as public opinion.

The following alternatives have been identified and are described as follows:

11.1 Layout Alternatives

The layout options were investigated in terms of the layout for the proposed establishment so as to accommodate the watercourse area. The property is impacted by flood lines as indicated and endorsed by the relevant engineer on the below Layout Plan. The flood line Assessment was conducted by SRK Consulting.

Preferred Layout

The sensitivity assessment takes a number of issues into consideration. These include the terrestrial and the aquatic ecology of the site and immediate surrounding area; the conservation status of the vegetation type in which the study site is situated, which in this case is endangered (EN); the presence of pristine veldtypes; the presence of red data fauna and flora species; and the presence of ideal habitats for priority species (which include, but are not limited to red data species), the presence of heritage resources etc.

According to the analyses of the floristic, faunal and overall ecological sensitivities there are no high sensitivity areas or habitats. In other words, there are no 'No-Go' areas within the study area. Even though the actual ecological sensitivity of the stream is calculated to be 'Medium'; the sensitivity should be raised to 'High', as watercourses are, by default, considered sensitive. This has been done in the final sensitivity map, where the watercourse (Boepensspruit) is demarcated as having a sensitivity rating of 'High'.

According to the Gauteng Conservation Plan (C-Plan) version 3.3, the study area is outside of any Critical Biodiversity Areas (CBAs), but borders on an Ecological Support Area (ESA). The demarcated ESA is the small, semi-perennial stream, the Boepensspruit that flows southwest and west of the study area. The Boepensspruit, a tributary of the Apies river, is just outside of the boundaries of the study area in the south, but flows just within the southeast corner.

The layout options were investigated in terms of the layout for the proposed establishment so as to accommodate the floodline area. The property is impacted by flood lines as indicated and endorsed by the relevant engineer on the Layout Plan. The floodline Assessment was conducted by SRK Consulting Civil Engineers.

According to the layout plans for the proposed development no development activities will take place within the stream, or riparian zone of the stream (most of which is situated outside of the study area). The 50-year and 100-year floodlines are also mostly outside of the actual study site. Only a small portion is within the south western border of the site. This small section is completely within the 32m regulated zone, which is recommended to be earmarked for 'Public open space' (green zone) as part of a positive impact from the proposed development.

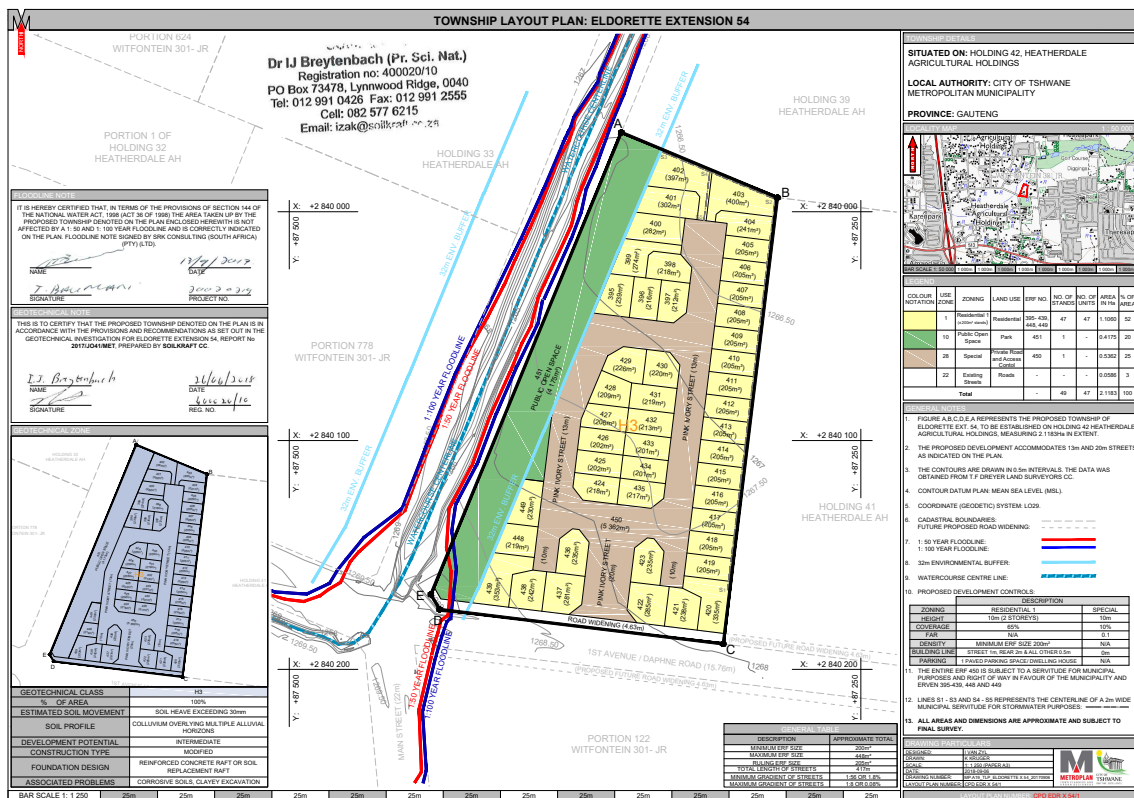


Figure 5: Preferred Layout

Layout Alternative 1

This layout Alternative was without consideration of the 32m regulated zone, which is recommended to be earmarked as a green zone, as part of a positive impact from the proposed development.

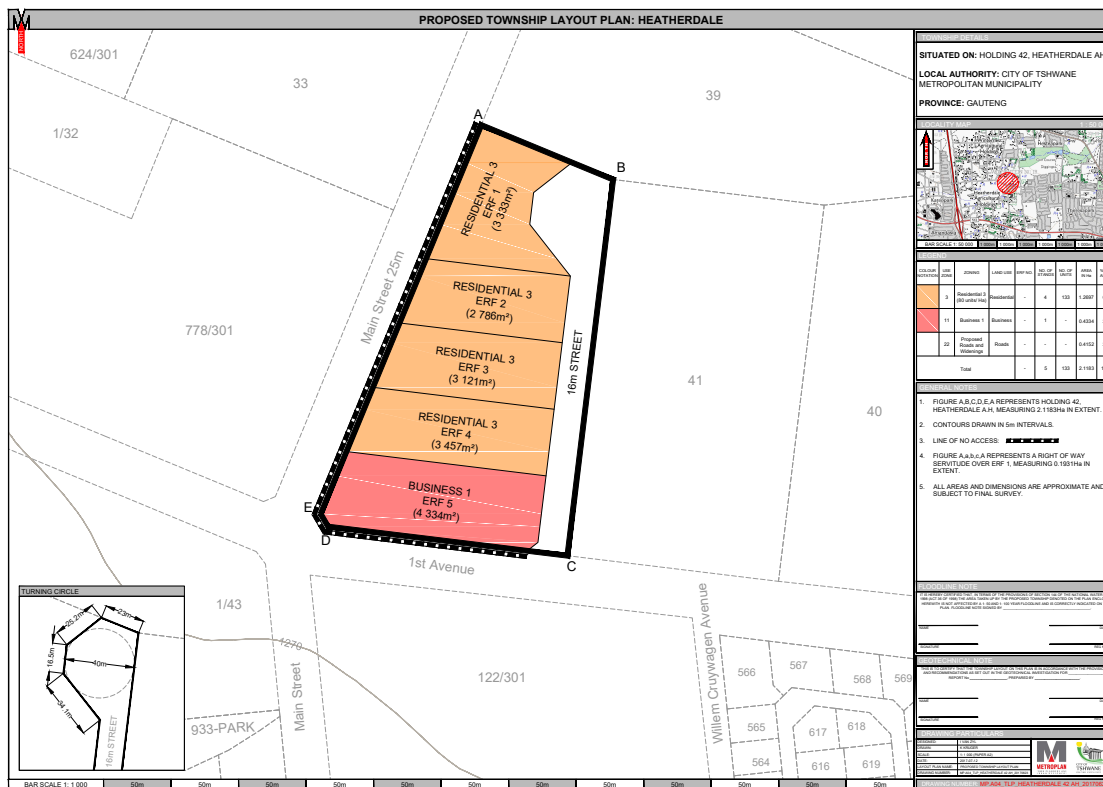


Figure 6: Layout Alternative 1

11.2 Activity alternative

The Metropolitan Spatial Development Framework (MSDF) and Regional Spatial Development framework (RSDF) for the 7 Administrative Regions of Tshwane takes the protection of prime and unique agricultural land into consideration as part of the responsibility to ensure food security in the Country. In terms of the content of the RSDF for Region 1 the subject property is not located in an area deemed prime agricultural land ('Rural') and therefore does not need to be protected.

Most of the surrounding properties are also zoned 'Agricultural' in terms of the Tshwane Town Planning Scheme, 2008 (Revised 2014). But as mentioned, several of the surrounding agricultural holdings is in the process of being developed as townships. Examples of township applications approved (not yet promulgated), in process (applications circulating at the Municipality) and townships reserved (applications not yet submitted) near the subject property, as derived from the City of Tshwane data base, includes:

- Township applications approved: Eldorette Extension 26, 28, 30, 32, 34, 42, 47, 51, 52 and Heatherview Extension 29;
- Township applications in process (submitted): Eldorette Extension 24, 35, 43, 46 and 53; and
- Township reserved (applications not yet submitted): Eldorette Extension 27, 33, 50 and 54.

In addition to the above, cultivation did not seem to have previously taken place on the study site. The agricultural potential of the study area in terms of crop production is low. This also is due to the lack of existing surrounding potential agricultural land.

The study area is too small to have any meaningful carrying capacity for cattle and grazing. The further lack of surrounding potential pastures is also a further limiting aspect on the farming potential of the study site in terms of cattle production or grazing. The agricultural potential in terms of cattle farming is therefore 'low potential grazing land'.

In summary, the study area as a single unit has medium/low agricultural potential. Agriculture could therefore not be considered as an alternative for this property.

11.3 No-Go Alternative

It is suggested that to maintain the status quo is not the best option for the macro environment. The do-nothing (“no go”) option would entail not using the site and maintaining the site as is. From certain perspectives this is not a viable option as the site is situated within an urban area surrounded by either upcoming or already existing residential communities. By not developing the site, the site will be anomalous in the context of the surrounding urban residential land-uses, and some of the direct and indirect socio-economic benefits (i.e. job creation, etc.) will not materialise.

The proposed development is situated in an established urban area where economic and social amenities are readily available such as; the Akasia Golf Club, the Akasia High School, Theresapark Primary School, the Hatfield Christian Church North, Heatherdale Cemetery, the Wonderpark Shopping Centre, the Akasia Netcare Hospital, the Akasia Town Hall and the Akasia Municipal Office.

The densification and compaction of the area by means of the proposed development will have the advantages of a more compact urban form that discourages dispersed urban sprawl; and the provision of a wider range of housing typologies in the area. Further, the proposed development is compatible with the surrounding land uses.

From an environmental perspective, the site has a certain degree of ecological sensitivity due to the presence of the Boepensspruit that flows southwest and west of the study area. The stream is just outside of the boundaries of the study area. The 50-year and 100-year floodlines are also mostly outside of the actual study site. Only a small portion is within the south western border of the site. This small section is completely within the 32m regulated zone.

However much of the ecological linkages between the site and surrounding natural areas have been lost due to the increase in development around the site. Not developing the site will assist in protecting the natural features on the site, however the development as proposed will maintain the floodline/watercourse area as an undeveloped but importantly as an actively managed and controlled area. The regulated area is proposed to be zoned as ‘Public open space’ (erf 451). This will entail 0.4175ha and approximately 20% of the township.

The No-Go development alternative could therefore not be considered the responsible way to manage the site.

12 SPECIALIST INPUT

Specialist input was obtained to investigate the impact of the various alternatives that could accomplish the purpose of the project. The specialist input is summarised as follows:

12.1 Biodiversity Assessment

A Biodiversity Assessment has been conducted by Flori Scientific Services CC. The report identified the following:

1 Terrestrial Ecology

Vegetation

The study site is situated within the original extent of Marikana Thornveld, which is within the Savanna Biome of South Africa. The vegetation of the study area is a mix of transformed areas (near and around the dwellings); degraded thornveld (in areas of exotic trees); and moderately degraded thornveld (northern section of the study site). The open, thornveld area in the north of the study site is characteristic of Marikana Thornveld, with Acacia thorn trees being prominent in the landscape. The site is within an agricultural holdings (A.H.) area that has become densely urbanised, with some plots previously been cultivated on a regular basis. The study site does not appear to have been historically cultivated or even grazed with cattle on any significant level. There is no pristine Marikana thornveld vegetation present on the study site.

Priority species

No red data (endangered & threatened) species were observed during field investigations. According to the SANBI database, a number of red data species have been previously collected and recorded in the greater area (QDS) in which the study area is situated. However, most of these priority floral species occur in rocky areas and ridges much further to the south of the study site. Two Orange Data Plant species (*Gladiolus eliotii* & *Aloe greatheadii*) were observed in the study area.

Protected trees in the study area

There are no protected trees in the study area.

Fauna

No red data listed faunal species were observed during field investigations. None are expected to routinely occur, nest or breed on the study site.

2 Aquatic Ecology

Watercourses in the study area

There are no watercourses in the study area. This includes seasonal streams and wetlands. However, a small, semi-perennial stream, the Boepensspruit, flows all along the western boundary of the study site, with some of the riparian vegetation been within the edge of the site. The original flow and channel of the Boepensspruit (stream) has been altered. The floodplain of the stream is very wide south / southwest of the study site, but then gets channelled very narrowly into stormwater culverts that run under the road (1st Ave) and then stays in a deep, narrow channel all along the western boundary of the study site.

Drainage regions

A summary of the drainage regions and management areas of the study site are summarised in the table below:

Level	Category
Primary Drainage Area (PDA)	A
Quaternary Drainage Area (QDA)	A23E
Water Management Area (WMA)	Limpopo (WMA 1)
Sub-Water Management Area	Upper Crocodile
Catchment Management Agency (CMA)	Limpopo (CMA 1)
Priority Quaternary Catchment	No
Wetland Vegetation Ecoregion	Central Bushveld Group 2

Sensitivity analyses

The ecological sensitivity of the study area is determined by combining the sensitivity analyses of both the floral and faunal components. The highest calculated sensitivity unit of the two categories is taken to represent the sensitivity of that ecological unit, whether it is floristic or faunal in nature. According to the analyses of the floristic, faunal and overall ecological sensitivities there are no high sensitivity areas or habitats. In other words, there are no 'No-Go' areas within the study area. Even though the actual sensitivity of the stream is calculated to be 'Medium', the sensitivity should be raised to 'High', by default, because it is a watercourse.

The sensitivity analyses is summarised in the table below:

Ecological community	Floristic sensitivity	Faunal sensitivity	Ecological sensitivity	Development Go-ahead
Transformed Areas	Medium/Low	Medium/Low	Medium/Low	Go-Slow
Thornveld	Medium/Low	Medium/Low	Medium/Low	Go-Slow
Stream	Medium	Medium	Medium	Go-But

Fatal flaws

There are no fatal flaws.

Priority areas

The study area does not fall within any national priority areas. These priority areas include formal and informal protected areas (nature reserves); important bird areas (IBAs); RAMSAR sites; National fresh water ecosystem priority areas (NFEPA) and National protected areas expansion strategy (NPAES) focus areas.

The study site is not within any critical biodiversity areas (CBA), but is on the boundary of an ecological support area (ESA), which is the extent of the Boepensspruit.



Figure 7: Sensitivity map of the study area

12.2 Heritage Impact Assessment - Exemption Request

Archaetnos Culture & Cultural Resource Consultants submitted a request for exemption from conducting a Heritage Impact Assessment.

The following is applicable:

- The entire site is disturbed. It consists of landscaped gardens, lawns, areas with rubble and buildings.
- No natural vegetation is present on the site – impacted because of landscaping.
- A few small trees in the area are thorn trees, mainly a result of disturbance and are regarded as regrowth.
- Other trees are alien species and therefore also the result of disturbance.
- The buildings on the property is younger than 60 years or temporary structures.
- None of these have any heritage significance.

Due to the mentioned factors, the chances therefore of finding any heritage related features are indeed extremely slim. It is therefore believed that an additional Heritage Impact Assessment (HIA) is not needed for this project.

Recommendation:

That the development be exempted from doing an HIA.

Mitigation

Should construction work begin for this project:

The developer should note that due to the nature of archaeological material, such sites, objects or features, as well as graves and burials may be uncovered during construction activities on site. In such a case work should cease immediately and an archaeologist should be contacted as a matter of urgency to assess such occurrences.

12.3 Town Planning

Metroplan Town Planners and Urban Designers is submitting an Application in terms of Section 16(4) and as required in terms of Schedule 6 of the City of Tshwane Land Use Management By-law, 2016 for the establishment of the Eldorette Extension 54 township on Holding 42 Heatherdale Agricultural Holdings.

The purpose of the township establishment application is to obtain permission to establish a residential township on Holding 42 Heatherdale Agricultural Holdings. The proposed township will comprise of forty-seven (47) "Residential 1" zoned erven with a minimum erf size of 200m², a "Special" zoned erf for private roads, a "Private Open Space" erf and streets.

12.4 Geotechnical investigation

A Phase 1 Geotechnical investigation was conducted by Soilkraft CC. Appendix G refers. The findings are summarised as follows:

The property is regarded as being of intermediate favourability for the proposed development. The following issues must be taken into account:

Geology: Trial holes suggest that the site is underlain by thick successions of alluvium, largely originating from residual norite. No bedrock was encountered.

Soil Profiles: Soil profiles on the site consisted of colluvial soil cover overlying multiple horizons of alluvium. All material test samples proved to be either highly expansive or very highly expansive.

Groundwater: No seepage or perched water was encountered in any of the trial holes; however, it is expected that perched water levels or seepage water may occur during years of high rainfall. Such seepage water will be dictated by the adjacent non-perennial water course.

Founding Conditions: The entire site is classified as H3, indicating that unrestrained heave in excess of 30mm is expected.

Conditions of Excavation: Conditions of clayey excavation dominate the site. Trial holes were excavated to depths between 240mm and 2700mm and not refusal of excavation was encountered in any of the excavations made.

Soil Corrossivity: Conditions of extremely corrosive soils must be anticipated.

Historic Monuments: There are no historic monuments on the site.

Undermining: The site is not undermined.

Dolomite Stability: The site is not located on dolomitic land.

Seismicity: A 10% probability exists that an earthquake with Peak Ground Acceleration of 0.12g to 0.16g may take place once in 50 years.

Recommendations

Proposals for Founding and Construction

Founding in this area may be done by means of a reinforced raft or soil replacement raft, depending on which option is most cost effective. The exact amount of heave to be accommodated on individual erven must be determined during the phase two geotechnical investigation, but a general guideline is that between 60mm and 100mm of heave should be anticipated. The superstructure should also have reinforced masonry and articulation joints, as per the engineering design.

It is critical that site drainage and storm water be planned carefully to ensure efficient drainage. No storm water or surface runoff should accumulate or pond within 1.5m of the structures. Services and plumbing precautions must be put in place to ensure that underground services are not disrupted by the heaving action of expansive in situ soils.

Conditions of Excavation

General recommendations on excavation are given below, based on the parameters of "Conditions of Excavation" as per SANS 1200. The following is recommended:

Colluvium: Colluvial materials should best be excavated by machine. While hand excavation will be possible, the cohesive nature of the material would make it difficult to excavate by hand.

Alluvium: As with the colluvium, all alluvial soils should best be excavated by machine and hand excavation is not recommended.

Clayey Excavation: Provision should be made for the excavation of clayey, cohesive soils.

Depth of Excavation: The general guideline in this regard is that excavation by backhoe was proven to depths between 2400mm and 2700mm without encountering refusal of excavation when using a backhoe.

Excavation Stability: Provisions must be made to ensure excavation stability. The safety of all persons working in or near open excavations must be ensured. It is recommended that provision be made for bracing, shoring or battering of excavation walls to mitigate expected instability.

Seepage Water: It must be anticipated that excavations may be affected by water ingress during years of high rainfall.

Seismicity

The risk of a seismic event occurring is within bounds of the SANS634 specification.

Soil Corrosivity

In situ materials must be considered extremely corrosive. As such, it is recommended that provision be made to protect metallic objects (e.g. services, utilities, etc.) installed below ground level. The use of PVC or protectively coated materials may be considered, but should also take into account the expansive nature of in situ soils.

12.5 Electrical Services

An Electrical Services report has been compiled by Kuyper Saayman Consulting Electrical Engineers. Refer to Appendix G.

The total demand for the development was calculated as 235kVA/340,58 amp. An 11kV overhead MV network exist in First Avenue. If the projected 235kVA stays the same after the internal detail design completion, the next circuit breaker size will be 350 amp/241,5kVA for a Tshwane Maximum Demand electrical connection on the stand boundary facing First Avenue.

The report concludes by stipulating that the necessary changes will be done by the township owner on the Tshwane 11kV network to accommodate this development and it will be addressed and incorporated in the FA electrical design with the Tshwane electrical service agreement process after township approval

12.6 Engineering Services

Reports titled “*Services report: Water and Sanitation*” and “*Services report: Roads & Stormwater*” have been compiled by LJR Civil Consultants. Refer to Appendix G.

Water Reticulation

An existing 200 Ø water pipe runs on the southern side of First Avenue past the development’s southern boundary. The development can connect to the mentioned 200 Ø line. Due to the fire flow, it is proposed that a 160 Ø connection must be done. No upgrading to existing water reticulation is required.

The total new daily water demand is 32.9000 kl/day.

Sewer Network

The closest existing sewer line to where the site can drain is a 400Ø sewer line north of the Township on the corner of John Street and Willem Cruywagen, which is located 525 m away. It is proposed that the new sewer line will travel along Main Street to tie into an existing man hole on the corner of John Street and Willem Cruywagen. It would be more economically and the stream crossing would allow to tie into the existing. As the western portion of the development is public open space, they do not require sewer connections. The total new sewage outflow will be 28.2000 kl/day.

Access

Access to the township will be via First Avenue from the southern boundary of the site, into the proposed township.

Roads

A Traffic statement was prepared by WSP. The statement indicate that no traffic report is required. The existing road (First Avenue) on the southern boundary of the proposed township is not to the current standards of CoT. The developer needs to upgrade the portion of First Avenue in front of the proposed township.

Stormwater

No stormwater infrastructure exists in First Avenue. An earth canal runs on the western boundary of the site. There is no pipe stormwater system in First Avenue. The site drains to the north eastern corner towards Holding 39. It was however discussed with City of Tshwane that the site can drain to the earth canal on the western side of the site, with outlets above the 1:20 year floodline.

The 1:2 year post development was used to design the stormwater system. To ensure the pipe system can drain to the canal, a portion of the site must be filled as indicated on the roads and stormwater layout drawing in the said report.

It is therefore recommended that the developer install all the pipe systems, including KI'S junction boxes and grid inlets as indicated on the drawings in the said report. Erosion protection must be implemented at the outlets and servitudes must be registered as indicated.

12.7 Waste Management

The collection of solid waste should be carried out by the CoT. A refuse area will be accommodated on site and waste will be disposed of at the municipal dumping site as per the requirements of the Municipal Health Bylaws.

12.8 Flood line Assessment

A flood line Assessment was conducted by SRK Consulting. Appendix G refers.

The Boepensspruit, a tributary of Apies River, runs on the north western side of the proposed development site flowing into the north easterly direction. The centre of the watercourse is approximately 15 m from the boundary of the proposed development site and thus flooding problem is likely to occur within the proposed development site. A need was therefore identified to carry out a detailed floodline study to assess the possible flooding risk due to the 1:50 and 1:100 year flood events. The proposed development is situated outside the 1:100 year floodline. Inundation of water is expected within the proposed development due to the low lying areas.

The following is concluded:

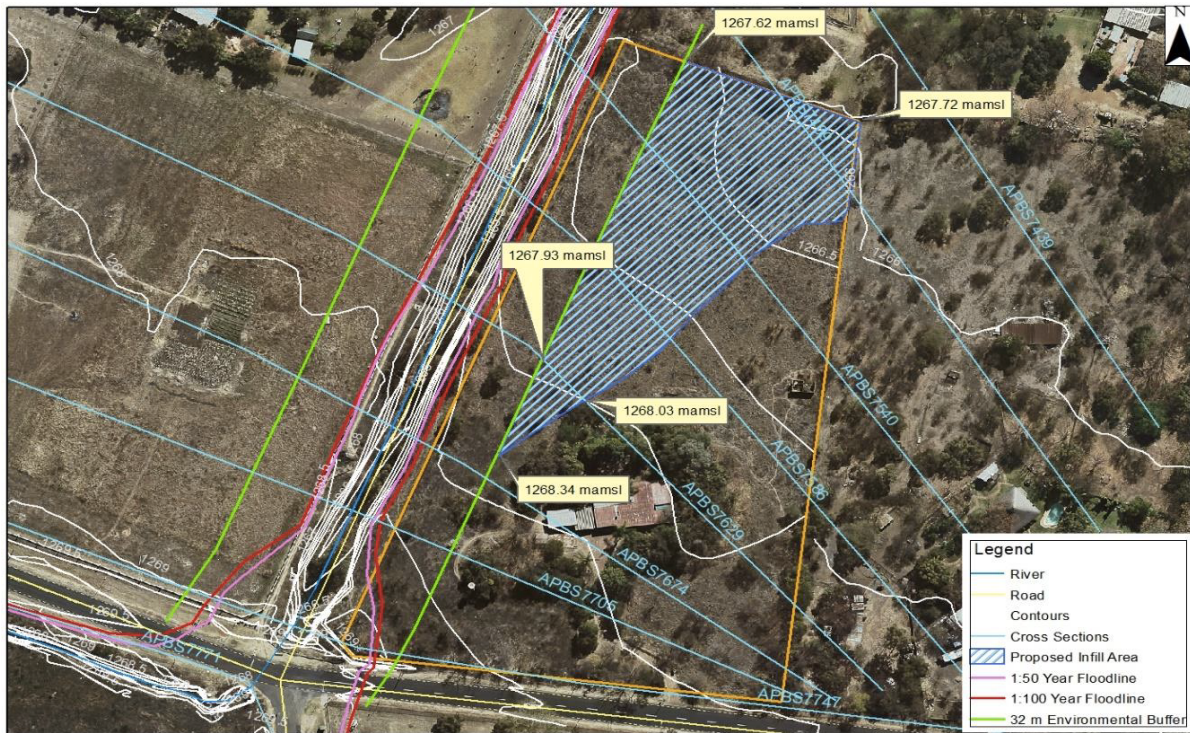
- The 1:100 year floodline is restricted within the watercourse.
- Due to low lying areas within the proposed development site, approximately 65% of the proposed development site will be inundated by stormwater run-off.
- A portion of the proposed development site is situated within the 32 m Environmental Buffer.
- The average flood depth of the 1:100 year floodline along the flood plains is expected to be 0.24 m along the floodplains where development is to be done and thus inconvenience due to 1:50 and 1:100-year flood event can be expected without causing any damage to infrastructure.
- Soil erosion of floodplains due to flood velocities of 0.7 m/s can be expected within the proposed development site.

The following is recommended:

- The floodline information to be used to ensure that no new development is situated within the 1:100 year floodline.
- The proposed development should be situated outside the 32 m Environmental Buffer.
- The low lying areas within the proposed development site to be filled to avoid the inundation of surface run-off during the 1:100 year flood event.
- The floodlines be revised should watercourse/control structures be modified in the future.
- The river banks to be stabilized to avoid erosion due to high 1:100 year flood velocities.
- Any specialist studies including the environmental compliance studies that might be needed must be done in consultation with relevant authorities.

Considering the above information, the areas affected by the 1:50 and 1:100 floodline as well as a 32m regulated area was excluded from the development and will be accommodated in a proposed "Public Open Space" property.

Figure 8: Proposed flood levels for 1:50 Year to 1:100 Year Return periods. The hashed section is the proposed infill area



12.9 Traffic

A Traffic Statement was compiled by WSP Group Africa Consulting Engineers. Appendix G refers. Eldorette Extension 54 is a proposed “Residential 1” development that will accommodate 47 single dwelling units. It is anticipated that this development will generate approximately 47 trips on the external road network. According to the adopted manual by CoT, the scenario provided in this letter, and the size of this development, it is not required to undertake and submit a Traffic Impact Assessment.

According to COTO’s TMH 16 – South African Traffic Impact and Site Traffic Assessment Manual, Volume 1, Version 1.0, dated August 2012, a statement is made under Section 2.1, Subsection 2.6.2 as follows:

“A Traffic Impact Assessment shall be undertaken and submitted when an application is made for a change in land use and when the highest total additional hourly vehicular trip generation (including pass-by and diverted trips) as a result of the application exceeds 50 trips per hour.”

The additional hourly vehicular trip generation as a result of this application does not exceed 50 trips per hour. Further to the above, the development trips will be fairly distributed. Taking into account the weekday peak hour development trips and the surrounding area, it is assumed that the development trips will be distributed as follows:

- Approximately 20% westwards, via First Avenue into Doreen Avenue, with 7 and 2 development trips exiting and entering, respectively;
- Approximately 10% southwards, via Main Street into Brits Road, with 4 and 1 development trip(s) exiting and entering, respectively; and
- Approximately 70% eastwards, via First Avenue (with 24 exiting and 8 entering) and a further three-way split into Willem Cruywagen Lane and Oribi Street.

The development trips to be generated by this development will have a negligible effect on the external road network. As per the South African Traffic Impact and Site Assessment Manual, adopted by the City of Tshwane Metropolitan Municipality (CoT), the above scenario, and the size of the proposed Eldorette Extension 54 Township, it is not required to undertake and submit a Traffic Impact Assessment.

13 IMPACT ASSESSMENT

The impacts that may result from the planning and design, construction, operational, decommissioning and closure phases as well as proposed management of identified impacts and proposed mitigation measures have been addressed in the Basic Assessment Report.

14 ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr)

An Environmental Management Programme was prepared to detail a plan of action to ensure that recommendations for preventing the negative environmental impacts (and where possible improving the environment) are implemented during the life-cycle of the project.

15 CONCLUSION

In summary the following is recommended for authorisation:

The maps attached in Appendix A indicates/highlights the whole area (inclusive of the floodline area) that was investigated to inform GDARD on the area that is part of the authorisation. The wider area that was investigated will allow future potential amendments to the EA should it be necessary (at a later stage). Should small changes be done to the layout of the site after authorization, it will not be considered crucial and will not warrant a new application.

However, development will not be allowed in the 32m regulated area, which is recommended to be earmarked as a green zone. Only 'water uses', as applied for to the Department of Water and Sanitation, will be allowed in the 1:100 year floodline area. Therefore, for the construction, operation, maintenance and management for the controlled release of stormwater, including stormwater attenuation structures, sewage reticulation system, water supply network, electrical supply, roads, any buildings (no new roads or buildings are within the regulated area), fences and or any other activity that is within the Boepensspruit (watercourse) as proposed for the development, will require a Water Use License Application (WULA) in terms of the National Water Act.

The Preferred/Proposed Layout is recommended for authorisation of the proposed development.
