GA Environment

DRAFT BASIC ASSESSMENT REPORT

The Proposed Bryanston Ext. 3B Housing Development as Part of The Rapid Land Release Programme for The Gauteng Department of Human Settlements, City of Johannesburg Metropolitan Municipality, Gauteng Province

July 2021

GAUTENG PROVINCE
HUMAN SETTLEMENTS
REPUBLIC OF SOUTH AFRICA

Environmental best practice, safety and sustainability

DRAFT BASIC ASSESSMENT REPORT

FOR

THE PROPOSED BRYANSTON EXT. 3B HOUSING DEVELOPMENT AS PART OF THE RAPID LAND RELEASE PROGRAMME FOR THE GAUTENG DEPARTMENT OF HUMAN SETTLEMENTS, CITY OF JOHANNESBURG METROPOLITAN MUNICIPALITY, GAUTENG PROVINCE

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JULY 2021

PROJECT INFORMATION

Title:	Draft Basic Assessment for the Proposed Bryanston Ext. 3B Housing Project as Part of The Rapid Land Release Programme of the Gauteng Department of Human Settlements, City of Johannesburg Metropolitan Municipality, Gauteng Province
Competent Authority:	Gauteng Department of Agriculture and Rural Development (GDARD)
Applicant:	Gauteng Department of Human Settlements
Environmental Consultants	GA Environment (Pty) Ltd
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Date:	July 2021

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SIGNING OF THE ORIGINAL DOCUMENT

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GAUTENG PROVINCE
AGRICULTURE AND RURAL DEVELOPMENT
REPUBLIC OF SOUTH AFRICA

Basic Assessment Report in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended, and the Environmental Impact Assessment Regulations, 2014 (Version 1)

Kindly note that:

1. This **Basic Assessment Report** is the standard report required by GDARD in terms of the EIA Regulations, 2014.

2. This application form is current as of 8 December 2014. It is the responsibility of the EAP to ascertain whether subsequent versions of the form have been published or produced by the competent authority.

3. **A draft Basic Assessment Report must be submitted, for purposes of comments within a period of thirty (30) days, to all State Departments administering a law relating to a matter likely to be affected by the activity to be undertaken.**

4. **A draft Basic Assessment Report (1 hard copy and two CD's) must be submitted, for purposes of comments within a period of thirty (30) days, to a Competent Authority empowered in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended to consider and decide on the application.**

5. Five (5) copies (3 hard copies and 2 CDs-PDF) of the final report and attachments must be handed in at offices of the relevant competent authority, as detailed below.

6. The report must be typed within the spaces provided in the form. The size of the spaces provided is not necessarily indicative of the amount of information to be provided. The report is in the form of a table that can extend itself as each space is filled with typing.

7. Selected boxes must be indicated by a cross and, when the form is completed electronically, must also be highlighted.

8. An incomplete report may lead to an application for environmental authorisation being refused.

9. **Any report that does not contain a titled and dated full colour large scale layout plan of the proposed activities including a coherent legend, overlain with the sensitivities found on site may lead to an application for environmental authorisation being refused.**

10. The use of "not applicable" in the report must be done with circumspection because if it is used in respect of material information that is required by the competent authority for assessing the application, it may result in the application for environmental authorisation being refused.

11. No faxed or e-mailed reports will be accepted. Only hand delivered or posted applications will be accepted.

12. Unless protected by law, and clearly indicated as such, all information filled in on this application will become public information on receipt by the competent authority. The applicant/EAP must provide any interested and affected party with the information contained in this application on request, during any stage of the application process.

13. Although pre-application meeting with the Competent Authority is optional, applicants are advised to have these meetings prior to submission of application to seek guidance from the Competent Authority.

DEPARTMENTAL DETAILS

Gauteng Department of Agriculture and Rural Development
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P.O. Box 8769
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(For official use only)

NEAS Reference Number:						
File Reference Number:						
Application Number:						
Date Received:						

If this BAR has not been submitted within 90 days of receipt of the application by the competent authority and permission was not requested to submit within 140 days, please indicate the reasons for not submitting within time frame.

Not Applicable

Is a closure plan applicable for this application and has it been included in this report? **No**

if not, state reasons for not including the closure plan.

This application is for a new activity/development and there are **no** plans to decommission the infrastructure in the near future and therefore a closure plan will not be attached to this basic assessment report.

Has a draft report for this application been submitted to a competent authority and all State Departments administering a law relating to a matter likely to be affected as a result of this activity? **Yes**

Is a list of the State Departments referred to above attached to this report including their full contact details and contact person? **Yes**

If no, state reasons for not attaching the list.

List of state departments attached as **Appendix E9.**

Have State Departments including the competent authority commented? **Yes**

If no, why?

The report is in the Draft Basic Assessment Phase and is currently under review by the relevant State Departments following distribution of the DBAR as per Regulation 43(2) of the EIA Regulations, 2014 as amended.

SECTION A: ACTIVITY INFORMATION

1. PROPOSAL OR DEVELOPMENT DESCRIPTION

Project title (must be the same name as per application form): BASIC ASSESSMENT FOR THE PROPOSED HOUSING DEVELOPMENT IN BRYANSTON EXTENSION 3B

1.1 Introduction and Background

The Gauteng Department of Human Settlements (GDHS) is proposing to construct affordable housing on erven 3975, 3976, 3977 and 3978 in Bryanston Extension 3, in Ward 104 of the City of Johannesburg. The total area of the four erven that make up the site is 1.36 hectares (13,600m²) in extent and the site is currently zoned 'Residential 1'. A Rezoning and Consolidation Application (Reg. 20-04-2659) to change the zoning of the site from 'Residential 1' to 'Residential 3' was submitted by the appointed Town Planners to the Town Planning Department of the City of Johannesburg Metropolitan Municipality. The proposed Bryanston Ext 3B site is one of four vacant state-owned land parcels within Bryanston Extension 3 that the GDHS has proposed to develop. The Bryanston 3C and 3D sites do not trigger the need for an Environmental Impact Assessment, and this was confirmed by GDARD on 25/09/2019 and 11/12/2019 respectively. Bryanston 3A site requires a Basic Assessment which is being undertaken by K2M Environmental.

The project is part of the Rapid Land Release Programme (RPRP) which was launched in 2018 by the Premier of Gauteng Province, Mr David Makhura. The RLRP is a component of the broader land reform programme in the Province and the Republic of South Africa and is aimed at unlocking economic value through the release of properties to qualifying beneficiaries for various purposes which include housing as well as agricultural sites, commercials sites. The RLRP mainly aims to identify land parcels that are currently vacant, owned by either the National, Provincial or Local Government which can be allocated to qualifying beneficiaries.

In terms of the NEMA EIA Regulations, 2014 as amended: GN327 promulgated under Chapter 5 of the National Environmental Management Act (Act 107 of 1998) ("NEMA") and published in Government Gazette No. 40772 on 07 April 2017, a Basic Assessment is required for this project. It is legislative requirement under this Act that an application for environmental authorisation must be obtained before the construction of houses on identified land is developed. GA Environment (Pty) Ltd has thus been appointed by GladAfrica Consulting Engineers to undertake a Basic Assessment for the proposed construction of affordable housing in Bryanston Extension 3, City of Johannesburg, Gauteng Province.

1.2 Project Location

The Bryanston Ext. 3B site is one of four (4) land parcels located in Ward 104 within Sub-Region 20 earmarked for the development of housing by Gauteng Department of Human Settlements (Refer to **Figure 3**). The Bryanston Ext. 3B site is located approximately 30km north of the Johannesburg CBD

within Region B of the City of Johannesburg Metropolitan Municipality, where it borders Region E to the West. The co-ordinates of the approximate centre point of the site are 27°58'55.6"S; 26° 4' 4.6 "E. The site is located within the boundaries of the Ferndale Valley Arboretum and is surrounded by Spruce Street to the North, the broader Ferndale Valley Bird Sanctuary and Arboretum to the East and South and Cork Avenue to the West. The Ferndale Valley Arboretum is managed by of the Johannesburg City Parks and the Zoo. The site for the proposed development is situated along Spruce Street and Cork Avenue and direct access is available from these streets. The site is currently fenced off to protect the area from vagrants, squatters, littering and general environmental degradation. Maintenance of the site is undertaken by the residents within the area. A 1:50 000 topographical map of the site and its locality is presented in **Figure 1** and **Appendix A.**

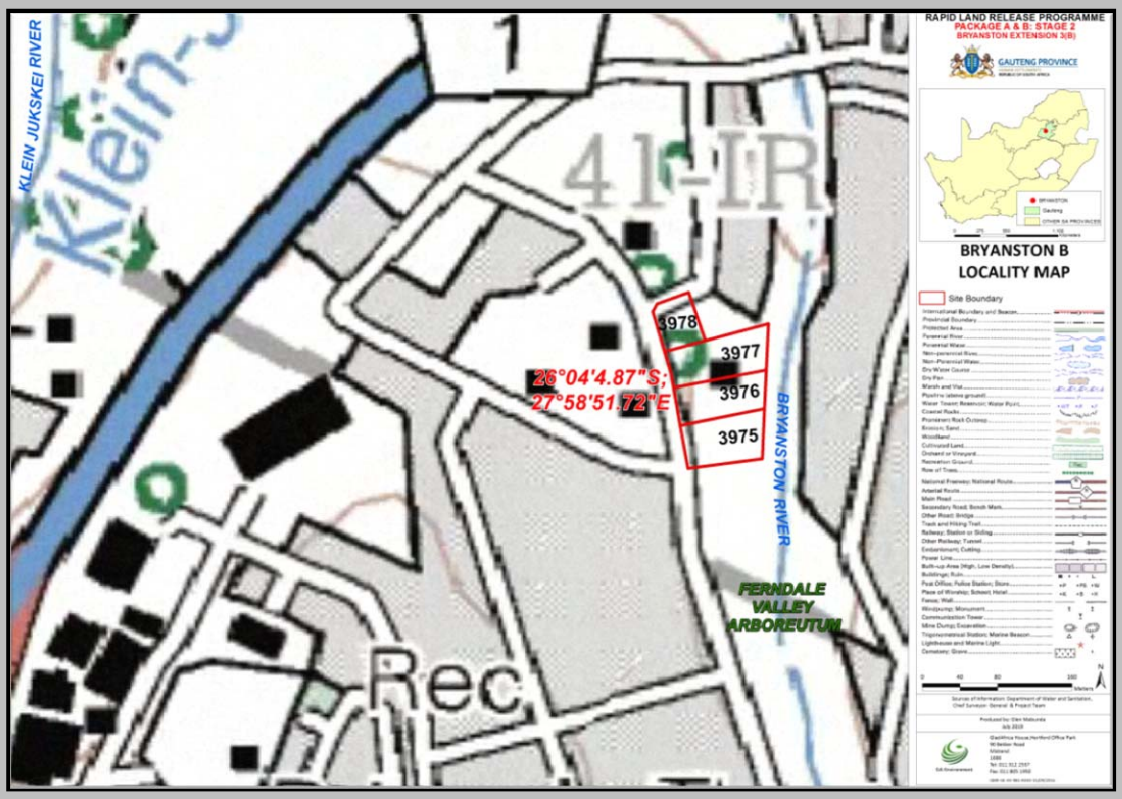


Figure 1: 1:50 000 topographical map of the site locality

The study area is located within the fenced boundaries of the Ferndale Valley Bird Sanctuary and Arboretum and is bordered in the East by the Bryanston River, a tributary of the Klein Jukskei River. The development is proposed on Erven 3975, 3976, 3977 and 3978 located in Extension 3, all of which are all owned by the Gauteng Provincial Government (Refer to **Table 1**).

Table 1: Property description and ownership

Property Description	Ownership	Title Deed Number	Extent (m²)
Erf 3975 Bryanston Extension 3	Gauteng Provincial Government	T39723/2013	3825
Erf 3976 Bryanston Extension 3	Gauteng Provincial Government	T39723/2013	3509
Erf 3977 Bryanston Extension 3	Gauteng Provincial Government	T39723/2013	4221
Erf 3978 Bryanston Extension 3	Gauteng Provincial Government	T39723/2013	2062
Total			**13,617**

All the ervens of the site are currently zoned "Residential 1" in terms of the City of Johannesburg Town Planning Scheme. The site is currently vacant and is surrounded predominantly by vacant land (which has also been earmarked for purposes of the Rapid Land Release Programme) and there are a few industrial and commercial uses in the surrounding area. The intention of GDHS is to develop the vacant site into 184 walk-up residential units constructed within the site boundary away from the sensitive environment as identified by Biodiversity Specialists.

1.3 Project Description and Scope

The proposed financing model for the Bryanston Ext 3B development consists of Finance-Linked Individual Subsidy Programme (FLISP) residential units of three or four-storey buildings for first-time homeowners. The FLISP programme is a housing subsidy for first-time home buyers to assist with purchasing a home. The subsidy is paid to the homeowner's bank or financial institution and will reduce the monthly loan instalments, making it more affordable to buy a home. Households with an income between R3,501 to R22,000 may qualify for the FLISP subsidy if they meet all the criteria. The development footprint is 7,040 m² and the site will be rezoned to 'Residential 4' through the rezoning and consolidation township application. The development was initially planned to provide up to 247 units and 0.75 parking spaces per unit to reduce car usage and in line with other studies that will investigate and encourage the use of public transport, based on the target market which typically do not own motor vehicles. The number of units have now been reduced to 184 due to the technical and environmental challenges encountered during the project planning processes. The proposed development will also include the upgrading of access roads, stormwater infrastructure, bulk water and sewer and provision of parking areas, etc. A site development plan is presented in **Figure 2** and **Appendix A.**

Figure 2: Proposed Site Development Plan

Four layout alternatives have been considered to address spatial, visual, environmental, and social requirements identified during the Basic Assessment process. These alternatives are discussed in **Section 3** of this report and are fully assessed as part of the Basic Assessment process.

The site is within a low to medium density residential area, consisting of predominantly single residential erven. The proposed development concept is for the development of FLISP housing in 4-storey walk-ups. In line with Social Housing Regulatory Authority (SHRA) Guidelines, the unit sizes will vary between 25m² to 45m². The proposal is to develop 184 units on the site in the form of 4-storey walk-ups. The units will be divided into 9 separate buildings or blocks and the number of units in each block ranges between 20 and 24 units per block. Open Space for the development has been provided at 5,060m², which far exceeds the minimum requirements for open space in terms of the Town Planning Scheme. Provision has been made for 144 parking spaces for the development.

The City of Johannesburg Spatial Development Framework (SDF) indicates that the site lies within an industrial node which is well-defined by the N1 Highway to the West and a BRT linkage to the East. The SDF is a city-wide spatial policy document premised on spatial transformation, defined through the principles of equity, justice, resilience, sustainability, and urban efficiency which it seeks to translate into a development policy. Various sites in the area have been identified by the GDHS for the development of housing, including other similar private developments as illustrated in **Figure 3**.

Figure 3: Location of surrounding developments

Four housing developments are currently being proposed by the GDHS in the area, namely: Bryanston Ext 3A, 3B, 3C and 3D; whereas the earlier-mentioned private developments are located 380 meters Southwest of the site namely Notting Hill (125 dwelling units per hectare) and Brushwood Complex (100 dwelling units per hectare).

Figure 4: Existing similar developments located close to the site

The existing private developments are 4-Storey apartments with face brick, plaster, paint and curved metal roofs. The proposed FLISP housing designs will incorporate some of the above listed properties and will include modern finishes as illustrated in **Figures 5** and **6** below.

Figure 5: Front end facade of the building visible from the Cork Avenue

Figure 6: Back-end façade where play areas and open spaces are to be located

Development of the site would be considered infill development which promotes densification and avoids urban sprawl, resulting in the optimal utilisation of the land parcels. The proposed development is located in close proximity to the Strydompark Industrial node with various employment opportunities for the future residents and may act as a catalyst for the development of the surrounding vacant properties.

Urban design deals primarily with the design and management of public space (i.e. the 'public environment', 'public realm' or 'public domain'), and the way public places are experienced and used. Public space includes the totality of spaces used freely on a day-to-day basis by the general public, such as streets, plazas, parks, and public infrastructure. Some aspects of privately-owned spaces, such as building façades or domestic gardens, also contribute to public space and are therefore also considered.

The proposed development will incorporate the six basic principles of urban design outlined in **Table 2** below.

Table 2: General Urban Design Principles (Plan Associates, 2019)

General Urban Design Principles	
Places of People	For places to be well-used and well-loved, they must be safe, comfortable, varied and attractive. They also need to be distinctive, and offer variety, choice and fun. Vibrant places offer opportunities for meeting people, playing in the street and watching the world go by.
Enrich the Existing	New development should enrich the qualities of existing urban places. This means encouraging a distinctive response that arises from and complements its setting. This applies at every scale – the region, the city, the town, the neighborhood, and the street.
Make Connections	Places need to be easy to get to and be integrated physically and visually with their surroundings. This requires attention to how to get around by foot, bicycle, public transport and the car – and in that order.
Work with the Landscape	Places need to strike a balance between the natural and man-made

	environment and utilise each site's intrinsic resources – the climate, landform, landscape and ecology – to maximize energy conservation and amenity.
Mix Uses and Forms	Stimulating, enjoyable and convenient places meet a variety of demands from the widest possible range of users, amenities and social groups. They also weave together different building forms, uses, tenures and densities.
Design for Change	Develop needs to be flexible enough to respond to future changes in use, lifestyle and demography. This means designing for energy and resource efficiency; creating flexibility in the use of property, public spaces and the service infrastructure and introducing new approaches to transportation, traffic management and parking.

The streetscape of individual buildings should encourage a pedestrian-friendly environment and walk-in traffic as some of the beneficiaries of the proposed development will not own cars. The design of the sidewalks will create an urban character whereby the sidewalk area will feature amenities such as street trees with tree grates, planters, benches and removable façade furniture. Sidewalks and pathways should ensure the mobility of all users by accommodating the needs of people regardless of age or ability. Pedestrian routes will offer direct convenience, but also safety and interest amongst other essential qualities and link to available public transport networks.

1.4 Bulk Services in support of the development

The development will be serviced by the City of Johannesburg Metropolitan Municipality through provision of potable water, management of stormwater, roads, sewerage, electricity and any other required services. An assessment of the capacities of the existing bulk services (water, sewerage, roads and stormwater) was carried out in order to determine the requirements for any additional capacity in order to support the proposed development. The site drains from Cork Avenue towards the river in a West to East direction and there is no existing stormwater infrastructure system located within the site. Due to cambering of both Cork Avenue (eastern boundary) and Spruce Street (northern boundary) both streets act as "cut-offs" for the stormwater flow preventing any extra flow onto the site. Therefore, no "external" stormwater management needs to be considered for the site other than the flow coming from the site itself (GladAfrica, 2020). The site stormwater will therefore be managed and contained within the boundaries of the site. All stormwater management will be designed to comply with the requirements of the Johannesburg Roads Agency (JRA) Design Manual as well as the appropriate SABS specifications. It is a CoJ requirement, that a site with an area of more than 8,500m^2 (0,85 ha) must provide for stormwater attenuation on site and therefore a stormwater attenuation pond is proposed for the development.

For the supply of potable water, it is proposed that the development will be accommodated by a connection to the Kensington B Reservoir and the estimated water demand for the development is 147.2 kilolitres a day. The internal water reticulation for the proposed development will be designed once the Site Development Plan is approved.

The sewage will be treated at the Northern Wastewater Treatment Works (NWTW) where the outfall sewers will receive 110.4 kilolitres a day of sewage outflow from the proposed development. According to the sewer capacity report prepared by GLS Consulting Engineers, the NWTW has

adequate treatment capacity to accommodate the additional flows and no additional work on the sewer infrastructure will be required. The sewer network will be connected to the existing 150mm municipal sewer pipeline along the eastern boundary of the site.

In order to provide electricity for the 184 units, the supply to the area needs to be upgraded by installing a new cable from the existing substation to the development which will include the two other projects, Bryanston Ext 3C and 3D. The miniature substation for project 3B caters for the requirements of the 184 units as well as for the necessary streetlights. Refer to the Outline Scheme Report attached as **Appendix F3** for full details on bulk service provision.

1.5 Need and Desirability of the project

"While the South African government has created housing opportunities for 4.3-million people since 1994, government estimates that some 1.8 million people still do not have access to adequate housing and continue to live in informal settlements'' Human Settlements , Water and Sanitation Minister Lindiwe Sisulu, Engineering News, 2016.

The economic opportunities available within the Gauteng Province continue to attract a large population from other provinces of South Africa as well as across international boundaries. Similar to the Western Cape Province, the Gauteng Province, has a net positive migration and the migration patterns will continue to increase in the upcoming years. Although other provinces have shown a net negative migration, Gauteng continues to face rapid urbanisation challenges. The influx of population in this province continues to put significant pressure on the Gauteng urban management and sustainable planning. For this reason, sustainable adequate housing and service provision in Gauteng requires urgent and sustainable intervention from the government.

The above-mentioned problem is compounded by the issue of Gauteng being the smallest province in terms of land area while comprising the largest share of the South African population. In order to accommodate the growing population, Gauteng will need to acquire land for the construction of housing infrastructure and associated services and support infrastructure, while accommodating approximately 1,2 million people that are on the waiting list of the for housing in the Province. Illegal land invasion and the associated court order evictions, ongoing protests, overcrowding in townships, outbreak of diseases, construction of informal settlements within flood lines, etc., are some of the salient features that result from the slow rate of provision of the housing backlog.

In Gauteng, the GDHS is responsible for the provision of housing for beneficiaries on their list. In addition to housing, the GDHS recognises the need for the release of land for activities such as agriculture (to ensure food security) and for commercial activities as part of the creation of sustainable human settlements. It is mainly against this background that the GDHS, though the RLRP, is proposing this housing development in Bryanston as well as other areas within the Gauteng Province, as a step forward in addressing current housing backlog.

1.6 Requirement for Basic Assessment Process

As already described in Section 1.1, the proposed development is a listed activity in terms of the NEMA EIA Regulations, 2014 as amended. A 'listed activity' refers to any activity that is identified in the Schedule in any of the three Listing Notices that have been published under Government Gazette No 40772 on 07 April 2017 (an amendment of the 2014 Regulations that were published under Government Gazette No. 38282 on 04 December 2014). According to the NEMA Environmental Impact Assessment (EIA) Regulations, 2014 as amended, a Basic Assessment process is required for the proposed development for the following activities:

Table 3: Listed Activities being applied for under NEMA EIA Regulations

Project Activities	Listed Activity	Implications
GNR 983: (Listing Notice 1)		
Indigenous vegetation must be cleared to allow for the proposed development. Indigenous vegetation refers to plant species occurring naturally in an area, regardless of the level of alien infestation and where the topsoil has not been lawfully disturbed during the preceding ten years) that occurs on site	Listing Notice 1, Activity 27: *The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for –* *(i) the undertaking of a liner activity; or* *(ii) maintenance purposes undertaken in accordance with a maintenance management plan*	A Basic Assessment is required
The study area falls within priority biodiversity namely critical biodiversity areas.	Listing Notice 1, Activity 30: *Any process or activity identified in terms of section 53(1) of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004).*	A Basic Assessment is required
The development of up to 7m wide paved internal roads road within critical biodiversity area.	Listing Notice 3, Activity 4: *The development of a road wider than 4 metres with a reserve less than 13,5 metres.* *c. Gauteng* *iv. Sites identified as Critical Biodiversity Areas (CBAs) or*	A Basic Assessment is required

	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;*	
In order to implement the development, there needs to be clearance i.e. permanent removal of the indigenous vegetation that occurs within a Critical Biodiversity Area.	*Listing Notice 3, Activity 12:* *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 in:* **c. Gauteng** *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;*	A Basic Assessment is required
In order to implement the housing	*Listing Notice 3, Activity 14:*	A Basic Assessment is required

development, there needs to be development of infrastructure or structures with a physical footprint of 10 square metres or more within a Critical Biodiversity Area	*The development of—* *(ii) infrastructure or structures with a physical footprint of 10 square metres or more; where such development occurs—* *(c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse;* in **c. Gauteng** *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;*	

1.7 Specialist Assessments

Several specialist studies were undertaken to determine specific environmental impacts that may occur during the construction and operational phase of the development. According to Regulation 16(1)(v) of the NEMA EIA Regulations 2014, as amended, an Application for Environmental Authorisation must be accompanied by 'the report generated by the national web-based environmental screening tool'. The report which is generated by the Department of Forestry, Fisheries and the Environment (DFFE): Environmental Screening Tool Report is attached as **Appendix J**. In accordance with the requirements of Appendix 6 of the NEMA EIA Regulations, 2014 as amended, and a review of the DFFE Screening Tool, the following Specialist Studies were undertaken:

a) Floral Impact Assessment
b) Terrestrial Fauna & Avifauna Biodiversity Impact Assessment

c) Avifaunal Impact Assessment
d) Water Resource Assessment
e) Heritage Impact Assessment
f) Socio-Economic Impact Assessment

The Basic Assessment Process was also supported by a Professional team that included a Town Planner, Design Engineer, Traffic Engineer, Geotechnical Engineer, Architect as well as Community Development Facilitator. In addition, the following studies have been considered in the compilation of this Draft Basic Assessment Report and the reports from these studies are included in Appendix G of the report:

a) Geotechnical Investigation Report
b) Traffic Impact Assessment Report
c) Flood line Report

The impacts that are associated with the proposed housing development have been identified and assessed in this Basic Assessment report and the Environmental Management Programme (EMPr) that have been prepared for this development. These specialist studies are attached as part of **Appendix G** and the EMPr is attached as **Appendix H.** The information detailed in the specialists reports and the findings of the Professional team's investigations was also considered when describing the environmental setting of the site presented in **Section 1.8**.

1.8 Environmental Setting

The environment within the study area is largely unaffected by human activities and remains natural with an intact vegetation structure that forms part of a larger contiguous open space area. This area is defined by a watercourse and green belt, which is managed by both local authorities and the local resident's association as a bird sanctuary.

Land use

The location for the proposed development is zoned for residential use and is currently vacant **(Figure 7).**

Figure 7: An aerial photograph of the site, reflecting current status of the site

The site is located within the boundaries of Ferndale Valley Arboretum and is currently fenced, and access is controlled through a lockable gate. The site is managed by Johannesburg City Parks and Bryanfern Residents Association (BFRA) (**Figure 8).** Based on the information gathered during the initial site visit, CSS, a community watch service company also monitors the site as part of the general community monitoring duties.

Figure 8: Signage noted along the site fence, Bryanfern Residents Association and a sign confirming controlled access

The northern portion of the Arboretum, where Bryanston 3B development is proposed, is less disturbed and is located on a ridge that follows a green belt running through the BFRA territory (**Figure 7**). Although the proposed site is classified as a Park, it has not been formalised as a public park, as originally intended with the establishment of the township. Incidents of windblown litter were noted within the site boundaries along Cork Avenue.

According to the Gauteng Development Guidelines for Ridges, the extent of the study area is located on a largely untransformed Class 4 ridge, with only a limited portion thereof in the north and west indicated as being transformed. Ridges and higher-altitude areas, together with CBAs and ESAs, serve as important refugia, are critical for ensuring the long-term persistence of both species and ecosystems, and are important for ecological connectivity and climate change adaptation (City of Tshwane, 2016). The Ridges Guideline (2019) indicate that further development activities will not be supported in areas where the remaining contiguous extent of natural habitat is 4ha or more. From the findings of the field assessments undertaken by the Flora Specialist, the contiguous natural habitat within which the study area is located is considered to be larger than 4ha. Within this larger contiguous area, local modifications have sporadically occurred, mainly due to alien species encroachment. These modifications are however of limited extent and are estimated to constitute less than 20% of the study area.

The site falls within a ridge area which is considered by GDARD as a natural asset that requires management. According to this policy, development activities in an untransformed Class IV ridge area will not be supported. GDARD, however, allows for the submission of an environmental application to assess the environmental impacts of the proposed activity as the ridge has been significantly transformed and the study area is surrounded by development. Sections of the site fall within Zone 1 (Erf 3978) of the GPEMF an area reserved for infill development whereas the remaining 3 erven located south of this Erf fall within a high control zone (Zone 2) which is an area reserved for conservation and related recreation activities (Refer to **Figure 9**).

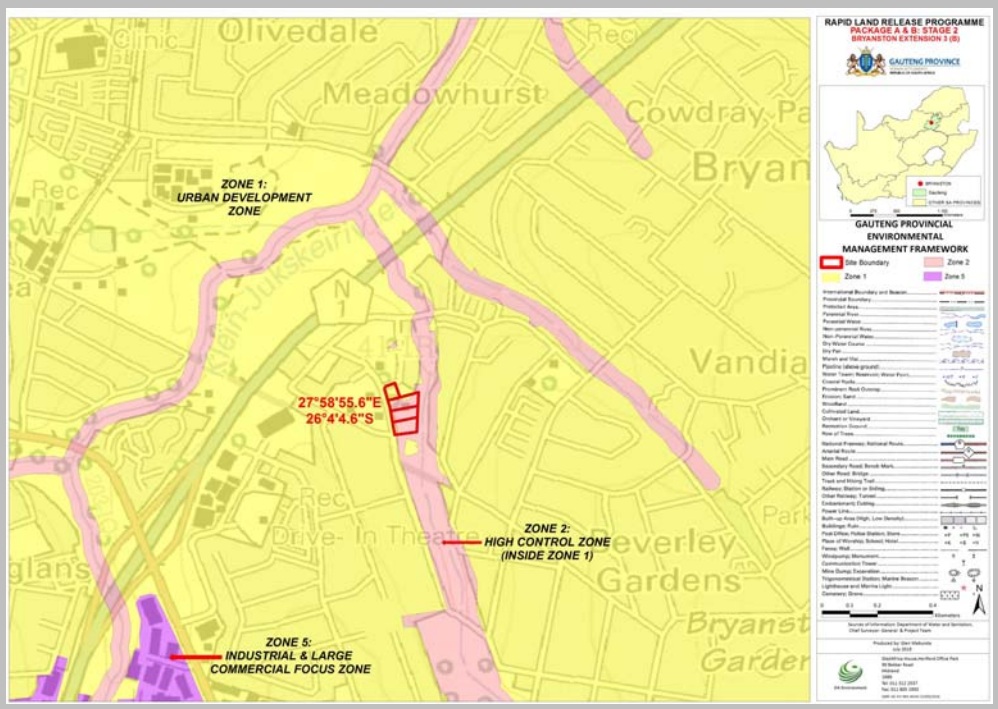


Figure 9: Site location as per the GPEMF

The bouldered rocky outcrop and woodland vegetation units provide habitat for a fair diversity of indigenous trees species, and considering the ecological setting as outlined above, are also considered to be of increased floral ecological importance. Should development within these areas be approved, it is important that edge effects be strictly managed to avoid negative impacts on the rocky grassland vegetation that may lead to habitat degradation.

It is also further recommended that the open space greenbelt situated along the Bryanston River is conserved and only recreation activities are allowed in this area.

Geology & Soils

The geology of the study area is made up of granodiorite (porphyritic in places), gneiss, migmatite which is commonly referred to as the Halfway House Granite. Topographically, the site slopes moderately at 1:14 or 7% towards the east and drains into a tributary 15 m away along the eastern boundary. The site is highly vegetated with dense trees along the western boundary. The topography is described as undulating hills and plains. The most important consideration in relation to the proposed development is the possible presence of collapsible colluvium and residual soils as well as isolated shallow to outcropping granite bedrock. Archaean Granite and Gneiss of the Halfway House granites at the core of the Johannesburg Dome dominate Egoli Granite Grassland geology. Much of the granitic and gneissic rocks of the Johannesburg Dome are exposed in this grassland type (Bredenkamp *et al*., 2006).

No groundwater seepage occurred on site in any of the test pits, although during summer months and during times of prolonged or heavy rainfall, it may be assumed that a perched groundwater table may be present at relatively shallow depths over the site. Foundations of previous structures were seen in the central portion of the site whereas no drainage paths were noted on site. Please refer to **Appendix G1** for the Geotechnical report undertaken and the table below for a summary of available published geological information on the site.

Table 4: Summary of available geological information

Parameter	Value	Reference
Development	NHBRC Phase 1 Housing Dev.	Glad Africa & GDHS
Site coordinates	26° 4’4.22”S/ 27°58’55.53”E	Glad Africa & GDHS
Weinerts N-value	2-5	Weinert (1974)
Climatic Region	Moderate	TRH 2 (1978)
Rainfall	600-650 mm	2526 Johannesburg (1999) 1:500 000 scale
Temperature	0.1 ˚C – 27.5˚C	after DWAF (1986)
Evaporation	1670 mm	After DWAF (1986)
Water Balance	Deficit	Schulze (1985)
Weathering Type	Slight disintegration, moderate decomposition with frost action & very slight weathering.	Fookes et al (1971)
Geology	Granite of the Halfway House Granite Formation.	Geological Map Series: East Rand-2628 (1986) 1:250 000 scale

Soil Cover	Narrowly graded fersiallitic sands and loams, aeolian sand, mainly red.	Brink (1985)
Origin	Transported and residual soils	Brink (1985)
Topography	1:14 or 7%	Garmap SA Topo & Rec 2012.1
Drainage	Not well defined	Garmap SA Topo & Rec 2012.1
Drainage Region	Quaternary Catchment: C23J	DWAF (1999)
Hydrogeology	D3: Intergranular & fractured / 0.5-2 l	1:500 000 scale
Groundwater depth	Unknown	DWAF-WRC (1995)
Erodibility Index	16-20 – Low	WRC (1992)
Seismic Intensity	VI (MMS)	Fernandez et al (1972)
Liquefaction	Likely (100-200 cm/s2)	Welland (2002)
Hydrogeology	D3: Intergranular & fractured / 0.5-2 l	1:500 000 scale

Faunal and Floral diversity

According to the information taken from various specialist reports undertaken during the Basic Assessment, the area falls within the Mesic Highveld Grassland Bioregion of the Grassland Biome and the Egoli Granite Grassland vegetation type, which is listed as an Endangered ecosystem (GN1002, 2011). However, all of this has been changed due to agricultural and urban developments. Much of the study area (southern and central portions) is located in a Critical Biodiversity Area (CBA) and is regarded as an Important Area due to the primary vegetation and orange listed floral species habitat in the study area. The site is located within a Class 4 ridge per the 2019 as per the Gauteng Ridge Guideline and incorporates an Important Critical Biodiversity Area (CBA), largely designated as such in terms of potential floral features. This CBA is connected to a larger CBA associated with the Klein-Jukskei River north of site, via a CBA and Ecological Support Area (ESA) corridor. Please refer to **Figure 10** below.

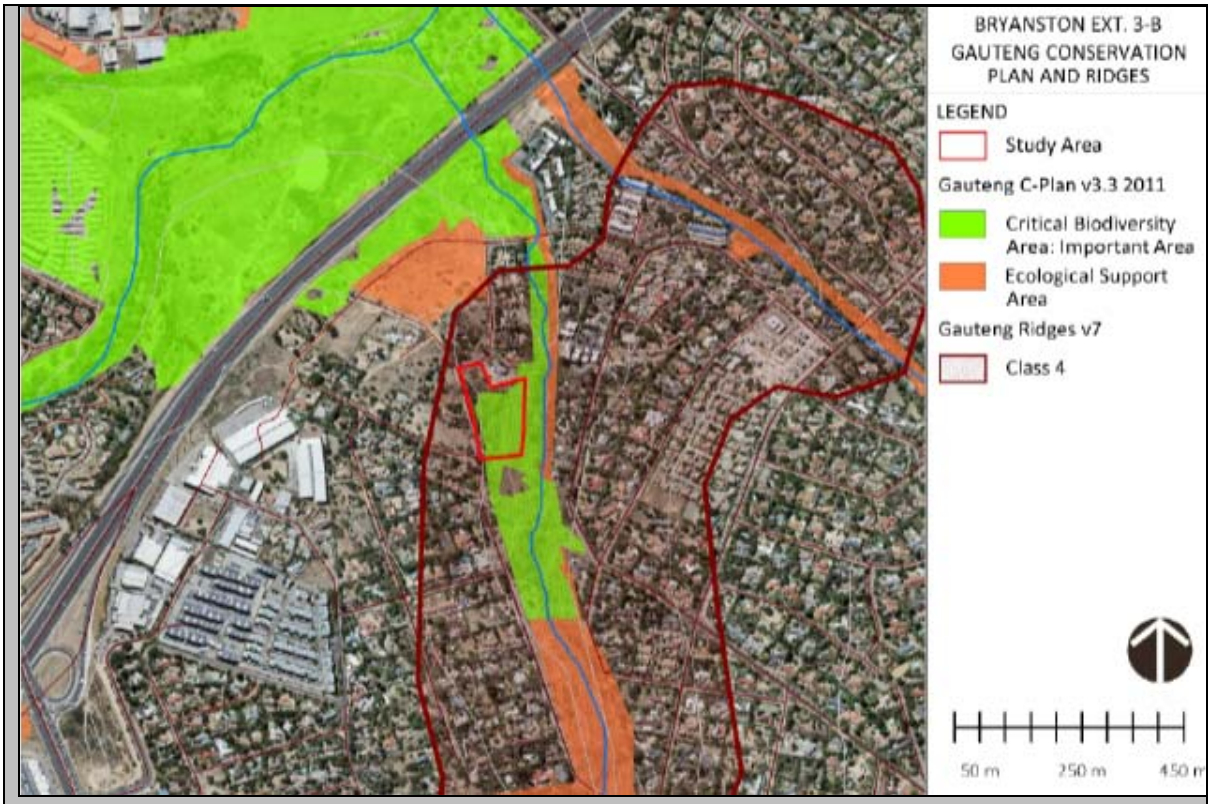


Figure 10: CBAs, ESAs and ridges, in the vicinity of the study area as indicated by the Gauteng C-Plan (2011)

Four broad vegetation units that includes the Rocky grassland, bouldered rocky outcrop, indigenous woody vegetation. Modified vegetation unit were identified with the study site. Much of the study area is characterised by natural rocky grassland vegetation, which mainly occurs within the eastern portion, refer to **Figure 11.** Development within these vegetation unit will impact on the current ecological condition.

Figure 11: An example of a rocky grassland vegetation within the site (Field and form, February 2020)

The rocky grassland vegetation unit provides habitat for a high diversity of indigenous grassland species and is considered to be largely representative of the Endangered (EN) Egoli Granite Grassland vegetation type. A high number of *Hypoxis hemerocallidea* occur throughout this habitat unit and

were confirmed during the site assessment.

A prominent rocky outcrop **(Figure 12)** comprising large boulders is located within the north western portion of the study area **(Figure 7).** This landscape feature provides habitat for several indigenous woody species, including species such as *Ficus ingens, Akocanthera oppositifolia and Vangueria infausta* which was not recorded elsewhere within the study area.

Figure 12. Bouldered Rocky Outcrop vegetation unit within the north western portion of the study area.

Rocky habitat occurs along the streambanks, providing habitat for various *Cyperus spp*. And indigenous forb species, including the orchid species *Eulophia ovalis var. bainsii and Bonatea speciosa*, both of which are protected. According to the Terrestrial Fauna & Avifauna Biodiversity Impact Assessment Report, the site supports a good variety of habitats, with the stream providing flowing water through a rocky area and also contained pools of quieter water. These large rocky oppies composed of large boulders. Soils were largely sandy loams which are utilised by several burrowing species with grainy, shallower sands around the rocky areas. The site and immediate surrounds therefore support a good variety of habitats and micro-habitats and, due to the heterogeneity in habitat and the connectivity between these habitats, fauna biodiversity is expected to be very good, considering the urban nature of the region.

The Woodland vegetation **(Figure 13)** occurred along the stream and also up-slope of the stream near the residential road and was noted to be composed of indigenous, exotic, and alien invasive trees and provided tall and dense arboreal habitats.

Figure 13: Example of land woodland vegetation unit noted on north western portion of the site

The main development footprint adjacent to the stream provided open grassland, interspersed with a variety of rocky habitats, largely bedrock and shallow rocky ridges. Termite mounds were prevalent within the grassy areas.

The site support limited Threatened or Protected mammals and avifaunal species. The Avifaunal specialist identified a list of 44 species during the site assessment. The most notable observation was of the African Finfoot at two locations along the river system. Small passerine species that are common to this area were also identified during the assessment. These species will obviously be disturbed and displaced during the construction. It is the recommendation of the Avifaunal specialist that greenbelts area such as the Arboretum be preserved as these are extremely important to the ecological health of any given region. These corridors, according to the avifaunal specialist finding provide the necessary breeding, roosting and foraging resources to support a diversity and density of avifaunal species and the preservation of these areas is a necessity. **Figure 14** is a map showing the vegetation units within the study site to support the avifaunal and faunal habitats identified on site.

Figure 14: Vegetation units identified within the vicinity of the study area

No tree species protected under the National Forest Act (Act No. 84 of 1998) or Threatened or Protected Species (TOPS) floral species as provided for in terms of the National Environmental Management: Biodiversity Act (Act No. 10 of 2004) (NEMBA) were encountered within the study area during the field assessment by the Flora Specialist.

An enquiry to the Gauteng Department of Agriculture and Rural Development (GDARD) regarding the potential presence of nationally and provincially threatened and near threatened species, indicated that no such species are currently known to occur within the study area or within 5km thereof.

Details findings of the Floral Impact Assessment is attached as **Appendix G2**, b) Terrestrial Fauna & Avifauna Biodiversity Impact Assessment **(Appendix G3)** whereas the Avifaunal Impact Assessment is attached as **Appendix G4.**

Hydrological conditions

The site is located within quaternary catchment A21C of the Limpopo Water Management Area (WMA-1). According to the information taken from the Water Resource Assessment report **(Appendix G5),** the watercourse in the project area includes a tributary of the Klein-Jukskei River which has its confluence with the Klein-Jukskei approximately 800m downstream and eventuates into the Crocodile River **(Figure 15).** The Ferndale stream, a tributary of the Klein Jukskei River, passes on the eastern edge of the study area, flowing from south to north. The Present Ecological State of the system was rated as largely modified, which was an increase in category to the Klein-

Jukskei River, indicating the tributary contributed to habitat and biotic integrity of the catchment. The site is within an Upstream National Freshwater Priority Area (NFEPA) Catchment. No NFEPA Wetlands occur on site and the nearest NFEPA Wetlands are more than 2km from site.

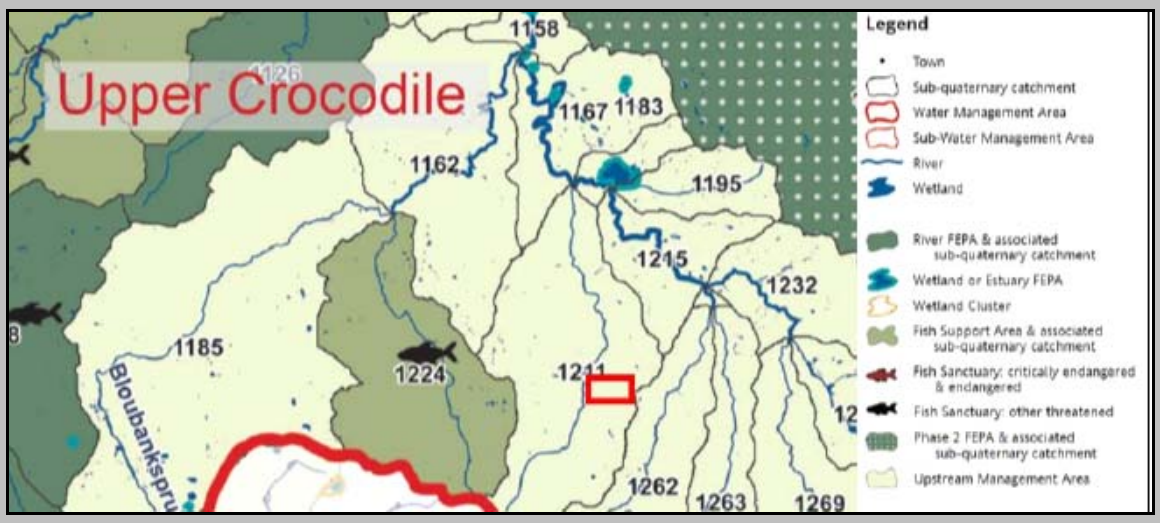


Figure 15: Illustration of NFEPAs associated with the Bryanston Housing Development

Desk top assessment by the specialist indicated that the Present Ecological State of the Jukskei Sub-quaternary catchment is in a seriously modified state, with the Ecological Importance being low, and the Ecological Sensitivity being moderate. According to the specialist, this could be as a result of degradation caused by sewage which was observed entering the system within the project area, which would have a limiting effect to the local aquatic biota.

Two hillslope seeps were identified within proximity of the proposed project area and have been grouped into one Hydrogeomorphic (HGM) unit), namely HGM 1. The northern-most seep impedes into the proposed project area whilst the most southern of the two seeps is intersected by a footpath and is located approximately 100 m south of the proposed project area, please refer to **Figure 16**.

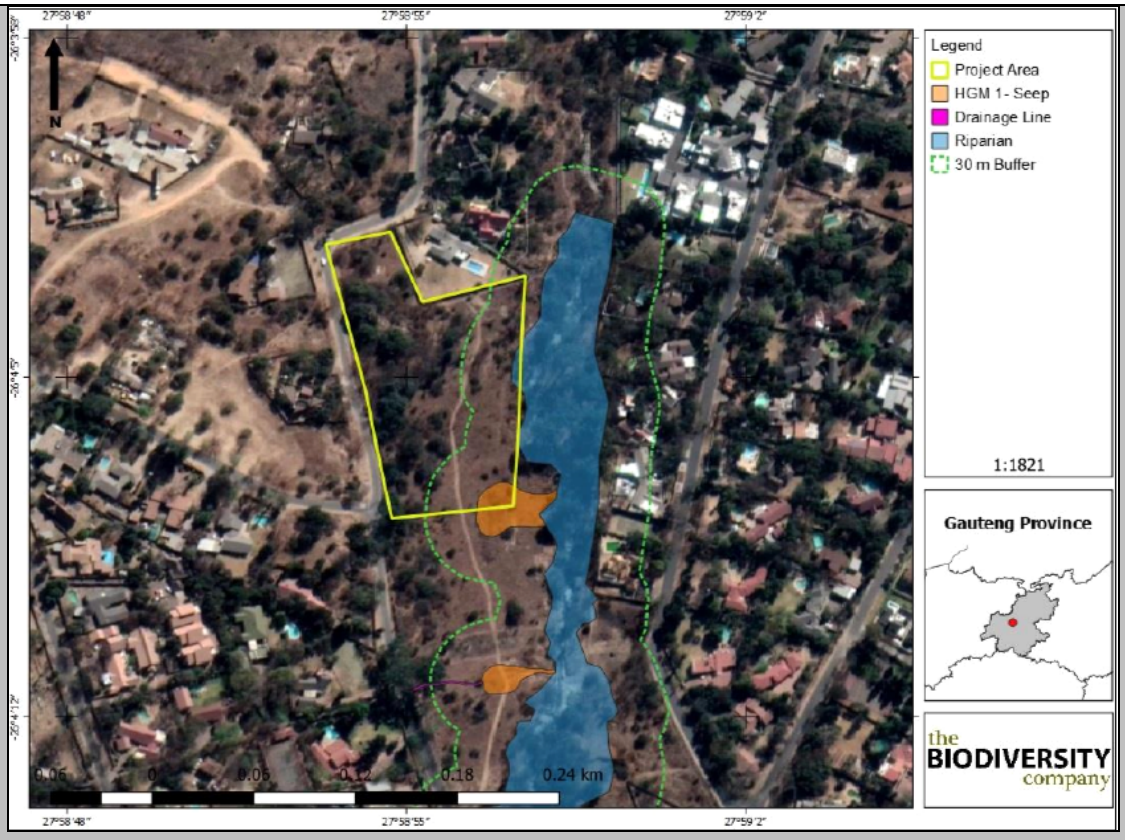


Figure 16: Delineation of wetlands within the 500m regulated area (The Biodiversity Company, 2020)

It is noted from this image that the proposed Bryanston development footprint encroaches into the delineated riparian zone and wetland area and it was a recommendation of the Water resource assessment specialist that a buffer of 30m be kept in order to ensure the preservation of watercourses. The layouts provided has incorporated this requirement in the designs.

A flood line determination study was also undertaken as part of this Basic Assessment. The aerial extent of the flood lines shows that the Bryanston Ext. 3B housing development does not fall within the flood lines and is therefore safe from any flood impacts.

Heritage and Palaeontology baseline

The cultural landscape qualities of the region essentially consist of two components. The first is a rural area in which the human occupation is made up of a pre-colonial Stone Age and Iron Age element, as well as a much later colonial (farmer and industrial) component. The second component, although much younger, is an urban one, which rapidly expanding. During the heritage assessment, no sites, features or objects of cultural significance were identified, however the site was found to fall within a palaeontological sensitive area which indicate that the study area has a moderate possibility of fossil remains that could be found. According to Fourie (2019) the proposed development is underlain by the Bushveld Complex rocks (3G1) and it has a very low palaeontological sensitivity, therefore a low possibility that significant fossils will be present in the bedrock of these geological units. The Heritage Assessment report is attached as **Appendix G6**.

Select the appropriate box

The application is for an upgrade of an existing development		The application is for a new development	√	Other, specify	

Does the activity also require any authorisation other than NEMA EIA authorisation?

YES	NO

If yes, describe the legislation and the Competent Authority administering such legislation

1. National Water Act, 1998 (Act No. 36 of 1998) - Department of Water and Sanitation (DWS). The proposed development is located within 500meters of the Bryanston Rover which is a regulated area and a Water Use Authorisation is required in terms of Section 21 (c) and (i) of The National Water Act, Act No 36 of 1998.
2. Application for rezoning in terms of Section 21 of the City of Johannesburg's Municipal Planning By-Law, 2016; and
3. Application for consolidation in terms of Section 33 of the City of Johannesburg's Municipal Planning By-Law, 2016 in order to consolidate Erven 3975, 3976, 3977 and 3978 Bryanston Extension 3 to create a single site assembly with a total extent of 13,619m².

If yes, have you applied for the authorisation(s)?	YES	NO
If yes, have you received approval(s)? (attach in appropriate appendix)	YES	NO

2. APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES

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

Title of legislation, policy or guideline:	Administering authority:	Promulgation Date:
Constitution of the Republic of South Africa (Act No. 108 of 1996)	National	18 December 1996
National Environmental Management Act, 1998 (Act No. 107 of 1998 as amended) *(i) Environmental Impact Assessment (EIA) Regulations (GN R982 of 2014) [as amended]*	National & Provincial	09 December 2014
Public Participation guideline in terms of NEMA EIA Regulations	National	2017
Promotion of Access to Information Act, 2000 (Act No. 2 of 2000)	National	2 February 2000

Protection of Personal Information Act (POPI Act)	National	2013
Integrated Environmental Management: Guideline on Need and Desirability	National	2017
National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) *(i) Alien and Invasive Species Regulations (R598 of 2014)*	National & Provincial	7 June 2004
National Environmental Management: Waste Act (Act No. 59 of 2008)	National	10 March 2009
The National Water Act, 1998 (Act No. 36 of 1998)	National & Provincial	26 August 1998
General Notice 509, The National Water Act, 1998 (Act No. 36 of 1998)	National & Provincial	26 August 2016
The National Water Act, 1998 (Act No. 36 of 1998) General Notice 276 – Regulations for Water Use Licence Applications and Appeals	National & Provincial	24 March 2017
National Heritage Resources Act, 1999 (Act No. 25 of 1999)	National & Provincial	28 April 1999
Spatial Planning and Land Use Management Act (Act No. 16 of 2013)	National	5 August 2013
City of Johannesburg Spatial Development Framework (JSDF) and Integrated Development Plan (IDP)	Local	2040 and 2018/19
The Gauteng Draft Red Data Policy	Provincial	2001
GDARD Conservation Plan, Version 3.3	Provincial	October 2014
GDARD Requirements for Biodiversity Assessments (Version 3, 2014)	Provincial	March 2014
Gauteng Provincial Environmental Management Framework of 2014	Provincial	2014
GDARD Ridges Guideline	Provincial	2019
The City of Johannesburg Land Use Management By-Law	Local	2 March 2016
Johannesburg Built Environment guidelines and Standards	Local	2014
Johannesburg Metropolitan Open Space Policy	Local	2004
City of Johannesburg Public Open Spaces By-laws	Local	2004
Section 108 of the Town Planning and Townships Ordinance, 1986 (Ord. 15 of 1986).	National & Provincial	18 December 1986

The Municipal Systems Act, 2000 (Act No. 32 of 2000) and the Integrated Development Plans (IDP)	National & Provincial	20 November 2000
National Road Traffic Act (Act No. 93 of 1996)	National	22 November 1996
Occupational Health and Safety Act, 1993 (Act No. 85 of 1993)	National	23 June 1993
Construction Regulations	National	2014
Basic Conditions of Employment Act (Act No. 75 of 1997)	National	1997

Description of compliance with the relevant legislation, policy or guideline:

Legislation, policy of guideline	**Description of compliance**
Constitution of the Republic of South Africa (Act No. 108 of 1996)	Section 24 of the Constitution provides the overarching environmental legislative framework for environmental management. It aims to ensure that everyone has the right to an environment that is not harmful to their health or well-being and the environment is protected for the benefit of present and future generations, through reasonable legislative and other measures. The Applicant has the overall responsibility to prevent pollution and ecological degradation throughout the lifecycle of the proposed development and protect the environment for the benefit of present and future generations. During the construction phase of the project will be managed in accordance with the requirements of the EMPr to ensure that social and environmental management considerations are taken into account and implemented throughout.
National Environmental Management Act, 1998 (Act No. 107 of 1998 as amended) [NEMA]. (i) Environmental Impact Assessment (EIA) Regulations (GN R982 of 2014) [as amended]	The NEMA provides for effective and co-operative environmental governance by means of developing principles that guide the decision-making with matters concerning the environment. Section 28(1) of the Act require every person who causes or may cause significant pollution or degradation of the environment to take reasonable measures to prevent or minimize such pollution or degradation from occurring or recurring. The Applicant is complying with the provisions of this Act through the application for Environmental Authorisation of relevant listed activities as per Section 24 of the Act. In compliance with Section 28, an EMPr has been compiled to provide a framework within which the environmental impacts / pollution associated with construction activities will be managed or mitigated.

Public Participation guideline in terms of NEMA EIA Regulations (2017)	This guideline provides information on the Public Participation requirements of the Act. It further provides information on the characteristics of a vigorous and inclusive Public Participation Process (PPP). In line with the requirements of this guideline, the PPP has thus been structured to provide I&APs with an opportunity to gain more knowledge about the proposed project, to provide inputs/ comments through the review of the environmental reports/ documents at various stages of the BA Process. Inputs from all the stakeholders will thus be taken into consideration in a manner that compliments and enhances the benefits of the project.
Promotion of Access to Information Act, 2000 (Act No. 2 of 2000)	This Act gives effect to the constitutional right of access to any information held by the State and any information that is held by another person and that is required for the exercise or protection of any rights. To comply with the requirements of this Act, all documents relating to the BA Process will be made available to the public and relevant authorities at the different spheres of Government.
Protection of Personal Information Act (POPI Act)	The Protection of Personal Information Act (or POPI Act) sets some conditions for responsible parties (called controllers in other jurisdictions) to lawfully process the personal information of data subjects (both natural and juristic persons). To comply with the requirements of this Act, all personal information (emails, contact numbers, address) have been blanked out and excluded from Public Participation section and will only be provided to GDARD officials who do not require consent to receive such information in the performance of their official duties.
Integrated Environmental Management Guideline: Guideline on Need and Desirability (2017)	This Guideline outlines the principles of sustainability that must be considered for a development that triggers the EIA Regulations. This implies taking into consideration the social, economic and ecological needs equitably throughout the project lifecycle. These factors ultimately allow for strategic decision-making concerning the development. Section E.9 of this report provides the context within which the need and desirability of the proposed activity should/ will be considered.
National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) [NEM:BA]	NEM:BA provides for the management and conservation of South Africa's biodiversity and natural resources in a sustainable manner within the framework of the NEMA. The Act lists all the protected species and identifies restricted activities involving threatened or protected species. Associated with the Act are the Alien Invasive Species Regulations which

	provide for monitoring, control and eradication strategies for the alien invasive species. In accordance with the Act, the Applicant has the responsibility to eradicate alien invasive species and conserve all species of concern or sensitive species (if any) on site during the construction and operational phases of the development through the application of appropriate environmental management tools and/or strategies.
National Environmental Management: Waste Act (Act No. 59 of 2008)	This Act aims to regulate waste management to protect human health and the environment by putting measures in place to prevent pollution and ecological degradation; promote conservation; and secure ecologically sustainable development and use of natural resources. The Applicant shall ensure compliance with this Act by implementing practical measures to avoid or reduce unnecessary generation of waste and where the waste is generated measures such as re-using, recycling and recovery of waste shall be encouraged. These general principles of responsible waste management are also to be incorporated in the EMPr to manage waste-related activities during construction.
National Heritage Resources Act, 1999 (Act No. 25 of 1999) [NHRA]	The NHRA provides for nurturing and conservation of cultural heritage resources. The Act further states that no cultural heritage resources may be disturbed without authorisation from the relevant heritage authority. In compliance with the provisions of this Act a Heritage Screening has been undertaken and no features of heritage importance were identified on the proposed site. The recommendations of the Heritage Specialist have been incorporated into the EMPr which will be implemented during the construction phase of the project.
Spatial Planning and Land Use Management Act (Act No. 16 of 2013) [SPLUMA]	This Act facilitates land development and land use management at the different spheres of Government. The Applicant shall ensure compliance with this Act by engaging the relevant authorities to apply for the rezoning of the affected erven in line with the Town Planning Scheme of the City of Johannesburg as well as its Spatial Development Framework.
National Forests Act (Act No. 84 of 1998)	The removal or destruction of certain protected species will require a permit in terms of Section 12(d) of the National Forests Act No. 84 of 1998, and as such before any clearing of vegetation or construction activities take place this must be applied for an approved.

Gauteng Provincial Environmental Management Framework of 2014	The Gauteng Provincial Environmental Management Framework (GPEMF) has been used to assist in the determination of land use zones and to guide sustainable land use management. According to the GPEMF, the proposed site is zoned as Zone 1 and Zone 2. Erf 3978 is located within zone 1 which according to the GPEMF is reserved for infill development whereas the remaining 3 erven located south of this Erf fall within a high control zone (Zone 2) which is an area reserved for conservation and related recreation activities
National Road Traffic Act (Act No. 93 of 1996)	This legislation regulates all the national roads and issues pertaining to road safety in South Africa. The Applicant shall ensure compliance with relevant provisions of this Act by maintaining all construction vehicles transporting equipment and material to and from the construction site. The construction-related activities that could impact negatively on the normal traffic flow and conditions of public roads must be managed throughout the construction phase by implementing appropriate traffic calming measures.
Occupational Health and Safety Act, 1993 (Act No. 85 of 1993)	This Act provides for protection of workers/staff who might be exposed to health and safety hazards in their work environment. Section 8 states that every employer shall provide and maintain, as far as is reasonably practicable, a working environment that is safe and without risk to the health of the employees. Section 17 further obliges every employer who has more than 20 employees in the workplace to appoint a health and safety representative for such workplace. The Applicant shall ensure compliance with this Act by appointing a qualified health and safety agent to monitor site activities concerning health and safety of the workers and the general public during construction.
Basic Conditions of Employment Act (Act No. 75 of 1997)	The aim of this Act is to give effect to and regulate the right to fair labour practices conferred by section 23(1) of the Constitution by enforcing basic conditions of employment and regulating the variation of basic conditions of employment. The provisions of this Act must be complied with by the Applicant through responsible labour employment through the relevant local authority/ committees, enforcement of employment policies, practices and/or specifications relating to remuneration, training, leave, working hours and termination of employment, etc.

3. ALTERNATIVES

Describe the proposal and alternatives that are considered in this application. Alternatives should include a consideration of all possible means by which the purpose and need of the proposed activity could be accomplished. The determination of whether the site or activity (including different processes, etc.) or both is appropriate needs to be informed by the specific circumstances of the activity and its environment.

The no-go option must in all cases be included in the assessment phase as the baseline against which the impacts of the other alternatives are assessed. **Do not** include the no go option into the alternative table below.

Note: After receipt of this report the competent authority may also request the applicant to assess additional alternatives that could possibly accomplish the purpose and need of the proposed activity if it is clear that realistic alternatives have not been considered to a reasonable extent.

Please describe the process followed to reach (decide on) the list of alternatives below

The guiding principles adopted in the development of feasible alternatives were as follows:

1. *Use of vacant available state land - The proposed site is fully owned by the GDHS.*
2. *Sense of place – Ensure that the development would match the characteristics of Bryanston Extension 3.*
3. *Permeability - residential areas should be permeable enough to allow movement in all directions but no more. The over-provision of poorly used permeability is a crime hazard.*
4. *Human Scale- Development aimed at the satisfaction of fundamental human needs. What would be required is a Human Centred Design that is optimized for human use to illicit the best response from human users in the development of urban spaces.*

Following a Desktop Environmental assessment of the site, two types or categories of alternatives were considered namely design layout alternatives, and technology alternatives (Rock Blasting methods). It is a requirement of any EIA process that a 'No Go' or 'No Project' alternative be considered as part of the Environmental Impact Assessment. Four design layout alternatives for the construction of the proposed Bryanston 3B housing development were considered. These Design Layouts are presented in this report as Proposed and Preferred Alternative, Alternative 1 (2nd preferred), Alternative 2 (3rd preferred) and the least preferred is Alternative 3. These layout alternatives were based on the design and environmental constraints encountered during the Basic Assessment process. It is noted that the site is located in a sensitive ecological environment and therefore the project has considered technology alternatives in order to determine the most suitable technological or blasting process that can be considered during the construction process as the site is located within a ridge. Other limitations that informed the designs were Rocky Outcrop, 100-year Flood line and the 30-meter Wetland buffer. The designs of the housing units also considered other factors such as available land to develop as per the height restrictions and to ensure the finish is in line with other developments in the area.

The alternatives considered are briefly described on page overleaf and further assessed in Section 6 to 8 of this report. Conceptual layouts considered are provided in ***Appendix C****. No site alternatives are proposed for this project as the site has been identified as being highly desirable in line with the mandate of the Rapid Land Release Programme, which seeks to make use of vacant state-owned land. Several specialist investigations were undertaken to identify and describe potential impacts associated with the proposed development. The findings of these specialist studies have been also used to inform the design considerations of the Bryanston 3B development and these are presented in the alternatives considered.*

.

3.1. Design Layout

The proposed housing development, including its associated infrastructure (i.e. internal roads, etc.), is expected to have a development footprint of approximately 1.4 hectares. The site is however located in areas of medium to high Ecological Sensitivity. Key sensitivities identified included the high ecological sensitivity areas associated with the surrounding water courses, rocky grasslands, existing rocky outcrops and woodland vegetation units. The layouts presented have already incorporated the 30-meter buffer as per the recommendation of the Water resource specialists. The sensitivity layers of the Ecological specialists (flora, fauna, avifauna, wetland) have been superimposed on the design layouts. **Figure 17** is an illustration of Alternative 2, designed to ensure development is maximised in all areas where it is technically possible to develop.

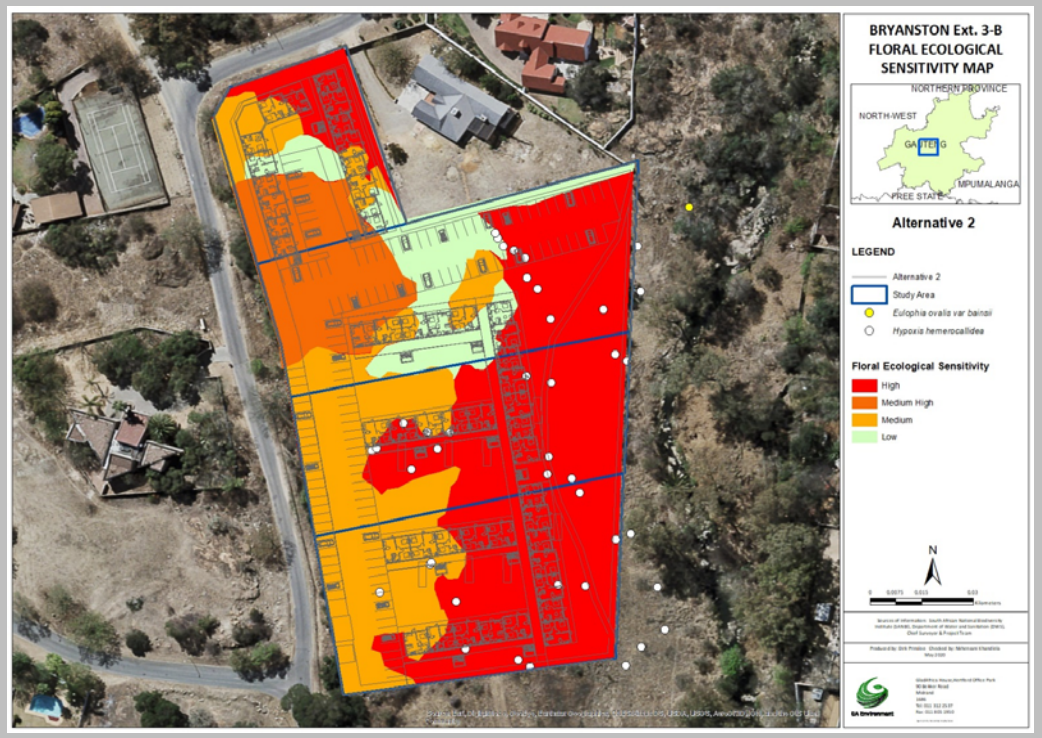


Figure 17: Layout alternative 2 (3rd preferred) highlighting ecological sensitivities

The proposal will ensure that the Bryanston river and its riparian zone are avoided and all units are located outside the 1:100-year flood line. **Figure 18** below is a presentation of Alternatives 1 and 3.

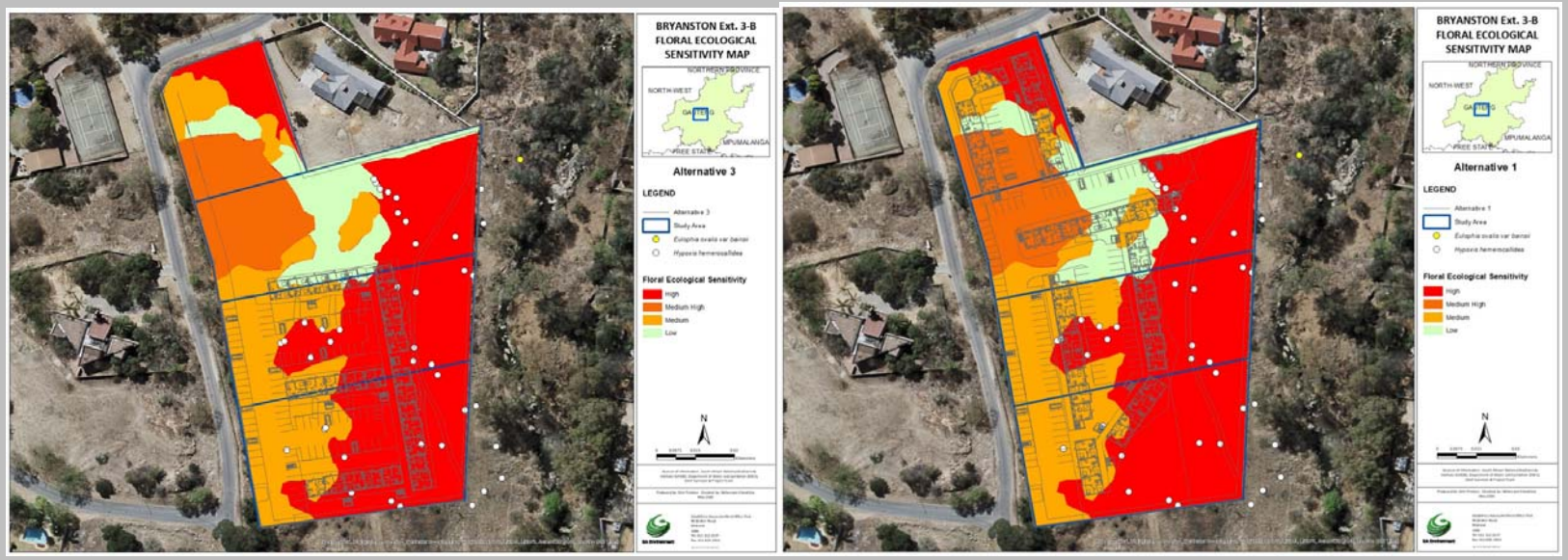


Figure 18: Alternative 3 (least preferred) and Alternative 1 (2nd preferred)

Layout Alternative 1 encroaches slightly into the wetland buffer and includes the construction of housing units on the rocky outcrop that will require blasting whereas Alternative 2 has significantly encroached into the 30m wetland buffer up to the 1 in 100-year floodline. Another difference between the two layouts is the number of units and the orientation of the blocks.

Alternative 3 (Refer to **Figure 18**) has excluded the rocky outcrop located to the south western portions of the site, an area of medium to high sensitivity. The rocky outcrop site could be used as public open space. Although this layout takes into consideration the rocky outcrop, which may contain unique habitats and the presence of many species, it will result in the construction of fewer units (108) against a maximum of 247 that is proposed in the other alternative designs.

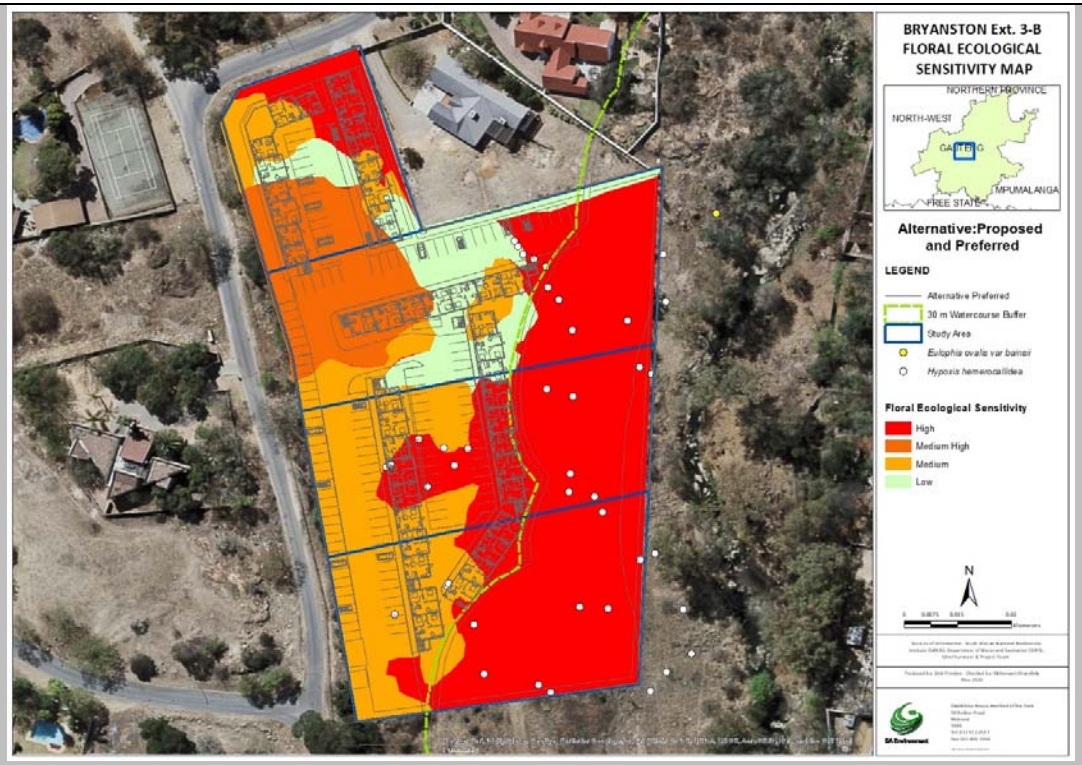


Figure 19: Proposed and Preferred Layout Plan

It must be noted that the layout alternatives considered lie in an area of high sensitivity as the site forms part of a conservation area which is regarded as a green belt. The Preferred layout (**Figure 19**) is located in areas of medium to high sensitivity due to the floral and ecological habitats known to be existing on site. The proposed housing units are located in the modified rocky grassland vegetation unit which covers an area of about 7,000m^2. Some of the housing units will be in the bouldered rocky grassland which is of medium sensitivity and covers an area of about 2,000m$_2$. About 4,350m$_2$ of the woodland vegetation unit which is of medium sensitivity (due to the indigenous woody vegetation) will be affected, with only about 1,250m$_2$ regarded as an area of low sensitivity, as the vegetation is partially modified. This layout does not encroach into the wetland buffer and therefore has little impact on the Bryanston river and riparian vegetation. Parking and development will be concentrated on the western edge of the site where alien species encroachment has modified up to 20% of the site.

It is notable that all proposed layouts including the Preferred will have an impact due to the irreplaceable loss of critical biodiversity as identified by the Floral Impact Assessment Specialist and the Gauteng Conservation Plan (C-Plan). The watercourses, as well as their buffer zones, are considered ecologically sensitive. This Table below is a brief comparative assessment of the design layout alternatives.

Table 5: Comparison of layout alternatives

Proposal (Preferred)	Alternative 1 (2nd preferred)	Alternative 2 (3rd preferred)	Alternative 3 (Least Preferred)
• 184 housing units • 144 Parking Bays • Building footprint of 2,995m^2 • Roads/Parking 4,255m^2 • Open space 6,540m^2 • Located outside the 30-metre wetland buffer • No direct impact on Bryanston river or surrounding watercourses • Has impact on areas of high- (Rocky grassland), medium-high (rocky outcrop) and medium sensitivity (woodland) • May require relevant permit for relocation of species depending on the protection status of the species, prior to the construction phase. • Blasting of rock outcrop is required to accommodate units • Water use authorisation is required.	• 192 housing units • 144 Parking Bays • Building footprint of 3,144m^2 • Roads/Parking 4,270m^2 • Open space 6,280m^2 • Has impact on areas of high- (Rocky grassland), medium-high (rocky outcrop) and medium sensitivity (woodland) • May require relevant permit for relocation of species depending on the protection status of the species, prior to the construction phase. • Blasting of rock outcrops is required to accommodate units. • Slightly encroaches into the 30 metre wetland buffer • No direct impact on surrounding watercourses • Water use authorisation is required. • Significantly encroaches into the 30m wetland buffer and almost lies within the 1 in 100-year flood line.	• 204 housing units • 156 Parking Bays • Building footprint of 3,345m^2 • Road/Parking 4,297 m^2 • Open space 3,250 m^2 • Has impact on areas of high- (Rocky grassland), medium-high (rocky outcrop) and medium sensitivity (woodland) • May require relevant permit for relocation of species depending on the protection status of the species, prior to the construction phase. • Blasting of rock outcrops may be required to accommodate units • Significantly encroaches into the 30m wetland buffer and almost lies within the 1 in 100-year flood line. • Directly impacts on surrounding watercourses • Water use authorisation is required.	• 108 housing units • 97 Parking Bays • Building footprint of 2,045m^2 • Road/Parking 2,483m^2 • Open space 9,068 m^2 • Does not impact on areas of high sensitivity (Rocky outcrop), thus no Blasting of rock outcrops is required to accommodate units. • Has impact on medium-high (rocky grassland) and medium sensitivity (woodland) • May require relevant permit for relocation of species depending on the protection status of the species, prior to the construction phase. • Significantly encroaches into the 30m wetland buffer and almost lies within the 1 in 100-year flood line. • Directly impacts on surrounding watercourses. • Water use authorisation is required.
No-Go			
	The No-Go alternative assumes that the project as proposed does not go ahead. This		

	alternative would result in no environmental impacts on the site or surrounding local area.		

Although the proposed layout alternatives are similar with slight differences in the terms of the layout orientation and total housing units, they are all constrained in attempting to avoid high to medium high sensitive areas. The applicant prefers Alternative 2 as it will result in the maximum possible output of housing units. The Design team prefer the Proposal as it avoids the 1:100 year floodline and is located an additional 30 meters away from the wetland and riparian zones and therefore avoids impacts on the Bryanston River and riparian vegetation. From a flora, fauna and avifauna perspective, all three Layouts (Proposal, Alternative 1 and 2) are not preferred because of the medium to high ecological impacts particularly the irreplaceable loss of habitats. According to the avifauna specialist, all layouts are not recommended as the construction phase will result in disturbance which will result in the migration or mortality of the African Finfoot identified at two locations along the river system. All proposed layouts transect the existing sensitive environment including the Rocky grassland, bouldered rocky outcrop, woodlands, and the Modified grassland. Layout Alternative 3 has less impacts on the rocky outcrop mostly located on Erf 3978 which is within zone 1 where urban infill development is encouraged by the GPEMF. This alternative however has its delimitations as it encroaches into the 30m wetland buffer. Layout Alternatives 1, 2 and 3 encroach into the wetland and impact significantly on the riparian vegetation. These layouts also have a significant impact on the green belt/open space and may result in the modification of this area. These layouts indirectly encroach into delineated wetlands and riparian zones which therefore greatly limits the possibility of mitigation.

The main difference lies in the fact that the preferred/proposed layout takes into consideration the importance of conserving the open space green belt, which is the last remaining portion of the modified ridge classified as a Class IV ridge. The 30-meter buffer ensures that that the proposed development allows an even greater area for the protection of this green belt when compared to developments in the north that have encroached and permanently modified this area. The 30-meter buffer applied to the riparian zone will ensure ecological functions of this contiguous open space are not impacted and will facilitate faunal movement.

3.2. Technological Alternatives (Non-explosive blasting vs Explosive blasting)

The proposed development is located in a rocky grassland area and one of the main characters of the site is the bouldered rock outcrop which is currently providing faunal habitat. Some of the portions of the site will require blasting before the construction of the housing development. Blasting is one of the predominant methods that has been adopted in the construction industry when large boulders are encountered which require rock breaking.

The use of **non-explosive** methods to break rock is now widely used in the construction industry. Rock breaking methods range from the use mechanical forces, physical chemistry, and electrical stimulus to break the stone. The use of Hydraulic breaker and Boring machine are some of the mechanical technologies that can be considered when using non-explosive blasting. Other physical chemistry reacting methods such as static expansion and carbon dioxide cracker can also be considered when complex rocks are encountered. These rock blasting methods are generally regarded as highly efficient and the cost is relatively low, but the impacts from vibration, fly rock, production of toxic gases raise a safety concern. Ideally, if undertaken in a safe manner, rock breaking would have little vibration, no fly rock, and no toxic gases.

Explosives blasting is heavily relied upon in the mining sector because of its efficiency. This method has limitations especially with regard to potential to damage the final excavation line beyond the intended boundary of the blast site. Excessive amounts of overbreak on a rock face can cause several social and safety concerns for adjacent landowners and the local community. The most important of these safety concerns are related to worker and equipment exposure to potential rock fall hazards, cracking of nearby buildings due to vibrations.

It must be noted that both these technologies have their limitations and advantages, and extreme caution must be exercised in their application, depending on the blasting requirements and site constraints. A clear and well-drafted blasting specification must be prepared in consultation with a blasting specialist. This specification must be included in the Tender Document used to procure the Contractor for the early works which will include blasting. The Department of Human Settlements would need to ensure that the Contractor appointed for the construction of the housing development applies the recommended blasting method that has been pre-determined to have the least impact on the site and its surrounding environment.

In the event that no alternative(s) has/have been provided, a motivation must be included in the table below.

Not Applicable

4. PHYSICAL SIZE OF THE ACTIVITY

Indicate the total physical size (footprint) of the proposal as well as alternatives. Footprints are to include all new infrastructure (roads, services etc), impermeable surfaces and landscaped areas:

	Size of the activity:
Proposed activity ***(Total environmental (landscaping, parking, etc.) and the building footprint)*** **[Proposal]**	7,250m^2
Alternatives:	
Alternative 1 (if any) **[Alternative 1]**	7,414m^2
Alternative 2 (if any) **[Alternative 2]**	7,642m^2
Alternative 3 (if any) **[Alternative 3]**	4,528m^2
	Ha/m^2

The footprint of the proposed facility was similar for most of the layout alternatives that were considered for the project.

or, for linear activities:

	Length of the activity:
Proposed activity	Not Applicable
Alternatives:	
Alternative 1 (if any)	Not Applicable
Alternative 2 (if any)	Not Applicable
	m/km

Indicate the size of the site(s) or servitudes (within which the above footprints will occur):

	Size of the site/servitude:
Proposed activity **[Proposal]**	13,617m^2
Alternatives:	
Alternative 1 (if any) **[Alternative 1]**	13,617m^2
Alternative 2 (if any) **[Alternative 2]**	13,617m^2
Alternative 3 (if any) **[Alternative 3]**	13,617m^2

5. SITE ACCESS

Proposal and Alternatives 1, 2 and 3

Does ready access to the site exist, or is access directly from an existing road?	**YES √**	NO
If NO, what is the distance over which a new access road will be built		m

Describe the type of access road planned:

Access for this development was identified from Cork Avenue to the Western side of Erf 3977. It is expected that Cork Avenue will require an upgrade in the form of surfacing and/or construction to accommodate traffic generated by the proposed new development.

Include the position of the access road on the site plan (if the access road is to traverse a sensitive feature the impact thereof must be included in the assessment).

PLEASE NOTE: Points 6 to 8 of Section A must be duplicated where relevant for alternatives

Section A 6-8 has been duplicated | **0** | Number of times

(only complete when applicable)

- ***Point 6 to 8 Section A <u>was not duplicated</u> for the alternatives as the three layout alternatives (Proposal, Alternative 1, 2 and 3) options discussed in section 6.2 do not differ in any significant way as far as the environmental impacts are concerned and are not significantly different in terms of the potential impacts.***
- ***the site maps or plans are attached as Appendix A.***

6. LAYOUT OR ROUTE PLAN

A detailed site or route (for linear activities) plan(s) must be prepared for each alternative site or alternative activity. It must be attached to this document. The site or route plans must indicate the following:

- the layout plan is printed in colour and is overlaid with a sensitivity map (if applicable);
- layout plan is of acceptable paper size and scale, e.g.
  - A4 size for activities with development footprint of 10sqm to 5 hectares;
  - A3 size for activities with development footprint of > 5 hectares to 20 hectares;
  - A2 size for activities with development footprint of >20 hectares to 50 hectares);
  - A1 size for activities with development footprint of >50 hectares);

- The following should serve as a guide for scale issues on the layout plan:
  - A0 = 1: 500
  - A1 = 1: 1000
  - A2 = 1: 2000
  - A3 = 1: 4000
  - A4 = 1: 8000 (±10 000)
- shapefiles of the activity must be included in the electronic submission on the CD's;
- the property boundaries and Surveyor General numbers of all the properties within 50m of the site;
- the exact position of each element of the activity as well as any other structures on the site;
- the position of services, including electricity supply cables (indicate above or underground), water supply pipelines, boreholes, sewage pipelines, septic tanks, storm water infrastructure;
- servitudes indicating the purpose of the servitude;
- sensitive environmental elements on and within 100m of the site or sites (including the relevant buffers as prescribed by the competent authority) including (but not limited thereto):
  - Rivers and wetlands;
  - the 1:100 and 1:50 year flood line;

- ridges;
- cultural and historical features;
- areas with indigenous vegetation (even if it is degraded or infested with alien species);

- Where a watercourse is located on the site at least one cross section of the water course must be included (to allow the position of the relevant buffer from the bank to be clearly indicated)
  - **Refer to Appendix A and C for site plans and facility illustrations.**

FOR LOCALITY MAP (NOTE THIS IS ALSO INCLUDED IN THE APPLICATION FORM REQUIREMENTS)

- the scale of locality map must be at least 1:50 000. For linear activities of more than 25 kilometres, a smaller scale e.g. 1:250 000 can be used. The scale must be indicated on the map;
- the locality map and all other maps must be in colour;
- locality map must show property boundaries and numbers within 100m of the site, and for poultry and/or piggery, locality map must show properties within 500m and prevailing or predominant wind direction;
- for gentle slopes the 1m contour intervals must be indicated on the map and whenever the slope of the site exceeds 1:10, the 500mm contours must be indicated on the map;
- areas with indigenous vegetation (even if it is degraded or infested with alien species);
- locality map must show exact position of development site or sites;
- locality map showing and identifying (if possible) public and access roads; and
- the current land use as well as the land use zoning of each of the properties adjoining the site or sites.

Refer to Appendix A for site plans and layout sensitivity maps.

7. SITE PHOTOGRAPHS

Colour photographs from the center of the site must be taken in at least the eight major compass directions with a description of each photograph. Photographs must be attached under the appropriate **APPENDIX B.** It should be supplemented with additional photographs of relevant features on the site, where applicable.

8. FACILITY ILLUSTRATION

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

SECTION B: DESCRIPTION OF RECEIVING ENVIRONMENT

Note: Complete Section B for the proposal and alternative(s) (if necessary)

Instructions for completion of Section B for linear activities

1) For linear activities (pipelines etc) it may be necessary to complete Section B for each section of the site that has a significantly different environment.
2) Indicate on a plan(s) the different environments identified
3) Complete Section B for each of the above areas identified
4) Attach to this form in a chronological order
5) Each copy of Section B must clearly indicate the corresponding sections of the route at the top of the next page.

Section B has been duplicated for sections of the route | 0 | times

Instructions for completion of Section B for location/route alternatives

1) For each location/route alternative identified the entire Section B needs to be completed
2) Each alterative location/route needs to be clearly indicated at the top of the next page
3) Attach the above documents in a chronological order

Section B has been duplicated for location/route alternatives | 0 | times | (complete only when appropriate)

Instructions for completion of Section B when both location/route alternatives and linear activities are applicable for the application

Section B is to be completed and attachments order in the following way

- All significantly different environments identified for Alternative 1 is to be completed and attached in a chronological order; then
- All significantly different environments identified for Alternative 2 is to be completed and attached chronological order, etc.

Section B - Section of Route | | (complete only when appropriate for above)

Section B – Location/route Alternative No. | | (complete only when appropriate for above)

The proposed development is a footprint development where the study area is located within a property estimated at 1,4 Hectares. Most of the environment is similar throughout the study area

and will therefore be assessed as one area for each alternative, thus the section will not be duplicated.

1. PROPERTY DESCRIPTION

Property Description: (Including Physical Address and Farm Name, Portion etc.)	The project site occupies an area of 1.36 hectares and comprises four Erven, known as Erf 3975 Bryanston Ext. 3, Erf 3976 Bryanston Ext. 3, Erf 3977 Bryanston Ext. 3 and Erf 3978 Bryanston Ext. 3.

2. ACTIVITY POSITION

Indicate the position of the activity using the latitude and longitude of the centre point of the site for each alternative site. The co-ordinates should be in decimal degrees. The degrees should have at least six decimals to ensure adequate accuracy. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection.

Proposal:	**Latitude (S):**	**Longitude (E):**
Alternative 1:		
Alternative 2:	27°58'55.6"S;	26° 4' 4.6 "E°

In the case of linear activities: ***(The proposed development is not a linear activity)***

Proposal:	**Latitude (S):**	**Longitude (E):**
• Starting point of the activity	°	°
• Middle point of the activity	°	°
• End point of the activity	°	°

Alternative 1:	**Latitude (S):**	**Longitude (E):**
• Starting point of the activity	°	°
• Middle point of the activity	°	°
• End point of the activity	°	°

For route alternatives that are longer than 500m, please provide co-ordinates taken every 250 meters along the route and attached in the appropriate Appendix

Addendum of route alternatives attached	

The 21-digit Surveyor General code of each cadastral land parcel

PROPOSAL, ALTERNATIVES 1, 2 & 3	T	0	I	R	0	1	1	4	0	0	0	0	3	9	7	5	0	0	0	0	0
	T	0	I	R	0	1	1	4	0	0	0	0	3	9	7	6	0	0	0	0	0
	T	0	I	R	0	1	1	4	0	0	0	0	3	9	7	7	0	0	0	0	0
	T	0	I	R	0	1	1	4	0	0	0	0	3	9	7	8	0	0	0	0	0

3. GRADIENT OF THE SITE

Indicate the general gradient of the site.

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

4. LOCATION IN LANDSCAPE

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

Ridgeline	Plateau	**Side slope of hill/ridge**	Valley	Plain	Undulating plain/low hills	River front

5. GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE

a) Is the site located on any of the following?

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

(Information in respect of the above will often be available at the planning sections of local authorities. Where it exists, the 1:50 000 scale Regional Geotechnical Maps prepared by Geological Survey may also be used).

b) are any caves located on the site(s) | YES | NO√

If yes to above provide location details in terms of latitude and longitude and indicate location on site or route map(s)

Latitude (S):	**Longitude (E):**
°	°

c) are any caves located within a 300m radius of the site(s) | YES | NO√

If yes to above provide location details in terms of latitude and longitude and indicate location on site or route map(s)

Latitude (S):	**Longitude (E):**
°	°

d) are any sinkholes located within a 300m radius of the site(s) | YES | NO√

If yes to above provide location details in terms of latitude and longitude and indicate location on site or route map(s)

Latitude (S):	**Longitude (E):**
°	°

No groundwater seepage occurred on site in any of the test pits, although during summer months and during times of prolonged or heavy rainfall, it may be assumed that a perched groundwater table may be present at relatively shallow depths over the site. Please refer to ***Appendix G1*** *for the Geotechnical Assessment that was undertaken.*

If any of the answers to the above are "YES" or "unsure", specialist input may be requested by the Department

6. AGRICULTURE

Does the site have high potential agriculture as contemplated in the Gauteng Agricultural Potential Atlas (GAPA 4)?	**YES**	**NO √**

Please note: The Department may request specialist input/studies in respect of the above.

7. GROUNDCOVER

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

Indicate the types of groundcover present on the site and include the estimated percentage found on site

Natural veld - good condition	Natural veld with scattered	Natural veld with heavy alien	Veld dominated by	Landscaped (vegetation)

% = 95	aliens % = 5	infestation % =	alien species % =	% =
Sport field % = 0	Cultivated land % = 0	Paved surface (hard landscaping) % =	Building or other structure % =	Bare soil %

Please note: The Department may request specialist input/studies depending on the nature of the groundcover and potential impact(s) of the proposed activity/ies.

Are there any rare or endangered flora or fauna species (including red list species) present on the site	YES	**NO√**

If YES, specify and explain:

There are **NO** rare or endangered flora or fauna species within the site. However according to the Floral Impact Assessment Report, a high number of *Hypoxis hemerocallidea* occur throughout this habitat unit as shown in **Figure 20**. This species is indicated as *Declining* in Gauteng Province, although it is not nationally listed as Threatened or Near-threatened, due to consistent harvesting for the medicinal plant trade. The study area is located within a nationally listed Threatened Ecosystem, namely the Endangered (EN) Egoli Granite Grassland Ecosystem. The National Biodiversity Assessment (NBA; 2018) is a primary tool for monitoring and reporting on the state of biodiversity in South Africa. The NBA currently indicates the threatened status of this ecosystem as Critically Endangered (CR). A Critically Endangered (CR) ecosystem is defined in the National List of Ecosystems as among those that are Threatened and in Need of Protection (2011) as "ecosystems that have undergone severe degradation of ecological structure, function or composition as a result of human intervention and are subject to an extremely high risk of irreversible transformation".

Figure 20: Floral Ecological Sensitivity identified

The results of the December 2019 and January 2020 field assessments indicate that the rocky grassland vegetation, covering an area of approximately 7,000m², is of high floral ecological sensitivity, partially due to its location within a sensitive ecological setting as described above, and also due to the intact vegetation structure and ecological functioning of this vegetation unit. The species composition of this vegetation unit also indicates that the grassland present is representative of natural or near-natural remnant Egoli Granite Grassland. This Endangered (EN) vegetation type is currently poorly conserved and highly fragmented across its range, with only approximately 22% of its original extent remaining in an untransformed state by 2006 (Bredenkamp *et al.*, 2006), which, considering high rates of urbanisation, is likely to currently be significantly lower.

Since the study area forms part of a larger contiguous open space area, defined by a watercourse and green belt, that is managed by both local authorities and the local residents association as a bird sanctuary and arboretum, its conservation is considered to be viable and essential. It is important to note that encroachment of the grassland areas within the study area (currently still considered to be in a good ecological condition with high conservation value) and surrounding open space area by Pompom weed (*Campuloclinium macrocephalum*) poses an immediate threat and, regardless of whether the proposed project proceeds or not, immediate conservation of the bouldered rocky outcrop and associated woodland within the west of the study area is recommended. The bouldered rocky outcrop and woodland vegetation units provide habitat for a fair diversity of indigenous trees species, and considering the ecological setting, are also considered to be of increased floral ecological importance. Should development within these areas be approved, it is important that edge effects be strictly managed to avoid negative impacts on the rocky grassland vegetation that may lead to habitat degradation.

Are there any rare or endangered flora or fauna species (including red list species) present within a 200m (if within urban area as defined in the Regulations) or within 600m (if outside the urban area as defined in the Regulations) radius of the site.	**YES √**	**NO**

If YES, specify and explain:

The African Finfoot was identified at two locations along the river system. This species occurs widely in sub-Saharan Africa but populations are decreasing. In South Africa the population has decreased by 30% in the last ten years, largely due to habitat degradation - this rapid decrease has resulted in this species being listed as Vulnerable on the regional Red List.

The Bryanston River provides the necessary breeding, roosting and foraging resources to support a diversity and density of avifaunal species.

Are there any special or sensitive habitats or other natural features present on the site?	**YES √**	**NO√**

If YES, specify and explain:

According to the Terrestrial Fauna & Avifauna Biodiversity Impact Assessment Report (**Appendix G3),** the site supported a good variety of habitats, with the stream providing flowing water through a rocky area and also contained pools of quieter water. Woodland vegetation occurred along the stream and also up-slope of the stream near the residential road and consisted of indigenous, exotic and Alien Invasive Species trees with tall and dense arboreal habitats. The main development footprint adjacent to the stream provided open grassland, interspersed with a variety of rocky habitats, largely bedrock and shallow rocky ridges. Termite mounds were prevalent within the grassy areas. The western part of the site was dominated by a rocky koppie with large boulders. Soils were largely sandy loams which are utilised by several burrowing species with grainy, shallower sands around the rocky areas. The site and immediate surrounds therefore support a good variety of habitats and micro-habitats and, due to the heterogeneity in habitat and the connectivity between these habitats, fauna biodiversity is expected to be very good, considering the urban nature of the region.

The site is likely to support limited TOP mammals, but this is not unusual in the urban setting. However, the ecological connectivity and habitat heterogeneity means that TOP mammals could periodically utilise the site, either for foraging or traversing through the site. However, wetland species are, to an extent, dependent on surrounding environments which provide foraging grounds or provide habitat to their primary food source. The findings agree with the Gauteng C-Plan and the area designated as an Important Critical Biodiversity Area (CBA) has been designated as highly sensitive in terms of terrestrial fauna. The highly sensitive area has been extended slightly northwards to encompass the bouldered koppie.

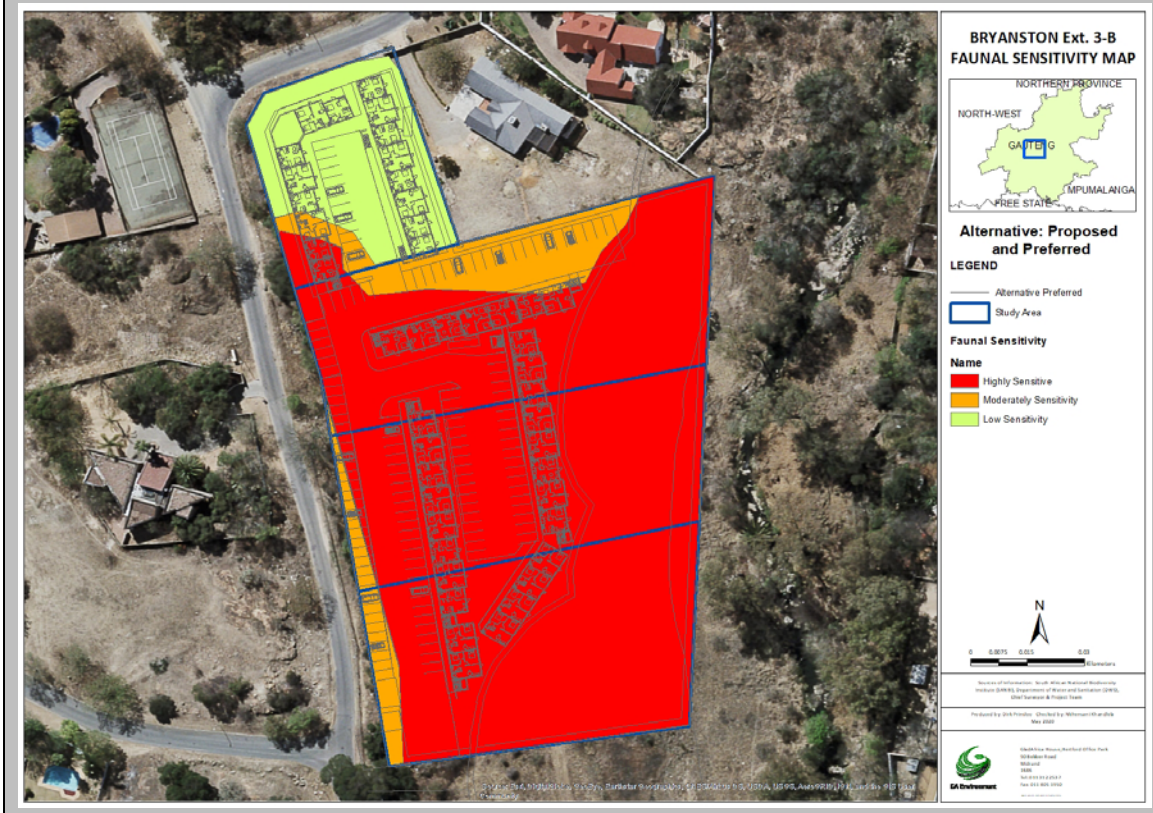


Figure 21: Faunal sensitivity map overlayed on-site plan

Was a specialist consulted to assist with completing this section		**YES √**	NO

If yes complete specialist details

Name of the specialist:	Michelle Pretorius		
Qualification(s) of the specialist:	MSc (Environmental Ecology)		
Postal address:	Lynnro Gardens, 110 Lynnro Avenue, Lynnwood Manor,		
Postal code:	0081		
Telephone:	011 616 7893	Cell:	082 442 7637
E-mail:	michelle@fieldandform.co.za	Fax:	

Are any further specialist studies recommended by the specialist?	YES	**NO√**
If YES, specify:	Not Applicable	
If YES, is such a report(s) attached?	YES	**NO√**

If YES list the specialist reports attached below

Not Applicable

Was a specialist consulted to assist with completing this section		**YES √**	NO

If yes complete specialist details

Name of the specialist:	Megan Diamond		
Qualification(s) of the specialist:	BSc Environmental Management		
Postal address:	P.O Box 786962, Sandton, Johannesburg, Gauteng		
Postal code:	2146		
Telephone:		Cell:	082 683 0970
E-mail:	megan@feathersenv.co.za	Fax:	

Are any further specialist studies recommended by the specialist?	YES	**NO√**
If YES, specify:	Not Applicable	
If YES, is such a report(s) attached?	YES	**NO√**

If YES list the specialist reports attached below

Not Applicable

Was a specialist consulted to assist with completing this section		**YES √**	NO

If yes complete specialist details

Name of the specialist:	Barbara Kasl

Qualification(s) of the specialist:	PhD (Animal, Plant and Environmental Sciences)		
Postal address:	Lynnro Gardens, 110 Lynnro Avenue, Lynnwood Manor,		
Postal code:	0081		
Telephone:	011 616 7893	Cell:	071 988 6773
E-mail:	bk.zoology@gmail.com	Fax:	

Are any further specialist studies recommended by the specialist?	YES	**NO√**
If YES, specify:	Not Applicable	
If YES, is such a report(s) attached?	YES	**NO√**

If YES list the specialist reports attached below

Not Applicable

Was a specialist consulted to assist with completing this section	**YES √**	NO

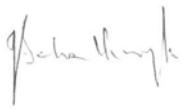
If yes complete specialist details

Name of the specialist:	Dr. J. van Schalkwyk		
Qualification(s) of the specialist:	• DLitt et Phil (Anthropology) • MA (Anthropology) • BA (Hons), Anthropology • Post Graduate Diploma in Museology • BA (Hons), Archaeology		
Postal address:	62 Coetzer Avenue, Monument Park		
Postal code:	0181		
Telephone:		Cell:	076 790 6777
E-mail:	jvschalkwyk@mweb.co.za	Fax:	

Are any further specialist studies recommended by the specialist?	YES	**NO√**
If YES, specify:	During the heritage assessment, no sites, features or objects of cultural significance were identified. However, the site was found to fall within a paleontologically sensitive area, which indicates that the study area has a moderate possibility that fossil remains could be found. According to Fourie (2019), the proposed development is underlain by the Bushveld Complex rocks (3G1) and it has a very low palaeontological sensitivity and therefore a low possibility exists that significant fossils will be present in the bedrock of these geological units.	
If YES, is such a report(s) attached?	**YES √**	NO

If YES list the specialist reports attached below

The Heritage assessment report is attached as **Appendix G6.**

Signature of specialist:  Date: Feb 2020

Please note; If more than one specialist was consulted to assist with the filling in of this section then this table must be appropriately duplicated

8. LAND USE CHARACTER OF SURROUNDING AREA

Using the associated number of the relevant current land use or prominent feature from the table below, fill in the position of these land-uses in the vacant blocks below which represent a 500m radius around the site.

1. Vacant land	2. River, stream, wetland	3. Nature conservation area	**4. Public open space**	**5. Koppie or ridge**
6. Dam or reservoir	7. Agriculture	8. Low density residential	**9. Medium to high density residential**	**10. Informal residential**
11. Old age home	12. Retail	13. Offices	14. Commercial & warehousing	15. Light industrial
16. Heavy industrial[AN]	17. Hospitality facility	18. Church	19. Education facilities	20. Sport facilities
21. Golf course/polo fields	22. Airport[N]	23. Train station or shunting yard[N]	24. Railway line[N]	25. Major road (4 lanes or more)[N]
26. Sewage treatment plant[A]	27. Landfill or waste treatment site[A]	28. Historical building	29. Graveyard	30. Archeological site
31. Open cast mine	32. Underground mine	33.Spoil heap or slimes dam[A]	34. Small Holdings	
Other land uses (describe):	**35. Main Road** **36. Small businesses**			

NOTE: Each block represents an area of 250m X 250m, if your proposed development is larger than this please use the appropriate number and orientation of hashed blocks

NORTH

9	**9/4**	**20**	**9**	**9**

EAST

WEST	9	9/4	4	9	9
	9	5		9	9
	9	36	36	9	9
	35	35	35	35	35

SOUTH

Note: More than one (1) Land-use may be indicated in a block

Please note: The Department may request specialist input/studies depending on the nature of the land use character of the area and potential impact(s) of the proposed activity/ies. Specialist reports that look at health & air quality and noise impacts may be required for any feature above and in particular those features marked with an "A" and with an "N" respectively.

The Department of Forestry, Fisheries and the Environment gave Notice of the Requirement to submit a Report generated by the National Web-based Environmental Screening Tool in terms of section 24(5)(h) of the NEMA, 1998 (Act No 107 of 1998) and regulation 16(1)(b)(v) of the EIA regulations, 2014, as amended. The submission of this report is compulsory when submitting an application for environmental authorisation in terms of regulation 19 and regulation 21 of the Environmental Impact Assessment Regulations. A Screening Report was generated on 23 August 2019 which has been attached as ***Appendix I2*** *of this report.*

The Table below is a summary of the environmental sensitivities within the study area for this application as identified in the Environmental Screening Report and verified on site by the EAP and appointed specialists.

Table 6: Environmental Sensitivity of Project Area (DFFE Screening Tool)

Theme	Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
Agriculture Theme			X	
Aquatic Biodiversity Theme				X
Archaeological and Cultural Heritage Theme		X		
Civil Aviation Theme			X	
Defence Theme				X
Terrestrial Biodiversity Theme	X			

Based on the environmental sensitivities of the proposed project area, the following list of specialist assessments were identified by the Environmental Screening Report. The Specialists studies identified in the table below were undertaken as the proposed construction activities are likely to have an impact on some of the sensitivities of the environment.

No	Specialist Assessment	EAP Statement/Motivation

1	Agricultural Impact Assessment	Although indicated as medium sensitivity, the study area is not located within high potential agricultural land as per the classifications of Gauteng Agricultural Potential Atlas (GAPA) (Refer to Agriculture Potential map attached as **Appendix A**) and therefore an Agriculture Potential Impact Assessment Study is not required.
2	Aquatic Biodiversity Impact Assessment	The Bryanston River is located 40 meters east of the site and has a defined aquatic system and therefore the proposed development will have an impact on Aquatic Biodiversity of the river. A Water Resource Assessment Report has been attached as **Appendix G5**.
3	Archaeological and Cultural Heritage Impact Assessment	A Heritage Impact Assessment has therefore been undertaken and attached as **Appendix G6**.
4	Civil Aviation Theme	The proposed development will include 3 to 4 storey residential units similar to existing developments in the area and will note create an obstacle for civil aviation. The civil aviation theme is recorded as medium and therefore a Specialist Assessment is not required.
5	Defence Theme	The defence theme is of low sensitivity and no specific assessment report is required.
6	Terrestrial Biodiversity Impact Assessment	The site is located within a Critical Biodiversity Area (CBA) and must be investigated for possible impacts such as loss of flora and fauna species, habitats or species diversity. Flora and Terrestrial Fauna Specialist Assessments have been attached as **Appendix G2** and **G3** respectively.

Have specialist reports been attached	**YES √**	**NO**

If yes indicate the type of reports below

Geotechnical Assessment report, please refer to **Appendix G1**
Floral Impact Assessment report, please refer to **Appendix G2**
Terrestrial Fauna & Avifauna Biodiversity Impact Assessment report, please refer to **Appendix G3**
Avifaunal Impact Assessment report, please refer to **Appendix G4**
Water Resource Assessment report, please refer to **Appendix G5**
Heritage Impact Assessment report, please refer to **Appendix G6**
Socio-economic Assessment report, please refer to **Appendix G7**
Traffic Impact report, please refer to **Appendix G8**
Floodline Assessment Report refer to **Appendix G9**

The specialist assessments and reports are in terms of section 24(5)(h) of the NEMA and have been attached as ***Appendix G***.

9. SOCIO-ECONOMIC CONTEXT

Describe the existing social and economic characteristics of the area and the community condition as baseline information to assess the potential social, economic and community impacts.

The identified site is referred to as Bryanston Ext 3-B which is located along Spruce Street and Cork Avenue in Ward 104 of the City of Johannesburg Metropolitan Municipality (CoJ). The site lies within the boundaries of the Ferndale Valley Arboretum.

Demographics:

As an urban area Ward 104 displays much lower densities than the high population density of the CoJ. There is specifically a high concentration of economically active people in Ward 104, suggesting a lower dependency burden. Approximately 37% of the population in Ward 104 could be classified as Black African in 2011, much lower than the national, provincial or city averages. The language and country of birth profile of the Ward suggest a relatively high representation of foreigners in the area, most probably from countries outside Africa.

Within Ward 104, 87% of the households live in different types of formal dwellings, with 13% of the households falling within the "other" category. Only 1.2% of the households of Ward 104 live in informal shacks compared to 18.5% within the CoJ. The majority of households (58%) lived in houses as opposed to cluster/town houses or apartments.

Infrastructure:

Ward 104 and the larger area in which Bryanston Site B is located offers access to all major bus and taxi routes as well as easy access to highways and major routes. Roads within the area are generally in a fair to good condition although on-going maintenance is required to keep the road network up to standard and to repair potholes. There is no direct road from the main access roads to the site. Cork Avenue and/or Spruce Street are likely to function as the main access roads to the site. Some of the access roads will be upgraded to improve traffic flow in the area.

There are various primary and independent schools, as well as secondary schools within the area surrounding the site. Schools located within the vicinity of the study area are Bryanston Primary (6,6km; 12-20 minutes), Risidale Primary (8,8 km, 14-24 mins), Bryneven Primary (8-9km;16-28min), I.R Griffiths Primary (7km; 12-24 mins), Bordeaux Primary (5,3km; 9-16min), Delta Park Special learning needs school (8,2km;14-30min). All private medical facilities are 7 to 9km away from the site with travel time of 10-30minutes in morning peak traffic.

It should be noted that the proposed Bryanston Extension 3 Human Settlement land parcels are directly in the path of the starting section of the PWV3 freeway, which starts at Rocky Street and proceeds northwards via the Arboretum River valley to the N1 with a proposed N1/PWV3 systems interchange and extends north-westward to Zandspruit. The PWV3 is not reflected in the latest CoJ SDF Map but however because this freeway reserve has not been de-proclaimed as yet, comment must be obtained from Gautrans.

Service Delivery:

Provision of basic services to the community of Johannesburg is comparatively high. However, there continues to be a deficit, particularly in informal settlements. Basic service delivery in Ward 104 can be described as sufficient, although maintenance and upgrades of e.g. sewage and water networks are required. Residents of the Ward do experience some challenges as expressed in the public meeting held in February 2020.

10. CULTURAL/HISTORICAL FEATURES

Please be advised that if section 38 of the National Heritage Resources Act 25 of 1999 is applicable to your proposal or alternatives, then you are requested to furnish this Department with written comment from the South African Heritage Resource Agency (SAHRA) – Attach comment in appropriate annexure

38. (1) Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorised as-

(a) the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;

(b) the construction of a bridge or similar structure exceeding 50m in length;

(c) any development or other activity which will change the character of a site-

(i) exceeding 5 000 m^2 in extent; or

(ii) involving three or more existing erven or subdivisions thereof; or

(iii) involving three or more erven or divisions thereof which have been consolidated within the past five years; or

(iv) the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;

(d) the re-zoning of a site exceeding 10 000 m^2 in extent; or

(e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority, must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.

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

If YES, explain:

If uncertain, the Department may request that specialist input be provided to establish whether there is such a feature(s) present on or close to the site.

Briefly explain the findings of the specialist if one was already appointed:

The Heritage Impact Assessment determined that no sites, features, or objects of heritage significance occur in the study area. If heritage features are identified during construction, as stated in the management recommendation, these finds would have to be assessed by a specialist, after which a decision will be made regarding the application for relevant permits.

Ruins of a modern house were identified during the physical survey, but these are viewed as having very low significance due to the fact that they are very common to the larger region. The Palaeontological Sensitivity Map (SAHRIS) indicates that the study area has an insignificant to zero possibility of fossil remains being found and therefore no palaeontological assessment is required.

Will any building or structure older than 60 years be affected in any way?	YES	**NO √**
Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)?	YES	**NO √**

If yes, please attached the comments from SAHRA in the appropriate Appendix

SECTION C: PUBLIC PARTICIPATION (SECTION 41)

1. THE ENVIRONMENTAL ASSESSMENT PRACTITIONER MUST CONDUCT PUBLIC PARTICIPATION PROCESS IN ACCORDANCE WITH THE REQUIREMENT OF THE EIA REGULATIONS, 2014.

A summary of the Public Participation Process undertaken for the project to date is as follows:

- A Meeting to introduce the project was held with the Ward Councillor and Key Stakeholders on 27th of November 2019;
- An advertisement was placed on page 6 of the 31st January 2020 edition of the Randburg Sun. The advert was a notification of the intention of GDHS to apply for Environmental Authorisation for the proposed development and to undertake a Basic Assessment as per the EIA Regulations, 2014 as amended;
- Three (03) On-site notices presenting the proposed development were erected along the fence of the site along Cork Avenue on the 22nd of January 2020;
- A public meeting was held on the 12th of February 2020 at the New Covenant Church Building in Douglasdale;
- Notification Letters were distributed from November 2019 including the distribution of hardcopies of the Notification Letters in the vicinity of the site (Bryanston) on the 22nd of January 2020.

On the 5th of June 2020, the Minister issued directions regarding the measures to address, prevent and combat the spread of the COVID-19 relating to the National Environmental Management Permits and Licences. One of the requirements provided in the directions is that a Public Participation Plan (PP Plan) shall be submitted to and be approved by the competent authority. The purpose of the PP Plan was to provide the competent authority with direction on the public participation processes to be fulfilled while ensuring that the EAPs actions curtail the threat posed by the Covid-19 pandemic and to alleviate, contain and minimise the effects of the national state of disaster.

A Public Participation Plan (PP Plan) was submitted to Gauteng Department of Agriculture and Rural Development (GDARD) on the 15th of July 2020. Approval of the PP Plan was received on the 23rd of July 2020.

The following organs of state were identified as Commenting Authorities and will be provided with links or hard copies of the report:

- Gauteng Department of Agriculture and Rural Development;
- City of Johannesburg Metropolitan Municipality;
- Department of Water and Sanitation (Gauteng Regional Office);
- South African Heritage Resource Agency;
- Provincial Heritage Resources Authority Gauteng (PHRAG);
- Boschkop Municipal Nature Reserve;
- Rietfontein Ridge Municipal Nature Reserve; and

- Lone Hill Municipal Nature Reserve.

2. LOCAL AUTHORITY PARTICIPATION

Local authorities are key interested and affected parties in each application and no decision on any application will be made before the relevant local authority is provided with the opportunity to give input. The planning and the environmental sections of the local authority must be informed of the application at least thirty (30) calendar days before the submission of the application to the competent authority.

Was the draft report submitted to the local authority for comment?	**YES√**	NO
If yes, has any comments been received from the local authority?	YES	**NO√**

If "YES", briefly describe the comment below (also attach any correspondence to and from the local authority to this application):

If "NO" briefly explain why no comments have been received or why the report was not submitted if that is the case.

The Draft Basic Assessment Report will be issued to the Local Authority, soliciting their comments during the public review period from 7 July to 10 July 2021. The Draft Basic Assessment Report is currently under review by the City of Johannesburg (CoJ) Environment & Infrastructure Service Department (EISD), following distribution of the DBAR as per Regulation 43(2) of the EIA Regulations, 2014 as amended.

3. CONSULTATION WITH OTHER STAKEHOLDERS

Any stakeholder that has a direct interest in the activity, site or property, such as servitude holders and service providers, should be informed of the application at least **thirty (30) calendar days** before the submission of the application and be provided with the opportunity to comment.

Has any comment been received from stakeholders?	**YES √**	NO

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

Development/Activity Description

a) How will this development fit in to the surroundings i.e. will the type of low-cost development blend in with the other existing developments in the area. This is a must and the developments must be walled?
b) Are the units going to be sold or rented out? If they will be rented out, who will be responsible for their maintenance?
c) Will the Complex have a shopping facility?

Bulk Services

a) Has the City of Johannesburg been consulted with regards with upgrading and maintenance of the bulk services?
b) How will this development impact on current service infrastructure i.e. water, sewer and electricity i.e. the infrastructure is old and failing, adding more burden on these services will cause it to continuously fail.
c) I own multiple properties in the vicinity of the proposed site which are already impacted by congested roads, regular power outages, overflowing sewerage pipes and inadequate water pressure.

Roads and Stormwater

a) Will the street Storm Water reticulation be extended? If so, to what extent and at what cost?
b) Will the Attenuation pond be adequate to handle stormwater?
c) Stormwater drains, what will be done with these? as the ones in place are not adequate now. Will these be upgraded, or will they remain as they are?

Traffic

a) I would like information as to how the development will affect traffic.
b) What consideration has been given to the current peak hour traffic and an additional "350" cars?
c) Identify by name, the roads that will have pavements and at what cost?
d) What happened to the PWV3 route proclaimed in the 1980s and which was planned for the area now proposed for development?

Electricity

a) Will the existing Electrical Infrastructure cope with the additional Load?
b) Will the existing Sewage Infrastructure cope with the additional Load? How many m^3 available and what is the Project requirement? Or will an upgrade be required and at what cost?

Waste Management

a) Will the existing "Pick it Up" Infrastructure cope with the additional Load? Or will an upgrade be required?

Correspondence from interested and affected parties are attached as **Appendix E5**.

If "NO" briefly explain why no comments have been received

4. GENERAL PUBLIC PARTICIPATION REQUIREMENTS

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

The EAP must record all comments and respond to each comment of the public / interested and affected party before the application report is submitted. The comments and responses must be captured in a Comments and Responses Report as prescribed in the regulations and be attached to this application.

On the 1st of July 2021 all applicable sections of the Protection of Personal Information Act (POPI) become relevant to the public participation process of NEMA activities and all walks of life. The purpose of this Act is to:

- **give effect to the constitutional right to privacy, by safeguarding personal information when processed by a responsible party, subject to justifiable limitations; and**
- **regulate the manner in which personal information may be processed, by establishing conditions, in harmony with international standards, that prescribe the minimum threshold requirements for the lawful processing of personal information.**

For this reason all personal information (emails, contact numbers, address) have been blanked out and excluded from Public Participation section and will only be provided to GDARD officials who do not require consent to receive such information in the performance of their official duties. Contact details will be provided for all state officials who have jurisdiction on this application.

For all other interested and affected parties, personal information for material reasons will only be provided upon receipt of written consent from the affected party. These measures have been put in place to protect the personal information of all parties and safeguard their privacy in terms of the POPI Act.

The Comments and Responses Report (CRR) captures the comments and issues raised by Interested and Affected Parties (I&APs) and authorities during the initial notification phase. The necessity for the CRR is based on Regulation 44 of the National Environmental Management Act's (NEMA) Environmental Impact Assessment (EIA) Regulations of 2014 (as amended). A summary of the Public Participation Process undertaken for the project to date is provided in Appendix E6.

The majority of comments received were during the public meeting held on the 12th of February 2020 at the New Covenant Church Building in Douglasdale. However, several I&AP also sent written comments at various stages of the process.

5. APPENDICES FOR PUBLIC PARTICIPATION

All public participation information is to be attached in the appropriate Appendix. The information in this Appendix is to be ordered as detailed below
Appendix 1 – Proof of site notice
Appendix 2 – Written notices issued as required in terms of the regulations
Appendix 3 – Proof of newspaper advertisements
Appendix 4 –Communications to and from interested and affected parties
Appendix 5 – Minutes of any public and/or stakeholder meetings
Appendix 6 - Comments and Responses Report
Appendix 7 –Comments from I&APs on Basic Assessment (BA) Report
Appendix 8 –Comments from I&APs on amendments to the BA Report
Appendix 9 – Copy of the register of I&APs

All personal information (emails, contact numbers, physical/postal address) have been blanked out and excluded from Public Participation section and will only be provided to GDARD officials and other state officials who do not require consent to receive such information in the performance of their official duties. For all other Interested and affected parties, personal information for material reasons will only be provided upon receipt of written consent from the affected party. These measures have been put in place to protect the personal information of all parties and safeguard their interests in terms of the POPI Act.

SECTION D: RESOURCE USE AND PROCESS DETAILS

Note: Section D is to be completed for the proposal and alternative(s) (if necessary)

Instructions for completion of Section D for alternatives

1) For each alternative under investigation, where such alternatives will have different resource and process details (e.g. technology alternative), the entire Section D needs to be completed
4) Each alterative needs to be clearly indicated in the box below
5) Attach the above documents in a chronological order

Section D has been duplicated for alternatives	**0**	times	(complete only when appropriate)

Section D Alternative No.		(complete only when appropriate for above)

1. WASTE, EFFLUENT, AND EMISSION MANAGEMENT

Solid waste management

Will the activity produce solid construction waste during the construction/initiation phase?	**YES √**	NO
If yes, what estimated quantity will be produced per month?	22m²	

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

During the construction phase the solid waste that will be generated. This waste will be temporarily stored on site in designated waste skips or stockpiles and removed by an appropriate service provider appointed by the principal contractor to a nearby licensed disposal facility. The nearest disposal landfill is the Linbro Park landfill located about 16km east of the site.

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

Solid waste (general) removed from site will be disposed of at Linbro landfill site.

Will the activity produce solid waste during its operational phase?	**YES √**	NO
If yes, what estimated quantity will be produced per month?	46 m²	

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

The waste will be collected from site on a regular basis and disposed of registered landfill site. The nearest landfill site is the Linbro landfill site.

Has the municipality or relevant service provider confirmed that sufficient air space exists for treating/disposing of the solid waste to be generated by this activity?	YES	**NO √**

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

- During the construction phase the appointed Contractor will be responsible for identification the nearest registered landfill site and precuring the waste removal services.
- During the operational phase, all waste will be collected by the CoJ refuse unit and fed into a municipal waste stream. The development will include recycling waste bins to ensure recyclable waste is sorted at source.

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

Can any part of the solid waste be classified as hazardous in terms of the relevant legislation?	YES	NO √

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

Is the activity that is being applied for a solid waste handling or treatment facility?	YES	NO √

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

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

It is recommended that where practical, recyclable waste should be collected in separate waste bins. In addition, any waste materials that can be re-used on site for other purposes must be used as much as possible to minimize the waste that will need to be disposed of at the disposal facilities.

Liquid effluent (other than domestic sewage)

Will the activity produce effluent, other than normal sewage, that will be disposed of in a municipal sewage system?	YES	NO √
If yes, what estimated quantity will be produced per month?		
If yes, has the municipality confirmed that sufficient capacity exist for treating / disposing of the liquid effluent to be generated by this activity(ies)?	YES	NO √

Will the activity produce any effluent that will be treated and/or disposed of on site?	YES	NO √
If yes, what estimated quantity will be produced per month?		**m^3**

All effluents from the chemical toilets that will be generated during the construction phase will be removed by a registered waste service provider for disposal at the Northern Wastewater Treatment Works

If yes describe the nature of the effluent and how it will be disposed.

Note that if effluent is to be treated or disposed on site the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA

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

If yes, provide the particulars of the facility:

Facility name:

Contact person:			
Postal address:			
Postal code:			
Telephone:		Cell:	
E-mail:		Fax:	

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

Grey water from construction camp ablution areas will not be recycled for potable use but will be collected in a dedicated collection tank and used for dust control.

Liquid effluent (domestic sewage)

Will the activity produce domestic effluent that will be disposed of in a municipal sewage system?	**YES √**	NO
If yes, what estimated quantity will be produced per month?	3312 m3	
If yes, has the municipality confirmed that sufficient capacity exist for treating / disposing of the domestic effluent to be generated by this activity(ies)?	**YES√**	NO

Will the activity produce any effluent that will be treated and/or disposed of on site?	YES	**NO √**

If yes describe how it will be treated and disposed off.

Emissions into the atmosphere

Will the activity release emissions into the atmosphere?	**YES √**	NO
If yes, is it controlled by any legislation of any sphere of government?	YES	**NO √**

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

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

Emissions from the proposed development will include dust from vehicles using the gravel access road; this will however be minimal as the proposed development will not result in a significant increase of traffic. Dust will also be as a result of preparing the land and/or due to construction including the exhaust gases from construction vehicles working on site during the construction phase. Dust from associated construction activities will be generated.

- Carbon monoxide from construction vehicle emissions
- Dust from excavation and other construction activities

The concentration of each emission will be low and managed by mitigation measures as prescribed by the EMPr (**Appendix H**)

2. WATER USE

Indicate the source(s) of water that will be used for the activity

municipal	Directly from water board	groundwater	river, stream, dam or lake	other	the activity will not use water

If water is to be extracted from groundwater, river, stream, dam, lake or any other natural feature, please indicate
the volume that will be extracted per month:

If Yes, please attach proof of assurance of water supply, e.g. yield of borehole, in the appropriate Appendix

Does the activity require a water use permit from the Department of Water Affairs?	YES√	NO

If yes, list the permits required

A water Use License is required in terms of Section 21 (c) and (i) water uses. The development will occur within 500 meters of the Bryanston River and wetland. This area is regulated by the Department of Water and Sanitation and a Water Use Authorisation is required.

A risk assessment was undertaken in terms of Section 21 (c) and (i) of the National Water Act, 1998, (Act 36 of 1998) to investigate the level of risk posed by proposed project. The risks posed by the proposed development to the Bryanston River and its Riparian zones. Overall, all anticipated risks associated with rehabilitation are considered to have a Low impact significance and therefore Water Uses must be registered through a General Authorisation. An application has been submitted to the relevant department.

If yes, have you applied for the water use permit(s)?	YES√	NO
If yes, have you received approval(s)? (attached in appropriate appendix)	YES	NO √

3. POWER SUPPLY

Please indicate the source of power supply e.g. Municipality / Eskom / Renewable energy source

Municipality

If power supply is not available, where will power be sourced from?

Generators or any other sustainable energy sources

4. ENERGY EFFICIENCY

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

The largest saving in energy requirement lies in making best possible use of construction labour for tasks that do not specifically require electrical machinery. This will have the added advantage of reducing noise and air pollution generated on site. Solar panel roofs will be considered for the development to reduce electricity requirements for geysers.

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

The development design is inclusive of renewable technology such as solar energy and rainwater harvesting to not only reduce pressure on the over-burdened and ageing municipal network in the local area, but also to reduce the impact on the environment. Low consumption solar or gas-powered equipment will be favoured for cooking and lighting.

SECTION E: IMPACT ASSESSMENT

The assessment of impacts must adhere to the minimum requirements in the EIA Regulations, 2014, and should take applicable official guidelines into account. The issues raised by interested and affected parties should also be addressed in the assessment of impacts as well as the impacts of not implementing the activity (Section 24(4)(b)(i).

1. ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

Summarise the issues raised by interested and affected parties.

The comments captured in this report were obtained during the Notification Phase and public meeting undertaken prior to the submission of the application. These comments are summarised under the following themes:

- Detailed project description
- Support Engineering services (access road, bulk water, electricity, sewer infrastructure; traffic, stormwater drainage)
- Impacts on surrounding services and land uses
- Protection and conservation of natural resources (green belt, ridge and the arboretum)
- Project administration and management to manage impacts on community
- Safety and security; and
- General Matters.

The detailed correspondence, EAP response and minutes of the meeting are attached in **APPENDICES E6 and E7.**

Summary of response from the practitioner to the issues raised by the interested and affected parties (including the manner in which the public comments are incorporated or why they were not included) (A full response must be provided in the Comments and Response Report that must be attached to this report):

AFFECTED PARTIES:

1. **Project Description**

Regarding the characteristics of the proposed development, a large number of the residents required clarification on typology of the proposed development; RLRLP site selection and beneficiary processes and measures which will be implemented to ensure sustainability of the development.

2. **Support Engineering services**

With regards to engineering services, questions around these were mainly about whether the bulk stormwater, sewer, electrical, water and roads/traffic services would be available and sufficient to support the development, considering the existing problems in the area. The comments and questions required clarification on what upgrades will accompany the development.

3. Impacts on surrounding services and land uses

The impacts of the proposed development on surrounding services and land uses were also presented to the EAP. The residents and various Homeowners Association's raised concerns on the lack of schools and health facilities. They indicated that there are no government-owned schools and health facilities within the area and the private schools and health facilities were already strained, which would have huge implications for prospective beneficiaries who will reside in the proposed development.

4. Impacts on local biodiversity

With regard to the protection of natural resources, questions were mainly about why and how the development can be proposed within a greenbelt. The issues and concerns raised were that this area should be protected, and the development be proposed on a different site. Furthermore, measures which would be enforced to ensure that the biodiversity is protected were also queried.

5. Project administration and management of consultation with the community

Based on the comments received thus far, there were numerous objections to the development, based on existing issues on services, infrastructure, traffic, safety and security as well as objections based on the development being proposed in a conservation/greenbelt area that is environmentally sensitive. It is anticipated that additional comments on the above-mentioned as well as other issues will be obtained subsequent to the issuing of the Draft Basic Assessment Report for review.

2. IMPACTS THAT MAY RESULT FROM THE CONSTRUCTION AND OPERATIONAL PHASE

Briefly describe the methodology utilised in the rating of significance of impacts

1.1. Project Phases

PHASES OF THE PROJECT IN WHICH IMPACTS WILL OCCUR
• **Status Quo** The study area as it currently exists.
• **Pre-construction phase (pre-closure and rehabilitation phase)** All activities on site up to the start of construction, not including the transport of materials, but including the initial site preparations. This also includes the impacts that would be associated with planning.
• **Construction phase (closure and rehabilitation phase)** All the construction and construction-related activities on site, until the contractor leaves the site.
• **Operational phase (post-closure and rehabilitation phase)** All activities after construction, including the operation and maintenance of the

proposed housing development.

The activities arising from each of the relevant phases have been included in the impact assessment tables. The assessment endeavours to identify activities that would require environmental management actions to mitigate the impacts arising from them.
The criteria against which the activities were assessed are given in the next section.

The impacts anticipated to occur as a result of the proposed development are evaluated to determine their significance. The following evaluation criteria were used:

1.2. Assessment Criteria

The assessment of the impacts has been conducted according to a synthesis of criteria required by the guideline documents to the EIA regulations. In addition, it is a requirement of the National Environmental Management Act (NEMA) 2014 Regulations, Appendices 1 and 2 that an Impact and Risk Assessment process be undertaken for Basic Assessments.

The Assessment Criteria is based on the following concepts:

- Nature of impact;
- Extent (E);
- Duration (D);
- Intensity (I);
- Consequence (C); this will be a combination of Extent (E)+Duration (D) + Intensity (I)
- Probability (P);
- Determination of significance (with or without mitigation); and is a product of consequence (C) x Probability (P);
- Reversibility of impact; and
- Irreplaceable loss of resources will be defined as loss of resource for the purposes of the Impact Assessment Tables.

Each of these are explained in the Table below.

ASSESSMENT CRITERIA

ASSESSMENT CRITERIA	SCORING
a) Nature of Impact	
This is an appraisal of the type of effect the proposed activity would have on the affected environmental component. The description should include what is being affected, how and whether the impact is positive or negative.	Scoring does not apply, impact will either be positive or negative

b) Extent (E)	
The physical and spatial size of the impact. This is classified as: **i) Site** The impact could affect the whole, or a measurable portion of the site. **ii) Local** The impacted area extends only as far as the activity, e.g. a footprint of the specific activity. **iii) Regional** The impact could affect areas such as neighbouring erven, transport corridors and the adjoining towns. **iv) National** The impact could have an effect on South Africa.	**1** **2** **3** **4**
c) Duration (D)	
The lifetime of the impact; this is measured in the context of the lifetime of the proposed project. **i) Short term** The impact will either disappear with mitigation or will be mitigated through natural processes (less than 1 year). **ii) Medium term** The impact will last up to the end of the phases, thereafter it will be entirely negated (1 to 10 years). **iii) Long term** The impact will continue or last for the entire operational life of the development but will be mitigated by direct human action or by natural processes thereafter. **iv) Permanent** Mitigation either by man or natural processes will not occur in such a way or in such a time span that the impact can be considered transient, thus beyond decommissioning.	**1** **2** **3** **4**
d) Intensity (I)	
Is the impact destructive or benign? Does it destroy the impacted environment, alter its functioning, or slightly alter it? These are rated as:	

i) Low The impact alters the affected environment in such a way that the natural processes or functions are not affected.	**1**
ii) Medium (Moderate) The affected environment is altered, but function and process continue, albeit in a modified way.	**2**
iii) High Function or process of the affected environment is disturbed to the extent where it temporarily or permanently ceases. This will be a relative evaluation within the context of all the activities and the other impacts within the framework of the project.	**3**
e) Consequence of Impact (C)	
The anticipated consequence of the impact is determined using the following formula: **Consequence = Duration + Extent + Intensity** Consequence is rated as: **i) Negligible** An acceptable impact on natural systems, patterns or processes.	**3**
ii) Low A small impact on natural systems, patterns or processes, where the environment continues to function but in a modified manner and for which mitigation is desirable but not essential.	**4-5**
iii) Moderate A substantial alteration of natural systems, patterns or processes, where environmental functions and processes are altered such that they temporarily or permanently cease. Mitigation will be required.	**6-8**
iv) High A serious alteration of natural systems, patterns or processes. Impacts may result in the irreversible damage to irreplaceable aspects if mitigation measures are not implemented.	**9-10**
v) Very High Very high impact on natural systems, patterns or processes, where environmental functions and	**11-12**

processes are altered such that could permanently cease, even with mitigation.

f) Probability (P)

This describes the likelihood of the impacts actually occurring. The impact may occur for any length of time during the life cycle of the activity, and not at any given time. The classes are rated as follows:

i) Improbable — **1**

The possibility of the impact occurring is very low, due either to the circumstances, design or experience.

ii) Probable — **2**

There is a possibility that the impact will occur to the extent that provisions must be made.

iii) Highly probable — **3**

It is most likely that the impacts will occur at some or other stage of the development. Plans must be drawn up before the undertaking of the activity.

iv) Definite — **4**

The impact will take place regardless of any prevention plans, and mitigation actions or contingency plans are relied on to contain the effect.

h) Significance of impact with or without mitigation

Score		Significance = Consequence x Probability					
Probability	4	Definite	4	8	12	16	20
	3	Highly probable	3	6	9	12	15
	2	Probable	2	4	6	8	10
	1	Improbable	1	2	3	4	5
			Negligible	Low	Moderate	High	Very High

			1	2	3	4	5
		Consequence					

Significance is determined through a synthesis of impact characteristics. Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. To determine significance of the potential impact/risk, the consequence is multiplied by probability. The classes are rated as follows:	
i) No significance	1-3
The impact is not substantial and does not require any mitigation. Score 1-5	
ii) Low	4-6
The impact is of little importance but may require limited mitigation. Score 4-6	
iii) Medium (Moderate)	8-10
The impact is of importance and therefore considered to have a negative impact. Mitigation is required to reduce the negative impacts to acceptable levels. Score 8-10	12-16
iv) High	
The impact is of great importance. Failure to mitigate, with the objective of reducing the impact to acceptable levels, could render the entire development option or entire project proposal unacceptable. Score 12-16	20
v) Fatal Flaw	
The impact presents a fatal flaw and the entire development option or entire project proposal is unacceptable. Score 20	
g) Reversibility of impact (R)	
The extent to which the impacts are reversible **(i) Yes** The impact is reversible within two years after construction. **(ii) No** The impact is reversible within 2 to 10 years after construction.	
g) The degree to which the impact can cause irreplaceable loss of resources	
(i) Low	

The impact results in the loss of resources but the natural, cultural and social processes/functions are not affected. **(ii) Medium** The loss of resources occurs but natural cultural and social processes continue, albeit in a modified manner. **(iii) High** The impact results in irreplaceable loss of resource.	

In order to maintain consistency, all potential impacts that have been identified during the BA process will be listed in impact assessment tables. The assessment criteria used in the tables will be applied to all of the impacts and a brief descriptive review of the impacts and their significance provided in the text of the report. The overall significance of impacts will be determined by multiplying the score for consequence and the assigned probability of occurrence.

Briefly describe and compare the potential impacts (as appropriate), significance rating of impacts, proposed mitigation and significance rating of impacts after mitigation that are likely to occur as a result of the construction phase for the various alternatives of the proposed development. This must include an assessment of the significance of all impacts.

NB: For the purposes of this assessment and clarification, the proposed alternative layouts provided (Proposal, Alternatives 1 & 2) for the Bryanston 3B housing were assessed collectively as these are in a similar sensitive environment. Although these layouts differ with regard to the number of units and the layouts of the housing blocks, the impacts of these Layout Alternatives do not differ significantly from one another. The impacts for the two layout alternatives are therefore assessed together as detailed below. All these layouts will transect the existing sensitive environment including the Rocky grassland, bouldered rocky outcrop, woodlands, and the Modified grassland. Impacts from these layouts are likely to be similar. The only layout alternative that differs is Alternative 3 with respect to the impacts on the Rocky outcrop. The difference lies in the fact that Layout Alternative 3 proposes to preserve the rocky outcrop, which is one of the sensitive areas. All the other layouts propose the construction of the houses and associated infrastructure on the sensitive Rocky outcrop area, rocky grasslands, and woodlands. Alternative 3 also encroaches into the buffer zone of the wetland.

The impacts for the two layout alternatives are therefore assessed separately as detailed below.

Proposed and Preferred, Alternative 1 and 2 Layouts				
Potential impacts:	**Significance rating of impacts (positive or negative):**	**Proposed mitigation:** (***Please also refer to the draft EMPr, Specialist Assessment Reports for other mitigation measures***)	**Significance rating of impacts after mitigation:**	**Risk of the impact and mitigation not being implemented**
CONSTRUCTION PHASE IMPACTS				
1. Loss of floral habitat				
Loss of floral habitat may result from various activities (clearance of vegetation, destruction of habitat, soil disturbance, alien invasive, dust generation, other anthropogenic activities) during the construction and operational phases of the project	**E2+D2+I3=C7** **C7 X P2=S14** **High Negative**	• The location and extent of areas of increased ecological importance and sensitivity (such as the rocky grassland areas) should be considered during the pre-construction and planning phases. It is recommended that the high ecological sensitivity rocky grassland vegetation unit be excluded from the development footprint. As far as possible, conservation of the bouldered rocky outcrop and woodland vegetation units should also be considered. The extent of the watercourse and associated buffer zone (to be recommended by the wetland specialist/ freshwater ecologist) should also be taken into account when developing the project layout. • In planning the project, habitat connectivity between the residential units in the form of green spaces and the surrounding natural areas should be considered. • The amount of vegetation cleared for construction purposes should be limited to only what is required. • Site camps and other temporary infrastructure are to be placed within areas that are already disturbed or transformed. • Access to the development area should be from the main road to the north	**E1+D3+I2=C6** **C6 X P2=S10** **Medium**	Permanent loss of habitat
2. Loss of floral species diversity.				
Loss of floral species diversity may result from various activities (Clearing of vegetation in	**E2+D2+I3=C**			Degradation of surrounding areas and soil instability issues

sensitive areas, Movement of construction and operational vehicles, alien invasives, soil disturbances) during the construction and operational phases of the project	**7** **C7 X P2=S14** **High Negative**	or east of the study area and not through open space areas. No open space areas beyond the approved development footprint area, including the Bryanston River and associated buffer zones may be accessed by construction personnel or construction vehicles and should be treated as a No-Go zone. • All sensitive areas, including high sensitivity vegetation units outside of the development footprint should be clearly indicated on site and be off limits for construction vehicles and workers. • Construction vehicles should be restricted to travelling only on designated roadways, to limit the ecological footprint of the proposed development activities, and no new roads through natural vegetation may be constructed. • Edge effects from construction activities, such as erosion and alien floral species proliferation and spread, should be managed throughout the development, to prevent impacts on the open space area, especially further proliferation of alien species. • No littering or dumping of waste and construction material within natural areas to be excluded from the development footprint areas may be allowed. All excess material must be removed from the construction areas once works has been completed. • Alien plant proliferation within disturbed areas should be controlled through the implementation of an ongoing monitoring and eradication programme for all invasive and weed plant species occurring within the study area, with specific emphasis on the eradication of NEMBA Category 1b invasive species. • Eradication of *Campuloclinium macrocephalum* should take place within the open space area regardless of whether the project proceeds or not. • Any disturbed and compacted areas outside of the immediate development footprint areas must be ripped, reprofiled and revegetated with an indigenous grass species mixture upon completion of construction works. • As part of the landscaping for the residential units, if considered, it is strongly recommended that an indigenous species approach be implemented, which will also impact positively on management, water use and sustainability of any landscaped areas. Such an approach will also improve habitat provision for indigenous faunal species. • The use of indigenous *Cynodon dactylon* lawn, if considered, is ecommended instead of *Pennisetum clandestinum* (Kikuyu) or *Dactyloctenium australe* (LM) lawn. Mowed veldgrass instead of monospecific lawn may also be considered.	**E1+D3+I2=C6** **C6 X P2=S10** **Medium**	
3. Loss of floral SCC				
		• Areas such as the Rocky Grassland vegetation unit, where known floral SCC in		Permanent loss of Floral

Loss of potential floral Species of Conservation Concern (SCC) may result from various activities (Clearing of vegetation in sensitive areas,removal of medicanal/proected species, Movement of construction and operational vehicles, alien invasives, soil disturbances) during the construction and operational phases of the project	**E1+D3+I2=C6** **C6 X P2=S10** **Medium Negative**	the form of provincially protected floral species occur and where habitat is available for further potential floral SCC to occur, should be excluded from the proposed development footprint. • Floral SCC present within the study should ideally be conserved *in situ.* • During the planning and surveying phase of surface infrastructure, any floral SCC that may be potentially affected by surface infrastructure (such as *Hypoxis hemerocallidea*) must be marked and where possible, relocated to suitable, similar open space habitat in the surrounding area. Relevant permits must be applied for from local authorities, depending on the status of the species, prior to the construction phase. • Should any floral SCC not encountered during the field assessment be noted within the study area, these species should be relocated to similar habitat within or in the vicinity of the study area with the assistance of a suitably qualified specialist, after the authorities have been notified. • No collection of floral SCC or medicinal floral species may be allowed by construction personal or future residents of the proposed housing units. • Edge effect management needs to be implemented to ensure no further degradation and potential loss of floral SCC outside of the proposed project footprint area.	**E1+D1+I2=C4** **C4 X P1=S4** **Low**	species
4. Destruction of fauna habitat and loss of habitat heterogeneity				
Development of the site will result in loss of habitat heterogeneity, reduce the interconnectivity between the different habitat types, reduce the width of the ecological corridor, and significantly reduce the function of the ecological node	**E2+D2+I3=C7** **C7 X P2=S14** **High Negative**	• **STOP**: No activities are to commence within the wetlands and buffers (100m buffer) until the necessary authorisations are obtained under the National Water Act (NWA) and NEMA. • No activities should take place in areas designated as highly sensitive (NO-GO AREAS) as per Plan 5. • **MODIFY**: Areas designated as low sensitivity must be targeted for physical development. • Areas of moderate sensitivity within the development area should be targeted for indigenous green space or green drainage lines. The ecological connectivity between moderately sensitive areas targeted for inclusion into development areas and highly sensitive areas must be maintained through palisade fencing or tunnels in walls that will allow for at least a cat-sized animals to move through. • Plan and implement a proper engineered storm-water management plan from the onset to prevent excessive runoff and associated erosion and sedimentation in downstream habitats. • **CONTROL**: Peg out and demarcate areas for development and no-go areas before commencing with any activities. No activity, whatsoever, should occur in no-go areas.	**E1+D1+I2=C4** **C4 X P1=S4** **Low**	Permanent loss of faunal habitat

		• Maintain areas of physical disturbance as small as possible to limit the area of disturbance. • Plan for material stockpiles (topsoil and subsoil and excavated rock) within the areas designated as low sensitivity. Utilise the soil in private gardens or for landscaping and berms or level out over areas of low sensitivity. Do not leave the mounds in place after construction. • Conduct soil stripping and stockpiling during the dry season or ensure adequate erosion control and sediment traps are in place to prevent down-slope impacts. • Ensure policies are in place to prevent body corporates / residents from planting AI species or hardscaping areas within moderately sensitive areas. • **REMEDY**: Where areas not targeted for development are inadvertently i		
5. Disturbance to fauna through noise, vibration, dust and emigration of fauna from site				
The site neighbours developed areas (roads and residential areas) on its western and northern boundary *and the site experiences some of these impacts on a daily basis.*	**E1+D2+I1=C4** **C4 X P2=S8** **Medium Negative**	• **STOP**: No activities are to take place in areas designated as highly sensitive as per Plan 5. • **MODIFY**: Commence with primary excavation and earth-moving activities during the dry season as far as possible when bird populations are likely to be lower (most migrant species will be absent and birds are unlikely to have chicks or fledglings). This will also benefit other seasonally breeding fauna. • Utilise quieter equipment where feasible. • Any fencing erected in areas of moderate sensitivity must provide for animal migration (see mitigations for Impact 1] to allow fauna to escape development areas. • Establish indigenous gardens and consider establishing bird and bat boxes in and around residential areas to attract local species to the site. • **CONTROL**: Ensure dust suppression, through water sprinkling, is applied at time of high dust generation. • Noisy point-sources should be enclosed and equipment / machinery fitted with silencers. All equipment / machinery will be serviced and maintained within operating specifications to prevent excessive noise. • Ensure policies are in place to ensure residents do not generate excessive noise on site and maintain urban noise level limits. •	**E1+D1+I2=C4** **C4 X P1=S4** **Low**	Disturbance of fauna and loss
Displacement impact to Avifauna as a result of habitat loss or transformation				
Displacement of Red List species as a result of habitat loss or transformation - Avifaunal habitat is cleared *to accommodate the proposed Bryanston Ext. 3B Housing*	**E2+D2+I3=C7** **C7 X P2=S14**	• Cannot be mitigated fully. Loss of habitat is inevitable with the construction of the residential development. • Construction activity is restricted to the immediate footprint of the infrastructure. • The recommendations of the ecological specialist studies must be strictly implemented, especially as far as limitation of the construction footprint and	**E1+D2+I1=C4** **C4 X P2=S8** **Medium**	Irreplaceable loss of avifauna species

development, reducing the amount of habitat available to birds for foraging, roosting and breeding	**High Negative**	rehabilitation of disturbed areas are concerned.	**Negative**	
Displacement impact to Avifauna as a result of disturbance				
Displacement of Red List species as a result of disturbance associated with the construction of the Bryanston Ext 3B Housing development (i.e. noise and movement of construction and operational equipment and personnel) resulting in a negative direct impact on the resident avifauna.	**E2+D3+I3=C8** **C8 X P2=S16** **High Negative**	• Cannot be mitigated. Disturbance is inevitable with the construction of the Bryanston Ext. 3B Housing development at this location.	**E2+D3+I3=C8** **C8 X P2=S16** **High Negative**	Irreplaceable loss of avifauna species
Direct mortality to Avifauna as a result of construction activities				
Direct mortality of Red List species, particularly ground nesting bird, as a result of construction activities associated with the Bryanston Ext 3B Housing development resulting in a negative direct impact on the resident avifauna.	**E1+D1+I2=C4** **C4 X P1=S4** **Low**	• Conduct an avifaunal inspection prior to the construction phase of this project. • Should nests or breeding locations, pertaining to Red List and other more common species, be identified during the inspection, mitigation must be implemented to ensure that this impact is reduced to negligible levels.	**E1+D1+I1=C3** **C3 X P1=S3** **Low**	
6. Attraction of pests and exotic / alien species				
Several urbanised exotic and alien invasive species are already present in the area. Activities, such as leaving food and food waste out, could attract additional species or individuals to site which must be avoided.	**E1+D2+I1=C4** **C4 X P2=S8** **Medium Negative**	• **MODIFY**: Maintaining and improving local indigenous populations could assist in reducing alien species numbers on site through competition. Therefore maintain indigenous gardens on site. Consider • establishing bird/bat boxes to attract local species back to the site. • **CONTROL**: Compile and implement an alien invasive management plan in line with the municipal management plan, which must include measures to prevent attracting additional alien avifauna and mammals to site. This should include not feeding wild life and ensuring that all food and food waste, • including domestic waste, is placed in sealed containers and not exposed on site. Ensure that the outside areas are kept clean and tidy and provide adequate waste removal services to prevent the attraction of rats and other alien scavenging species to the site. • Ensure policies are in place to prevent residents from planting AI species.	**E1+D1+I2=C4** **C4 X P1=S4** **Low**	Increase in scavenging

		• **REMEDY**: Clear all domestic and food waste from site on a daily basis		
7. Hindrance, trapping, killing of fauna				
Most fauna will escape the construction site, but removal of all burrowing species will be impossible, and some fauna species will be lost through excavation activities. Any fauna trapped on site should be removed as far as possible to prevent loss of fauna. This is applicable to all groups of fauna, from invertebrates to mammals.	**E1+D2+I1=C4** **C4 X P2=S8** **Medium Negative**	• **STOP**: No poisons against fauna are to be brought on site; where this is not possible any substance that could be toxic to fauna will be stored and handled in a manner that will prevent exposure of the substance to the environment. • No deliberate killing or trapping of indigenous fauna is allowed on site, unless trapping is done by a specialist to remove the specimen from the area. Any requirements of the Gauteng Nature Conservation • Ordinance must be complied with regarding handling of such species. • **MODIFY:** Limit overhead lines to only areas of low sensitivity; any overhead lines over moderately or highly sensitive areas will be fitted with bird deterrents. • **CONTROL**: Environmental awareness training must include the prohibition of any harm or hindrance to any indigenous fauna species and the consequences of such actions. Staff should also be provided a list of potential TOP species on site to specifically ensure these species are protected. • Policies must be in place to ensure residents do not kill indigenous fauna. • Policies with residents should include control of potentially toxic substances to fauna which will be stored and handled in a manner that prevents exposure of the toxin to the environment. • **REMEDY**: Contracts with contractors must specify actions that will be taken against contractors who do not conduct activities in line with the EMP. • Ensure safe speed limits and working conditions on the site. •	**E1+D1+I2=C4** **C4 X P1=S4** **Low**	Disturbance and loss of faunal species
8. Contamination of fauna environment through use and storage of hazardous substances, littering and dumping of waste or sewage leaks				
The proximity of the tributary to the site means that any contaminants spilled on site will enter the tributary fairly quickly during a rainfall event and disperse contaminants to downstream environments. Therefore all contaminating substances, including waste and sewage, must be handled properly on site	**E1+D2+I1=C4** **C4 X P2=S8** **Medium Negative**	• **STOP**: Discontinue use of all faulty machinery / equipment on site until properly repaired. Ensure a waste management plan has been compiled in line with the National Environmental Management: Waste Act (NEM:WA) highlighting handling and storage of various wastes on site, in line with prescribed standards before any activities commence on site. • All toxic and hazardous substances will have adequate storage facilities available on site, in line with relevant prescribed requirements, before being brought to site. • **MODIFY**: Due to proximity of petrol stations, hydrocarbon storage on site during construction should be limited to daily needs only. • Repairs to vehicles will be conducted off-site and where this is not possible the underlying ground will be covered with impermeable sheet and pans. • Plan and implement a proper storm-water management plan from the onset, which must incorporate a hydrocarbon collection system for the workshop	**E1+D1+I2=C4** **C4 X P1=S4** **Low**	Large spills or leaks will contaminate the environment and poison the fauna

		and parking area. • Provide for adequate portable toilets for the number of staff on site. • **CONTROL**: All equipment / machinery will be serviced and maintained within operating specifications to prevent the risks of leak. • Hydrocarbons (new and used) must be properly stored and handled according to prescribed manner and must in no way be exposed to the environmental elements. • Any cars, machinery or equipment parked on site will either be parked on a concrete slab or have pans placed under them to collect all drips and potential leaks. • Keep portable toilets clean and hygienic. Portable toilets will properly managed and emptied regularly to prevent overflow and leaks. • All waste (domestic, hydrocarbon, hazardous) must be managed in line with the prescribed waste management plan. • Refuse bins with properly secured lids will be placed around site to collect waste for separation, recycling and disposal. Waste (domestic, construction, hazardous) should be recycled as far as possible and sold/given to interested contractors. Recyclable waste should not be stored for excessive periods		
9. Contamination of fauna environment through use and storage of hazardous substances, littering and dumping of waste or sewage leak				
Waste will be stored according to the Norms and Standards for Storage of Waste.	**E1+D2+I2=C5** **C5 X P2=S10** **Medium Negative**	• All hydrocarbons spills on bare ground will be cleared immediately. This will include the lifting of the contaminated soil for bio-remediation or disposal to a hazardous waste facility. • Inspect and clear all litter and waste from the site and surrounds. • Toilets and general plumbing will be regularly checked for leaks which will be attended to immediately. • Repair and clean any sewage leaks immediately.	**E1+D1+I2=C4** **C4 X P1=S4** **Low**	Disturbance of faunal species
10. Displacement of Red List species as a result of habitat loss or transformation -				
Avifaunal habitat is cleared to accommodate the proposed Bryanston Ext. 3B Housing	**E2+D2+I3=C7**	• Cannot be mitigated fully. Loss of habitat is inevitable with the construction of the residential development. • Construction activity is restricted to the immediate footprint of the	**E1+D2+I1=C4** **C4 X P2=S8**	Loss of faunal species

development, reducing the amount of habitat available to birds for foraging, roosting and breeding	**C7 X P2=S14** **High Negative**	infrastructure. • The recommendations of the ecological specialist studies must be strictly implemented, especially as far as limitation of the construction footprint and rehabilitation of disturbed areas are concerned.	**Medium**	
11. Displacement of Avifaunal species as a result of disturbance				
Displacement of Red List species as a result of disturbance associated with the construction of the Bryanston Ext 3B Housing development (i.e. noise and movement of construction and operational equipment and personnel) resulting in a negative direct impact on the resident avifauna	**E2+D2+I3=C 7** **C7 X P2=S14** **High Negative**	• Cannot be mitigated fully. Disturbance is inevitable with the construction of the Bryanston Ext. 3B Housing development are likely to have dire consequences for African Finfoot	**E1+D2+I1=C4** **C4 X P2=S8** **Medium**	Loss of avifaunal species
12. Mortality of Red List species				
Direct mortality of Red List species, particularly ground nesting bird, as a result of construction activities associated with the Bryanston Ext 3B Housing development resulting in a negative direct impact on the resident avifauna	**E1+D2+I1=C 4** **C4 X P2=S8** **Medium Negative**	• Conduct an avifaunal inspection prior to the construction phase of this project. • Should nests or breeding locations, pertaining to Red List and other more common species, be identified during the inspection, mitigation must be implemented to ensure that this impact is reduced to negligible levels	**E1+D1+I2=C4** **C4 X P1=S4** **Low**	Loss of faunal species
13. Impact on surrounding water resources				
Increase in sediment inputs & turbidity	**E1+D2+I1=C 4** **C4 X P2=S8** **Medium Negative**	• Sediment traps must be installed together with erosion monitoring in and around the project area. The proposed development must be undertaken preferably during the dry season.	**E1+D1+I2=C4** **C4 X P1=S4** **Low**	Contamination and degradation of water resources
Alterations of flow volumes and patterns of flows (increased flood	**E1+D1+I2=C**	• An attenuation pond must be constructed between the recommended buffer zone and the proposed development to attenuate stormwater and to	**E1+D1+I2=C4**	

peaks	**4** **C4 X P1=S4** **Low**	assimilate toxicants. • A bioretention component must be incorporated into this pond to assist with assimilation of contaminants. Water from this attenuation pond must be diffusely redistributed into the river system to the east; and • • It is recommended that the buffer zone of 30 m be adhered to. • • all watercourses be demarcated as sensitive areas, and no construction activity, laydown yards, camps or dumping of construction material are to be permitted within the sensitive zones (where possible)	**C4 X P1=S4** **Low**	
Increased in nutrient inputs and toxic organic contaminants and Alteration of acidity (pH) *Inputs of toxic heavy metal contaminants*	**E1+D1+I2=C4** **C4 X P1=S4** **Low**	• Off-site equipment vehicle fueling and maintenance, storage in bunded area, no on-site fabrication, oil spill kits, equipment & vehicle inspections • All chemicals and toxicants to be used for the construction must be stored outside the channel system and in a bunded areas • Adequate sanitary facilities and ablutions on the servitude must be provided for all personnel throughout the project area. Use of these facilities must be enforced (these facilities must be kept clean so that they are a desired alternative to the surrounding vegetation • No dumping of construction material on site may take place	**E1+D1+I2=C4** **C4 X P1=S4** **Low**	Reduction in the water quality of the tributary of the Klein Juskei River
Pathogen inputs (i.e. disease-causing organisms)		• The manager or any other responsible individual at the residential development must be tasked with reporting any sudden bad smells from watercourses that might indicate leaks or bursts as well as any leaking pipes in general • Leaks and pipe bursts relevant to sewerage systems are unlikely, but possible. An action plan must be implemented to react on burst pipes and potential sewerage leaks.		
14. Air quality impacts				
Vehicular movement and disturbance associated with construction activities may lead to generation of dust and exhaust gases from construction vehicles working on site will compromise the ambient air quality	**E1+D2+I1=C4** **C4 X P2=S8** **Medium Negative**	• The Contractor must provide and maintain a method statement for "dust control". The method statement must provide information on the proposed source of water to be utilised and the details of any licenses or permits required. • The construction site must be watered during dry and windy conditions to control dust fallout. • Dust production must be controlled by regular watering of access roads and roads and working areas, should the need arise. Other dust suppressant methods must also be considered to conserve water • Construction vehicles must adhere to low speeds to avoid the generation of dust on the construction site • All vehicles transporting material that can be blown off (e.g. soil, rubble, etc.) must be covered with a tarpaulin, and adhere to speed limits on public roads	**E1+D1+I2=C4** **C4 X P1=S4** **Low**	Complaints from the neighboring residents and businesses

		• All construction vehicles must be maintained to avoid adverse impacts on air quality as a result of a lack of maintenance		
15. Visual and aesthetic impacts:				
Construction sites are generally unsightly and can affect an area's sense of place especially due to excavations, waste, rubble, storage of construction material etc.	**E2+D2+I3=C7** **C7 X P2=S14** **High Negative**	• Clearly demarcate the construction site to limit the area of disturbance • Locate construction site and stockpiles in the least visible area • Remove all waste, including cleared vegetation from site as soon as possible unless the material will be reused on site. A dedicated area for the placement of waste must be identified and demarcated • The landscape must be rehabilitated in such a way that it corresponds to the surrounding landscape	**E1+D2+I1=C4** **C4 X P2=S8** **Medium Negative**	Complaints from the neighbouring residents
16. Unearthing of features of heritage, cultural or archaeological value and Palaeontological artefacts				
The construction activities (i.e. excavations) may result in unearthing, damage or loss of valuable heritage resources	**E1+D2+I1=C4** **C4 X P2=S8** **Medium Negative**	• Should features of paleontological (fossils) or archeological significance (graves) be encountered during construction work, work must be immediately be stopped and immediately be reported to a paleontologist or heritage practitioner so that an investigation and evaluation of the finds can be made • The Contractor must be trained to recognise any heritage features • Under no circumstances shall any artefacts be removed, destroyed or interfered with by anyone on the site	**E1+D1+I2=C4** **C4 X P1=S4** **Low**	-Destruction of features of heritage or paleontological significance
17. Economic Impacts during Construction				
The project will also create numerous sub-contracting opportunities (e.g. tiling, paving, security, plant-hire and fencing) for small contractors. Together	**E1+D2+I1=C4**	• In the light of challenges faces by low income housing projects in South Africa it is imperative that a transparent and fair process is followed in the procurement and management of contractors. Project management should be based on the requirements of National Treasury's SIPDM • Since the project will be conducted in a small and intimate neighbourhood it	**E1+D2+I2=C5** **C5 X P2=S10**	

with the induced impact9the spending on suppliers could add to another 83 jobs, most likely created within the CoJ.	**C4 X P2=S8** **Medium Positive**	is highly recommended that the main project manager introduces the contractor to the local community, informing the community of the contents of the contract management plan. • Adhere to Gauteng Government procurement requirements. If no particular procurement policy applies, a certain percentage could be set aside to vulnerable groups, e.g. females, youth and disabled workers. The Gauteng Department of Roads for example require that 40% of construction jobs should be set aside for females, 60% to youth and 2% to disabled workers. It is also required that the contractor should provide the necessary skills training to people directly employed by the project. • Communicate job and contractor opportunities and recruitment processes through the local media and local civic organisations • Develop and implement a contractor management plan and include specifications for: - Up-skilling of unskilled local labour - Sub-contracting to SMMEs (% of contract value) - % of contract value to be allocated to black owned and female owned companies • As part of the infrastructure maintenance plan required for public/government it is recommended that preference is given to use willing unskilled , and semi-skilled people residing in the residential development •	**Medium Positive**	
18. Roads and Transport Services				
Impacts from transportation of workforce, movement of construction vehicles, and speed limits)	**E1+D2+I1=C4** **C4 X P2=S8** **Medium Negative**	• Establish a forum between the local Residents Association(s) and the main contractor and meet every second month basis to discuss socio-economic issues and project progress • Access roads and entrances to the site should be carefully planned to limit any intrusion impacts, noise and dust pollution, as well as to limit any risks of accidents. • Construction vehicles should adhere to the speed levels. • Construction vehicles and those transporting materials and goods should be inspected to ensure that these are in good working order and not overloaded. • Local roads surrounding the site should be upgraded to ensure that heavy vehicles can deliver the required equipment and materials and to limit the negative intrusions and traffic congestions. • Source material and goods locally as far as possible to limit transportation of these over long distances • Construction workers should be confined to the construction area as far as possible, and should be easily identified.	**E1+D1+I2=C4** **C4 X P1=S4** **Low**	
19. Increase in noise and dust levels, as well as movement of vehicles during the construction phase				
Transportation of building material using local roads, construction noise, Littering on and around the site				

	E1+D2+I1=C4 **C4 X P2=S8** **Medium Negative**	• Construction activities should keep to normal working hours e.g. 7 am until 5 pm. • Noise should be kept to the minimum. • The construction area should be fenced to avoid unauthorised entry by animals or children. • Construction vehicles should adhere to the speed levels. • Dust suppression methods should be implemented on-site if and where required	**E1+D1+I2=C4** **C4 X P1=S4** **Low**	
20. Community safety				
Inflow of these temporary workers could result in various negative social impacts (crime, safety issues, construction related safety risks)	**E1+D2+I1=C4** **C4 X P2=S8** **Medium Negative**	• Before construction commences, representatives from the CoJ, the ward councillors and Residents Associations, as well as neighbouring communities should be informed of the details of the construction company, size of the workforce and construction schedules • On-site construction workers should always be supervised. • Construction activities should be kept to normal working hours e.g. from 7 am until 5 pm during weekdays. • Property owners surrounding the construction areas should be informed of the construction schedules and activities. • Security on-site should be active prior to the construction period. • Workers conduct should be guided by a code of conduct to be developed by the contractors. • The construction areas should be fenced to avoid unauthorised entry by animals or children • Facilitate the speedy repair of streetlights between CoJ and residents	**E1+D1+I2=C4** **C4 X P1=S4** **Low**	Increase in criminal activities
21. Health and safety impacts				
The construction work that will be required may have health and safety implications for the personnel that will be working on the project	**E1+D2+I1=C4** **C4 X P2=S8** **Medium Negative**	• Contractor must appoint a Health and Safety Officer for the construction phase of the project • Limit access to the construction site to the workforce only • Suitable Personal Protective Equipment (PPE) must be worn at all times by all employees on site • The contractor must ensure that all emergency procedures are in place prior to commencing work. Emergency procedures must include (but not be limited to) fire, spills, contamination of soil, accidents to employees and limiting casual access to the construction site for workers, use of hazardous substances and materials, etc. • The Contractor must ensure that lists of all emergency telephone numbers /	**E1+D1+I2=C4** **C4 X P1=S4** **Low**	High injury or fatality incidents

		contact persons are kept up to date and that all numbers and names are posted at relevant locations throughout the construction site • The nearest emergency service provider must be identified during all phases of the project as well as its capacity and the magnitude of accidents it will be able to handle. The contact details of this emergency centre, including police and ambulance services must be available at prominent locations around the construction site		
OPERATION PHASE IMPACTS				
1. **Loss of floral habitat and floral species diversity)**	**E1+D2+I1=C4** **C4 X P2=S8** **Medium Negative**	• Erosion as a result of infrastructure development and alteration of storm water runoff patterns. • An increase in alien and invasive floral species as a result of disturbance. • Compaction of soils due to vehicular movement leading to reduced vegetation cover and habitat loss. • Dust generation. • Loss of terrestrial habitat connectivity along the open space corridor. • Littering and dumping of waste material outside of designated areas. • Landscaping activities leading to an increase in alien and invasive species and altered floral habitat. • Ineffective rehabilitation of exposed and impacted areas and failure to implement alien floral control and eradication measures leading to ongoing proliferation of alien and invasive floral species. • Compaction of soils reducing floral re-establishment success. • Ongoing disturbance of any remaining natural vegetation within the study area during the operational phase. • A significant increase in the number of people utilising the open space area may lead to increased disturbance in this area. • Alien plant proliferation within disturbed areas should be controlled through the implementation of an alien and invasive species management plan. • Disturbed and compacted areas must be ripped, reprofiled and revegetated with an indigenous grass species mixture, specific to the Egoli Granite • As part of the landscaping of the proposed development, if considered, indigenous grassland floral species could be reintroduced into communal gardens. • No collection of floral SCC or medicinal floral species may be allowed by construction personal or future residents of the proposed housing units. • Edge effect management needs to be implemented to ensure no further degradation and potential loss of floral SCC outside of the proposed project footprint area.	**E1+D2+I1=C4** **C4 X P2=S8** **Medium Negative**	Permanent loss of indigenous or TOPS floral species
2. Loss of floral species diversity			**E1+D1+I2=C4** **C4 X P1=S4** **Low**	
3. Loss of potential floral SCC				
These impacts will result from				

landscaping activities , soil disturbance, alien invasive, dust generation, other anthropogenic activities)during the operational phases of the project				
4. Destruction of fauna habitat and loss of habitat heterogeneity	**E1+D2+I1=C4** **C4 X P2=S8** **Medium Negative**	• Utilise the soil in private gardens or for landscaping and berms or level out over areas of low sensitivity. Do not leave the mounds in place after construction. • Conduct soil stripping and stockpiling during the dry season or ensure adequate erosion control and sediment traps are in place to prevent down-slope impacts. • Ensure policies are in place to prevent body corporates / residents from planting AI species or hardscaping areas within moderately sensitive areas. • Where areas not targeted for development are inadvertently impacted and / or damaged, • clear any material dumped and rehabilitate the site as soon as possible.	**E1+D1+I2=C4** **C4 X P1=S4** **Low**	Failure for fauna to re-establish in the area following rehabilitation.
5. Disturbance to fauna through noise, vibration, dust and emigration of fauna from site.	**E1+D1+I2=C4** **C4 X P1=S4** **Low**	• Any fencing erected in areas of moderate sensitivity must provide for animal migration to allow fauna to escape development areas. • Establish indigenous gardens and consider establishing bird and bat boxes in and around residential areas to attract local species to the site. • Ensure dust suppression, through water sprinkling, is applied at time of high dust generation. • Noisy point-sources should be enclosed to prevent excessive noise. • Ensure policies are in place to ensure residents do not generate excessive noise on site and maintain urban noise level limits.	**E1+D1+I2=C4** **C4 X P1=S4** **Low**	Continued noise impacts will prevent burrowing fauna from re-establishing in natural areas adjacent to the development.
6. Attraction of pests and exotic / alien species	**E1+D1+I2=C4** **C4 X P1=S4** **Low**	• Food waste including domestic waste, is placed in sealed containers, and not exposed on site. • Ensure that the outside areas are kept clean and tidy and provide adequate waste removal services to prevent the attraction of rats and other alien scavenging species to the site. • Ensure policies are in place to prevent residents from planting AI species. • Clear all domestic and food waste from site on a daily basis.	**E1+D1+I2=C4** **C4 X P1=S4** **Low**	Not attempting to control or preventing the worsening of alien invasive infestation will cause a decline in indigenous species.
7. Hindrance, trapping, killing of fauna	**E1+D1+I2=C4** **C4 X P1=S4**	• Policies must be in place to ensure residents do not kill indigenous fauna. • Policies with residents should include control of potentially toxic substances to fauna which will be stored and handled in a manner that prevents exposure of the toxin to the environment	**E1+D1+I2=C4** **C4 X P1=S4**	Killing or trapping of indigenous fauna.

	Low		**Low**	
8. Contamination of fauna environment through use and storage of hazardous substances, littering and dumping of waste or sewage leaks	**E1+D1+I2=C4** **C4 X P1=S4** **Low**	• All waste (domestic, hydrocarbon, hazardous) must be managed in line with the prescribed waste management plan. • Refuse bins with properly secured lids will be placed around site to collect waste for separation, recycling and disposal. Waste (domestic, construction, hazardous) should be recycled as far as possible and sold/given to interested contractors. Recyclable waste should not be stored for excessive periods.	**E1+D1+I2=C4** **C4 X P1=S4** **Low**	Large spills or continuous cumulative leaks and waste dumping that are not cleaned up will enter the environment through run-off and contaminate the environment and poison the fauna.
9. *Impact on surrounding water resources and delineated wetland buffer* *This will occur as a result of increase in sediment inputs & turbidity, Alterations of flow volumes and patterns of flows (increased flood peaks), Increased in nutrient inputs and toxic organic contaminants and Alteration of acidity (pH), Inputs of toxic heavy metal contaminants*	**E2+D2+I3=C7** **C7 X P2=S14** **High Negative**	• A proper stormwater management plan must be incorporated, which includes various attenuation ponds that not only diffusely releases flows into the river system, but also assimilates toxicants by means of bioretention. Strict rules must be incorporated to residents regarding the disposal of refuse, dirty water and washing cars within the property. • An action plan must be implemented to react on burst pipes and potential sewerage leaks. • A sewerage system will have to be installed to accommodate the proposed development. Even though leaks and bursts on well-engineered sewerage pipelines are unlikely, an action plan must be set in place for such an event.	**E1+D2+I1=C4** **C4 X P2=S8** **Medium Negative**	Reduction in water quality
Pathogen inputs (i.e. disease-causing organisms)	**E1+D2+I1=C4** **C4 X P2=S8** **Medium Negative**		**E1+D1+I2=C4** **C4 X P1=S4** **Low**	Poisoning of aquatic biodiversity.
10. Access to Improved Housing/ Reduction of Housing Backlogs	**E1+D2+I1=C4** **C4 X P2=S8** **Medium Positive**	• More information with regards to the cost of the transaction and the time it takes to access mortgage, further administrative, policy and legislative processes is required for potential buyers. • Lessons learned by the Transaction Support Centre established in Khayelitsha, Western Cape, as a pilot action-research initiative could be used as enhancement measure	**E1+D2+I2=C5** **C5 X P2=S10** **Medium Positive**	Increased housing backlog

11. Impact on Local Property Values	**E1+D2+I2=C5** **C5 X P2=S10** **Medium Negative**	• Design the development in such a way as to blend in with the local environment	**E1+D2+I1=C4** **C4 X P2=S8** **Medium Negative**	Decreased property values
12. Impact on roads and transport services	**E1+D2+I2=C5** **C5 X P2=S10** **Medium Negative**	• Access roads and entrances to the site should be carefully planned to limit any intrusion impacts, noise and dust pollution, damage to the road surfaces, as well as to limit any risks of accidents. • Upgrading of local roads (e.g. Cork Avenue and Fleet Street) could be required to accommodate the increased traffic patterns. • Gauteng Department of Human Settlements to liaise with Gauteng Department of Transport to expand the bus service to the site area in order to make public transport to the site more accessible, for especially school-going children • Consider the development of a bus stop and shelter closer to the proposed site that would adhere to road safety standards	**E1+D2+I1=C4** **C4 X P2=S8** **Medium Negative**	Increased traffic
13. Impact on social infrastructure	**E1+D2+I1=C4** **C4 X P2=S8** **Medium positive**	• The proposed development could include a recreational area for the residents, including a play area for small children. • The public transport system should be extended to reach the proposed development to assist residents and children with regards to ease of travelling, especially at night. Taxi and bus services would thus have to be extended to reach a point in close proximity of the development. • Consider the development of a bus stop and shelter closer to the proposed site that would adhere to road safety standards. • The Gauteng Department of Human Settlement should take note of the possible impact on the existing schools and could assist to address the issue, in cooperation with the Gauteng Department of Education. The Gauteng Dept. of Education could assist in distributing the children among the different schools and attend to the matter of school fees and qualifications in this regard.	**E1+D2+I2=C5** **C5 X P2=S10** **Medium Negative**	Increased pressure on existing social infrastructure

		• Gauteng Department of Human Settlements to liaise with Gauteng Department of Transport to expand the bus service to the site area in order to make public transport to the site more accessible, for especially school-going children • Consider renewable technologies (e.g. eco-toilets, solar energy and rainwater harvesting) in the design of the development to not only reduce pressure on the over-burdened and ageing municipal network in the local area, but also to reduce the impact on the environment, especially considering other proposed housing developments within the area . This especially relevant if there is there municipal upgrading programme on the cards in the foreseeable future. • The Gauteng Department of Human Settlement and the CoJ need to be involved in the planning and Environmental Impact Assessment Process to determine the need for bulk services or upgrading of existing services in order to pro-actively plan for the proposed development		
14. Impact on community safety	**E1+D2+I2=C5** **C5 X P2=S10** **Medium Negative**	• The development should implement safety and security features as part of the development e.g. access control, security guards patrolling the area, and the placement of security cameras at strategic places. • Lighting as security measure at night should be implemented as part of the development • Sub-letting as part of this development should not be allowed to ensure that the quality of life of the residents in the area remain high. • The local policing services should respond effectively to any criminal activities, but should further focus on street crimes, assaults, and robberies • Facilitate the speedy repair of streetlights between CoJ and residents	**E1+D1+I2=C4** **C4 X P1=S4** **Low**	Increase in criminal activities in the area
15. Impact on Urban Transport	**E1+D2+I2=C5** **C5 X P2=S10** **Medium Negative**	• People who work in the local area but travel large distances from other areas in CoJ should also be a priority consideration in the housing allocation process	**E1+D2+I1=C4** **C4 X P2=S8** **Medium Negative**	Increase in traffic
16. Impact on social cohesion and sense of place	**E2+D2+I3=C7** **C7 X P2=S14**	• No mitigation for the loss of land-use and impact on sense of place can be recommended, apart from considering alternative sites within the area for the proposed development. • Should the development continue, building designs should take the character of the area into account and should not detract from the existing sense of	**E1+D2+I2=C5** **C5 X P2=S10**	Increased conflict and unhappiness in the community

	High Negative	place • Designing of walls, roofs and buildings should be done in such a manner to blend in with the natural environment. • Lighting issues should receive the attention it deserves to avoid any light pollution at night but still ensure that safety requirements are met. • Consultation with the local community on the design of the building as part of CoJ building legislation for rezoning	**Medium Negative**	

Alternative 3 - Site Layout excluding the rocky outcrop				
Potential impacts:	**Significance rating of impacts (positive or negative):**	**Proposed mitigation:** (***Please also refer to the draft EMPr, Specialist assessment for other mitigation measures***)	**Significance rating of impacts after mitigation:**	**Risk of the impact** and **mitigation not being implemented**
CONSTRUCTION PHASE IMPACTS				
22. Reduction in Loss of floral habitat compared to the proposal, Site Layout 1 and 2				
Loss of floral habitat may result from various activities (clearance of vegetation, destruction of habitat, soil disturbance, alien invasive, dust generation, other anthropogenic activities) during the construction and operational phases of the project	**E2+D2+I3=C 7** **C7 X P2=S14** **High Negative**	• The location and extent of areas of increased ecological importance and sensitivity (such as the rocky grassland areas) should be considered during the pre-construction and planning phases. It is recommended that the high ecological sensitivity rocky grassland vegetation unit be excluded from the development footprint. As far as possible, conservation of the bouldered rocky outcrop and woodland vegetation units should also be considered. The extent of the watercourse and associated buffer zone (to be recommended by the wetland specialist/ freshwater ecologist) should also be taken into account when developing the project layout. • In planning the project, habitat connectivity between the residential units in the form of green spaces and the surrounding natural areas should be considered. • The amount of vegetation cleared for construction purposes should be limited to only what is required.	**E1+D2+I2=C5** **C5 X P2=S10** **Medium Negative**	Permanent loss of habitat

		• Site camps and other temporary infrastructure are to be placed within areas that are already disturbed or transformed. • Access to the development area should be from the main road to the north or east of the study area and not through open space areas. No open space areas beyond the approved development footprint area, including the Bryanston River and associated buffer zones may be accessed by construction personnel or construction vehicles and should be treated as a No-Go zone. • All sensitive areas, including high sensitivity vegetation units outside of the development footprint should be clearly indicated on site and be off limits for construction vehicles and workers. • Construction vehicles should be restricted to travelling only on designated roadways, to limit the ecological footprint of the proposed development activities, and no new roads through natural vegetation may be constructed. • Edge effects from construction activities, such as erosion and alien floral species proliferation and spread, should be managed throughout the development, to prevent impacts on the open space area, especially further proliferation of alien species. • No littering or dumping of waste and construction material within natural areas to be excluded from the development footprint areas may be allowed. All excess material must be removed from the construction areas once works has been completed. • Alien plant proliferation within disturbed areas should be controlled through the implementation of an ongoing monitoring and eradication programme for all invasive and weed plant species occurring within the study area, with specific emphasis on the eradication of NEMBA Category 1b invasive species. • Eradication of *Campuloclinium macrocephalum* should take place within the open space area regardless of whether the project proceeds or not. • Any disturbed and compacted areas outside of the immediate development footprint areas must be ripped, reprofiled and revegetated with an indigenous grass species mixture upon completion of construction works. Only indigenous plant species naturally growing within the region (refer to Appendix B) of Floral Impact Assessment Study. • As part of the landscaping for the residential units, if considered, it is strongly recommended that an indigenous species approach be implemented, which will also impact positively on management, water use and sustainability of any landscaped areas. Such an approach will also improve habitat provision for indigenous faunal species. • The use of indigenous *Cynodon dactylon* lawn, if considered, is recommended instead of *Pennisetum clandestinum* (Kikuyu) or		
23. Reduction of Loss of floral species diversity compared to the proposal, Site Layout 1 and 2				
Loss of floral species diversity may result from various activities (Clearing of vegetation in sensitive areas, Movement of construction and operational vehicles, alien invasives, soil disturbances) during the construction and operational phases of the project	**E2+D2+I3=C 7** **C7 X P2=S14** **High Negative**		**E1+D2+I2=C5** **C5 X P2=S10** **Medium Negative**	Loss of floral species

		Dactyloctenium australe (LM) lawn. Mowed veldgrass instead of monospecific lawn may also be considered.		
24. Reduction in Loss of floral SCC compared to the proposal, Site Layout 1 and 2				
Loss of potential floral SCC may result from various activities (Clearing of vegetation in sensitive areas, removal of medicinal/protected species, Movement of construction and operational vehicles, alien invasives, soil disturbances) during the construction and operational phases of the project	**E1+D2+I2=C5** **C5 X P2=S10** **Medium Negative**	• Areas such as the Rocky Grassland vegetation unit, where known floral SCC in the form of provincially protected floral species occur and where habitat is available for further potential floral SCC to occur, should be excluded from the proposed development footprint. • Floral SCC present within the study should ideally be conserved *in situ.* • During the planning and surveying phase of surface infrastructure, any floral SCC that may be potentially affected by surface infrastructure (such as *Hypoxis hemerocallidea*) must be marked and where possible, relocated to suitable, similar open space habitat in the surrounding area. Relevant permits must be applied for from local authorities, depending on the status of the species, prior to the construction phase. • Should any floral SCC not encountered during the field assessment be noted within the study area, these species should be relocated to similar habitat within or in the vicinity of the study area with the assistance of a suitably qualified specialist, after the authorities have been notified. • No collection of floral SCC or medicinal floral species may be allowed by construction personal or future residents of the proposed housing units. • Edge effect management needs to be implemented to ensure no further degradation and potential loss of floral SCC outside of the proposed project footprint area.	**E1+D1+I2=C4** **C4 X P1=S4** **Low**	Permanent loss of floral species
25. Reduction in Destruction of fauna habitat and loss of habitat heterogeneity compared to the proposal, Site Layout 1 and 2				
Development of the site will result in loss of habitat heterogeneity, reduce the interconnectivity between the different habitat types, reduce the width of the ecological corridor, and significantly reduce the function of the ecological node	**E1+D2+I2=C5** **C5 X P2=S10** **Medium Negative**	• **STOP**: No activities are to commence within the wetlands and buffers (100m buffer) until the necessary authorisations are obtained under the National Water Act (NWA) and NEMA. • No activities should take place in areas designated as highly sensitive (NO-GO AREAS) as per Plan 5. • **MODIFY**: Areas designated as low sensitivity must be targeted for physical development. • Areas of moderate sensitivity within the development area should be targeted for indigenous green space or green drainage lines. The ecological connectivity between moderately sensitive areas targeted for inclusion into development areas and highly sensitive areas must be maintained through palisade fencing or tunnels in walls that will allow for at least a cat-sized animals to move through. • Plan and implement a proper engineered storm-water management plan	**E1+D1+I2=C4** **C4 X P1=S4** **Low**	Loss of faunal and faunal disturbance

		from the onset to prevent excessive runoff and associated erosion and sedimentation in downstream habitats. • **CONTROL**: Peg out and demarcate areas for development and no-go areas before commencing with any activities. No activity, whatsoever, should occur in no-go areas. • Maintain areas of physical disturbance as small as possible to limit the area of disturbance. • Plan for material stockpiles (topsoil and subsoil and excavated rock) within the areas designated as low sensitivity. Utilise the soil in private gardens or for landscaping and berms or level out over areas of low sensitivity. Do not leave the mounds in place after construction. • Conduct soil stripping and stockpiling during the dry season or ensure adequate erosion control and sediment traps are in place to prevent down-slope impacts. • Ensure policies are in place to prevent body corporates / residents from planting AI species or hardscaping areas within moderately sensitive areas. • **REMEDY**: Where areas not targeted for development are inadvertently i		
26. Reduction in Disturbance to fauna through noise, vibration, dust and emigration of fauna from site compared to the proposal, Site Layout 1 and 2				
The site neighbours developed areas (roads and residential areas) on its western and northern boundary and the site experiences some of these impacts on a daily basis.	**E1+D2+I1=C4** **C4 X P2=S8** **Medium Negative**	• **STOP**: No activities are to take place in areas designated as highly sensitive as per Plan 5. • **MODIFY**: Commence with primary excavation and earth-moving activities during the dry season as far as possible when bird populations are likely to be lower (most migrant species will be absent and birds are unlikely to have chicks or fledglings). This will also benefit other seasonally breeding fauna. • Utilise quieter equipment where feasible. • Any fencing erected in areas of moderate sensitivity must provide for animal migration (see mitigations for Impact 1] to allow fauna to escape development areas. • Establish indigenous gardens and consider establishing bird and bat boxes in and around residential areas to attract local species to the site. • **CONTROL**: Ensure dust suppression, through water sprinkling, is applied at time of high dust generation. • Noisy point-sources should be enclosed and equipment / machinery fitted with silencers. All equipment / machinery will be serviced and maintained within operating specifications to prevent excessive noise. • Ensure policies are in place to ensure residents do not generate excessive noise on site and maintain urban noise level limits. •	**E1+D1+I2=C4** **C4 X P1=S4** **Low**	Disturbance of fauna
27. Attraction of pests and exotic / alien species				
Several urbanised exotic and		• **MODIFY**: Maintaining and improving local indigenous populations could		Scavenging

alien invasive species are already present in the area. Activities, such as leaving food and food waste out, could attract additional species or individuals to site which must be avoided.	**E1+D2+I2=C5** **C5 X P2=S10** **Medium Negative**	assist in reducing alien species numbers on site through competition. Therefore maintain indigenous gardens on site. Consider • establishing bird/bat boxes to attract local species back to the site. • **CONTROL**: Compile and implement an alien invasive management plan in line with the municipal management plan, which must include measures to prevent attracting additional alien avifauna and mammals to site. This should include not feeding wild life and ensuring that all food and food waste, • including domestic waste, is placed in sealed containers and not exposed on site. Ensure that the outside areas are kept clean and tidy and provide adequate waste removal services to prevent the attraction of rats and other alien scavenging species to the site. • Ensure policies are in place to prevent residents from planting AI species. • **REMEDY**: Clear all domestic and food waste from site on a daily basis	**E1+D1+I2=C4** **C4 X P1=S4** **Low**	
28. Hindrance, trapping, killing of fauna				
Most fauna will escape the construction site, but removal of all burrowing species will be impossible and some fauna species will be lost through excavation activities. Any fauna trapped on site should be removed as far as possible to prevent loss of fauna. This is applicable to all groups of fauna, from invertebrates to mammals.	**E1+D2+I1=C4** **C4 X P2=S8** **Medium Negative**	• **STOP**: No poisons against fauna are to be brought on site; where this is not possible any substance that could be toxic to fauna will be stored and handled in a manner that will prevent exposure of the substance to the environment. • No deliberate killing or trapping of indigenous fauna is allowed on site, unless trapping is done by a specialist to remove the specimen from the area. Any requirements of the Gauteng Nature Conservation • Ordinance must be complied with regarding handling of such species. • **MODIFY:** Limit overhead lines to only areas of low sensitivity; any overhead lines over moderately or highly sensitive areas will be fitted with bird deterrents. • **CONTROL**: Environmental awareness training must include the prohibition of any harm or hindrance to any indigenous fauna species and the consequences of such actions. Staff should also be provided a list of potential TOP species on site to specifically ensure these species are protected. • Policies must be in place to ensure residents do not kill indigenous fauna. • Policies with residents should include control of potentially toxic substances to fauna which will be stored and handled in a manner that prevents exposure of the toxin to the environment. • **REMEDY**: Contracts with contractors must specify actions that will be taken against contractors who do not conduct activities in line with the EMP. • Ensure safe speed limits and working conditions on the site. •	**E1+D1+I2=C4** **C4 X P1=S4** **Low**	Loss and faunal disturbance
29. Contamination of fauna environment through use and storage of hazardous substances, littering and dumping of waste or sewage leaks				
The proximity of the tributary to the site means that any		• **STOP**: Discontinue use of all faulty machinery / equipment on site until properly repaired. Ensure a waste management plan has been compiled in		Loss of fauna

contaminants spilled on site will enter the tributary fairly quickly during a rainfall event and disperse contaminants to downstream environments. Therefore all contaminating substances, including waste and sewage, must be handled properly on site	**E1+D2+I1=C4** **C4 X P2=S8** **Medium Negative**	line with the National Environmental Management: Waste Act (NEM:WA) highlighting handling and storage of various wastes on site, in line with prescribed standards before any activities commence on site. • All toxic and hazardous substances will have adequate storage facilities available on site, in line with relevant prescribed requirements, before being brought to site. • **MODIFY**: Due to proximity of petrol stations, hydrocarbon storage on site during construction should be limited to daily needs only. • Repairs to vehicles will be conducted off-site and where this is not possible the underlying ground will be covered with impermeable sheet and pans. • Plan and implement a proper storm-water management plan from the onset, which must incorporate a hydrocarbon collection system for the workshop and parking area. • Provide for adequate portable toilets for the number of staff on site. • **CONTROL**: All equipment / machinery will be serviced and maintained within operating specifications to prevent the risks of leak. • Hydrocarbons (new and used) must be properly stored and handled according to prescribed manner and must in no way be exposed to the environmental elements. • Any cars, machinery or equipment parked on site will either be parked on a concrete slab or have pans placed under them to collect all drips and potential leaks. • Keep portable toilets clean and hygienic. Portable toilets will properly managed and emptied regularly to prevent overflow and leaks. • All waste (domestic, hydrocarbon, hazardous) must be managed in line with the prescribed waste management plan. • Refuse bins with properly secured lids will be placed around site to collect waste for separation, recycling and disposal. Waste (domestic, construction, hazardous) should be recycled as far as possible and sold/given to interested contractors. Recyclable waste should not be stored for excessive periods	**E1+D1+I2=C4** **C4 X P1=S4** **Low**	
30. Contamination of fauna environment through use and storage of hazardous substances, littering and dumping of waste or sewage leak				
Waste will be stored according to the Norms and Standards for Storage of Waste.	**E1+D2+I1=C4** **C4 X P2=S8** **Medium Negative**	• All hydrocarbons spills on bare ground will be cleared immediately. This will include the lifting of the contaminated soil for bio-remediation or disposal to a hazardous waste facility. • Inspect and clear all litter and waste from the site and surrounds. • Toilets and general plumbing will be regularly checked for leaks which will be attended to immediately. • Repair and clean any sewage leaks immediately.	**E1+D1+I2=C4** **C4 X P1=S4** **Low**	Degradation of environment

31. Less Displacement of Red List species as a result of habitat loss or transformation compared to the proposal, Site Layout 1 and 2				
Avifaunal habitat is cleared to accommodate the proposed Bryanston Ext. 3B Housing development, reducing the amount of habitat available to birds for foraging, roosting and breeding	**E1+D2+I2=C5** **C5 X P2=S10** **Medium Negative**	• Cannot be mitigated fully. Loss of habitat is inevitable with the construction of the residential development. • Construction activity is restricted to the immediate footprint of the infrastructure. • The recommendations of the ecological specialist studies must be strictly implemented, especially as far as limitation of the construction footprint and rehabilitation of disturbed areas are concerned.	**E1+D2+I1=C4** **C4 X P2=S8** **Medium Negative**	Loss of avifaunal species
32. Less Displacement of Avifaunal species as a result of disturbance compared to the proposal, Site Layout 1 and 2				
Displacement of Red List species as a result of disturbance associated with the construction of the Bryanston Ext 3B Housing development (i.e. noise and movement of construction and operational equipment and personnel) resulting in a negative direct impact on the resident avifauna	**E1+D2+I2=C5** **C5 X P2=S10** **Medium Negative**	• Cannot be mitigated fully. Disturbance is inevitable with the construction of the Bryanston Ext. 3B Housing development. arelikely to have dire consequences for African Finfoot	**E1+D2+I1=C4** **C4 X P2=S8** **Medium Negative**	Loss of avifaunal species
33. Reduced Mortality of Red List species compared to the proposal, Site Layout 1 and 2				
Direct mortality of Red List species, particularly ground nesting bird, as a result of construction activities associated with the Bryanston Ext 3B Housing development resulting in a negative direct impact on the resident avifauna	**E1+D2+I1=C4** **C4 X P2=S8** **Medium Negative**	• Conduct an avifaunal inspection prior to the construction phase of this project. • Should nests or breeding locations, pertaining to Red List and other more common species, be identified during the inspection, mitigation must be implemented to ensure that this impact is reduced to negligible levels	**E1+D1+I2=C4** **C4 X P1=S4** **Low**	Loss of faunal species
34. Reduced Impact on surrounding water resources				

Increase in sediment inputs & turbidity	**E1+D2+I2=C5** **C5 X P2=S10** **Medium Negative**	• Sediment traps must be installed together with erosion monitoring in and around the project area. The proposed development must be undertaken during the dry season.	**E1+D2+I1=C4** **C4 X P2=S8** **Medium Negative**	Contaminations of water resources
Alterations of flow volumes and patterns of flows (increased flood peaks	**E1+D1+I2=C4** **C4 X P1=S4** **Low**	• An attenuation pond must be constructed between the recommended buffer zone and the proposed development to attenuate stormwater and to assimilate toxicants. • A bioretention component must be incorporated into this pond to assist with assimilation of contaminants. Water from this attenuation pond must be diffusely redistributed into the river system to the east; and • It is recommended that the buffer zone of 30 m be adhered to. • all watercourses be demarcated as sensitive areas, and no construction activity, laydown yards, camps or dumping of construction material are to be permitted within the sensitive zones (where possible)	**E1+D1+I2=C4** **C4 X P1=S4** **Low**	Contaminations of water resources
Increased in nutrient inputs and toxic organic contaminants and Alteration of acidity (pH)	**Very Low**	• Off-site equipment vehicle fuelling and maintenance, storage in bunded area, no on-site fabrication, oil spill kits, equipment & vehicle inspections • All chemicals and toxicants to be used for the construction must be stored outside the channel system and in a bunded areas • Adequate sanitary facilities and ablutions on the servitude must be provided for all personnel throughout the project area. Use of these facilities must be enforced (these facilities must be kept clean so that they are a desired alternative to the surrounding vegetation • No dumping of construction material on site may take place	**Very Low**	
Inputs of toxic heavy metal contaminants			Low	
Pathogen inputs (i.e. disease-causing organisms)		• The manager or any other responsible individual at the residential development must be tasked with reporting any sudden bad smells from watercourses that might indicate leaks or bursts as well as any leaking pipes in general • Leaks and pipe bursts relevant to sewerage systems are unlikely, but possible. An action plan must be implemented to react on burst pipes and potential sewerage leaks.		
35. Air quality impacts				
Vehicular movement and	**Medium Negative**	• The Contractor must provide and maintain a method statement for “dust control”. The method statement must provide information on the proposed		Complaints from the neighbouring residents and

disturbance associated with construction activities may lead to generation of dust and exhaust gases from construction vehicles working on site will compromise the ambient air quality		source of water to be utilised and the details of any licenses or permits required. • The construction site must be watered during dry and windy conditions to control dust fallout. • Dust production must be controlled by regular watering of access roads and roads and working areas, should the need arise. Other dust suppressant methods must also be considered to conserve water • Construction vehicles must adhere to low speeds to avoid the generation of dust on the construction site • All vehicles transporting material that can be blown off (e.g. soil, rubble, etc.) must be covered with a tarpaulin, and adhere to speed limits on public roads • All construction vehicles must be maintained to avoid adverse impacts on air quality as a result of a lack of maintenance	Low	businesses
36. Visual and aesthetic impacts:				
Construction sites are generally unsightly and can affect an area's sense of place especially due to excavations, waste, rubble, storage of construction material etc.	**E1+D2+I1=C4** **C4 X P2=S8** **Medium Negative**	• Clearly demarcate the construction site to limit the area of disturbance • Locate construction site and stockpiles in the least visible area • Remove all waste, including cleared vegetation from site as soon as possible unless the material will be reused on site. A dedicated area for the placement of waste must be identified and demarcated • The landscape must be rehabilitated in such a way that it corresponds to the surrounding landscape	**E1+D1+I2=C4** **C4 X P1=S4** **Low**	Complaints from the neighbouring residents
37. Unearthing of features of heritage, cultural or archaeological value and Palaeontological artefacts				
The construction activities (i.e. excavations) may result in unearthing, damage or loss of valuable heritage resources	**E1+D2+I1=C4** **C4 X P2=S8** **Medium Negative**	• Should features of paleontological (fossils) or archaeological significance (graves) be encountered during construction work, work must be immediately be stopped and immediately be reported to a paleontologist or heritage practitioner so that an investigation and evaluation of the finds can be made • The Contractor must be trained to recognise any heritage features • Under no circumstances shall any artefacts be removed, destroyed or interfered with by anyone on the site	**E1+D1+I2=C4** **C4 X P1=S4** **Low**	-Destruction of features of heritage or paleontological significance

38. Economic Impacts during Construction				
The project will also create numerous sub-contracting opportunities (e.g. tiling, paving, security, plant-hire and fencing) for small contractors. Together with the induced impact9the spending on suppliers could add to another 83 jobs, most likely created within the CoJ.	**E1+D2+I1=C4** **C4 X P2=S8** **Medium Positive**	• In the light of challenges faces by low income housing projects in South Africa it is imperative that a transparent and fair process is followed in the procurement and management of contractors. Project management should be based on the requirements of National Treasury's SIPDM • Since the project will be conducted in a small and intimate neighbourhood it is highly recommended that the main project manager introduces the contractor to the local community, informing the community of the contents of the contract management plan. • Adhere to Gauteng Government procurement requirements. If no particular procurement policy applies, a certain percentage could be set aside to vulnerable groups, e.g. females, youth and disabled workers. The Gauteng Department of Roads for example require that 40% of construction jobs should be set aside for females, 60% to youth and 2% to disabled workers. It is also required that the contractor should provide the necessary skills training to people directly employed by the project. • Communicate job and contractor opportunities and recruitment processes through the local media and local civic organisations • Develop and implement a contractor management plan and include specifications for: - Up-skilling of unskilled local labour - Sub-contracting to SMMEs (% of contract value) - % of contract value to be allocated to black owned and female owned companies • As part of the infrastructure maintenance plan required for public/government it is recommended that preference is given to use willing unskilled , and semi-skilled people residing in the residential development	**E2+D2+I3=C7** **C7 X P2=S14** **Positive**	Change in socio-economic status
39. Roads and Transport Services				
Impacts from transportation of workforce, movement of construction vehicles, and speed limits)	**E1+D2+I2=C5** **C5 X P2=S10** **Medium Negative**	• Establish a forum between the local Residents Association(s) and the main contractor and meet every second month basis to discuss socio-economic issues and project progress • Access roads and entrances to the site should be carefully planned to limit any intrusion impacts, noise and dust pollution, as well as to limit any risks of accidents. • Construction vehicles should adhere to the speed levels. • Construction vehicles and those transporting materials and goods should be inspected to ensure that these are in good working order and not	**E1+D2+I1=C4** **C4 X P2=S8** **Medium Negative**	Influx of workers and increase in traffic

		overloaded.		
40. Increase in noise and dust levels, as well as movement of vehicles during the construction phase		• Local roads surrounding the site should be upgraded to ensure that heavy vehicles can deliver the required equipment and materials and to limit the negative intrusions and traffic congestions.		
Transportation of building material using local roads, construction noise, Littering on and around the site	**E1+D2+I1=C4** **C4 X P2=S8** **Medium Negative**	• Source material and goods locally as far as possible to limit transportation of these over long distances • Construction workers should be confined to the construction area as far as possible, and should be easily identified. • Construction activities should keep to normal working hours e.g. 7 am until 5 pm. • Noise should be kept to the minimum. • The construction area should be fenced to avoid unauthorised entry by animals or children. • Construction vehicles should adhere to the speed levels. • Dust suppression methods should be implemented on-site if and where required	**E1+D1+I2=C4** **C4 X P1=S4** **Low**	Influx of workers and increase in traffic
41. Community safety				
Inflow of these temporary workers could result in various negative social impacts (crime, safety issues, construction related safety risks)	**E1+D2+I1=C4** **C4 X P2=S8** **Medium Negative**	• Before construction commences, representatives from the CoJ, the ward councillors and Residents Associations, as well as neighbouring communities should be informed of the details of the construction company, size of the workforce and construction schedules • On-site construction workers should always be supervised. • Construction activities should be kept to normal working hours e.g. from 7 am until 5 pm during weekdays. • Property owners surrounding the construction areas should be informed of the construction schedules and activities. • Security on-site should be active prior to the construction period. • Workers conduct should be guided by a code of conduct to be developed by the contractors. • The construction areas should be fenced to avoid unauthorised entry by animals or children • Facilitate the speedy repair of streetlights between CoJ and residents	**E1+D1+I2=C4** **C4 X P1=S4** **Low**	Criminal incidents
42. Health and safety impacts				
The construction work that will be required may have health and safety implications for the	**E1+D2+I1=C**	• Contractor must appoint a Health and Safety Officer for the construction phase of the project • Limit access to the construction site to the workforce only • Suitable Personal Protective Equipment (PPE) must be worn at all times by all		High injury or fatality incidents

personnel that will be working on the project	**4** **C4 X P2=S8** **Medium Negative**	employees on site • The contractor must ensure that all emergency procedures are in place prior to commencing work. Emergency procedures must include (but not be limited to) fire, spills, contamination of soil, accidents to employees and limiting casual access to the construction site for workers, use of hazardous substances and materials, etc. • The Contractor must ensure that lists of all emergency telephone numbers / contact persons are kept up to date and that all numbers and names are posted at relevant locations throughout the construction site • The nearest emergency service provider must be identified during all phases of the project as well as its capacity and the magnitude of accidents it will be able to handle. The contact details of this emergency centre, including police and ambulance services must be available at prominent locations around the construction site	**E1+D1+I2=C4** **C4 X P1=S4** **Low**	
OPERATION PHASE IMPACTS				
17. **Loss of floral habitat and floral species diversity)**		• Erosion as a result of infrastructure development and alteration of storm water runoff patterns. • An increase in alien and invasive floral species as a result of disturbance. • Compaction of soils due to vehicular movement leading to reduced vegetation cover and habitat loss. • Dust generation. • Loss of terrestrial habitat connectivity along the open space corridor. • Littering and dumping of waste material outside of designated areas. • Landscaping activities leading to an increase in alien and invasive species and altered floral habitat.	**E1+D2+I1=C4** **C4 X P2=S8** **Medium Negative**	Loss of floral species
18. Loss of floral species diversity	**E1+D2+I2=C5** **C5 X P2=S10**	• Ineffective rehabilitation of exposed and impacted areas and failure to implement alien floral control and eradication measures leading to ongoing proliferation of alien and invasive floral species. • Compaction of soils reducing floral re-establishment success. • Ongoing disturbance of any remaining natural vegetation within the study area during the operational phase. • A significant increase in the number of people utilising the open space area may lead to increased disturbance in this area. • Alien plant proliferation within disturbed areas should be controlled through	**E1+D1+I2=C4** **C4 X P1=S4** **Low**	

19. Loss of potential floral SCC	**Medium Negative**	the implementation of an alien and invasive species management plan. • Disturbed and compacted areas must be ripped, reprofiled and revegetated with an indigenous grass species mixture, specific to the Egoli Granite Grassland vegetation type (refer to Appendix B of Floral Impact Assessment Study), upon completion of construction works. • As part of the landscaping of the proposed development, if considered, indigenous grassland floral species could be reintroduced into communal gardens. • No collection of floral SCC or medicinal floral species may be allowed by construction personal or future residents of the proposed housing units. • Edge effect management needs to be implemented to ensure no further degradation and potential loss of floral SCC outside of the proposed project footprint area.	**E1+D1+I2=C4** **C4 X P1=S4** **Low**	
20. Destruction of fauna habitat and loss of habitat heterogeneity	**E1+D2+I1=C4** **C4 X P2=S8** **Medium Negative**	• Utilise the soil in private gardens or for landscaping and berms or level out over areas of low sensitivity. Do not leave the mounds in place after construction. • Conduct soil stripping and stockpiling during the dry season or ensure adequate erosion control and sediment traps are in place to prevent down-slope impacts. • Ensure policies are in place to prevent body corporates / residents from planting AI species or hardscaping areas within moderately sensitive areas. • Where areas not targeted for development are inadvertently impacted and / or damaged, • clear any material dumped and rehabilitate the site as soon as possible.	**E1+D1+I2=C4** **C4 X P1=S4** **Low**	Loss of floral habitat
21. Disturbance to fauna through noise, vibration, dust and emigration of fauna from site.	**E1+D1+I2=C4** **C4 X P1=S4** **Low**	• Any fencing erected in areas of moderate sensitivity must provide for animal migration to allow fauna to escape development areas. • Establish indigenous gardens and consider establishing bird and bat boxes in and around residential areas to attract local species to the site. • Ensure dust suppression, through water sprinkling, is applied at time of high dust generation. • Noisy point-sources should be enclosed to prevent excessive noise. • Ensure policies are in place to ensure residents do not generate excessive noise on site and maintain urban noise level limits.	**E1+D1+I2=C4** **C4 X P1=S4** **Low**	Loss of faunal species
22. Attraction of pests and exotic / alien species	**E1+D1+I2=C4** **C4 X P1=S4** **Low**	• Food waste including domestic waste, is placed in sealed containers, and not exposed on site. • Ensure that the outside areas are kept clean and tidy and provide adequate waste removal services to prevent the attraction of rats and other alien scavenging species to the site. • Ensure policies are in place to prevent residents from planting AI species.	**E1+D1+I2=C4** **C4 X P1=S4** **Low**	Scavenging

		• Clear all domestic and food waste from site on a daily basis.		
23. Hindrance, trapping, killing of fauna	**E1+D1+I2=C 4** **C4 X P1=S4** **Low**	• Policies must be in place to ensure residents do not kill indigenous fauna. • Policies with residents should include control of potentially toxic substances to fauna which will be stored and handled in a manner that prevents exposure of the toxin to the environment	**E1+D1+I2=C4** **C4 X P1=S4** **Low**	
24. Contamination of fauna environment through use and storage of hazardous substances, littering and dumping of waste or sewage leaks	**E1+D1+I2=C 4** **C4 X P1=S4** **Low**	• All waste (domestic, hydrocarbon, hazardous) must be managed in line with the prescribed waste management plan. • Refuse bins with properly secured lids will be placed around site to collect waste for separation, recycling and disposal. Waste (domestic, construction, hazardous) should be recycled as far as possible and sold/given to interested contractors. Recyclable waste should not be stored for excessive periods.	**E1+D1+I2=C4** **C4 X P1=S4** **Low**	Contamination of water resources
25. Impact on surrounding water resources and delineated wetland buffer *This will occur as a result of increase in sediment inputs & turbidity, Alterations of flow volumes and patterns of flows (increased flood peaks), Increased in nutrient inputs and toxic organic contaminants and Alteration of acidity (pH), Inputs of toxic heavy metal contaminants*	**E1+D2+I2=C 5** **C5 X P2=S10** **Medium Negative**	• A proper stormwater management plan must be incorporated, which includes various attenuation ponds that not only diffusely releases flows into the river system, but also assimilates toxicants by means of bioretention. Strict rules must be incorporated to residents regarding the disposal of refuse, dirty water and washing cars within the property. • An action plan must be implemented to react on burst pipes and potential sewerage leaks. • A sewerage system will have to be installed to accommodate the proposed development. Even though leaks and bursts on well-engineered sewerage pipelines are unlikely, an action plan must be set in place for such an event.	**E1+D2+I1=C4** **C4 X P2=S8** **Medium Negative**	Contamination of water resources
Pathogen inputs (i.e. disease-causing organisms)				
26. Access to Improved Housing/ Reduction of Housing Backlogs	**E1+D2+I1=C 4** **C4 X P2=S8** **Medium Positive**	• More ore information with regards to the cost of the transaction and the time it takes to access mortgage, further administrative, policy and legislative processes is required for potential buyers. • Lessons learned by the Transaction Support Centre established in Khayelitsha, Western Cape, as a pilot action-research initiative could be used as enhancement measure	**E2+D2+I3=C7** **C7 X P2=S14** **Positive**	Influx of people
27. Impact on Local Property Values	**E1+D2+I2=C**	• Design the develop in such a way as to blend in with the local environment	**E1+D2+I1=C4**	Sale of property and relocation to other areas

	5 **C5 X P2=S10** **Medium** **Negative**		**C4 X P2=S8** **Medium** **Negative**	
28. Impact on roads and transport services	**E1+D2+I2=C5** **C5 X P2=S10** **Medium** **Negative**	• Access roads and entrances to the site should be carefully planned to limit any intrusion impacts, noise and dust pollution, damage to the road surfaces, as well as to limit any risks of accidents. • Upgrading of local roads (e.g. Cork Avenue and Fleet Street) could be required to accommodate the increased traffic patterns. • Gauteng Department of Human Settlements to liaise with Gauteng Department of Transport to expand the bus service to the site area in order to make public transport to the site more accessible, for especially school-going children • Consider the development of a bus stop and shelter closer to the proposed site that would adhere to road safety standards •	**E1+D2+I1=C4** **C4 X P2=S8** **Medium** **Negative**	Traffic congestion
29. Impact on social infrastructure	**E1+D2+I1=C4** **C4 X P2=S8** **Medium** **Positive**	• The proposed development could include a recreational area for the residents, including a play area for small children. • The public transport system should be extended to reach the proposed development to assist residents and children with regards to ease of travelling, especially at night. Taxi and bus services would thus have to be extended to reach a point in close proximity of the development. • Consider the development of a bus stop and shelter closer to the proposed site that would adhere to road safety standards. • The Gauteng Department of Human Settlement should take note of the possible impact on the existing schools and could assist to address the issue, in cooperation with the Gauteng Department of Education. The Gauteng Dept. of Education could assist in distributing the children among the different schools and attend to the matter of school fees and qualifications in this regard. • Gauteng Department of Human Settlements to liaise with Gauteng Department of Transport to expand the bus service to the site area in order to make public transport to the site more accessible, for especially school-going children • Consider renewable technologies (e.g. eco-toilets, solar energy and rainwater harvesting) in the design of the development to not only reduce pressure on	**E1+D2+I2=C5** **C5 X P2=S10** **Medium** **positive**	Increase in traffic and influx of people

		the over-burdened and ageing municipal network in the local area, but also to reduce the impact on the environment, especially considering other proposed housing developments within the area . This especially relevant if there is there municipal upgrading programme on the cards in the foreseeable future. • The Gauteng Department of Human Settlement and the CoJ need to be involved in the planning and Environmental Impact Assessment Process to determine the need for bulk services or upgrading of existing services in order to pro-actively plan for the proposed development		
30. Impact on community safety	**E1+D2+I2=C5** **C5 X P2=S10** **Medium Negative**	• The development should implement safety and security features as part of the development e.g. access control, security guards patrolling the area, and the placement of security cameras at strategic places. • Lighting as security measure at night should be implemented as part of the development • Sub-letting as part of this development should not be allowed to ensure that the quality of life of the residents in the area remain high. • The local policing services should respond effectively to any criminal activities, but should further focus on street crimes, assaults, and robberies • Facilitate the speedy repair of streetlights between CoJ and residents	**E1+D2+I1=C4** **C4 X P2=S8** **Medium Negative**	Increase in criminal incidents
31. Impact on Urban Transport	**E1+D2+I1=C4** **C4 X P2=S8** **Medium Negative**	• People who work in the local area but travel large distances from other areas in CoJ should also be a priority consideration in the housing allocation process	**E1+D2+I1=C4** **C4 X P2=S8** **Medium Negative**	Traffic congestion
32. Impact on social cohesion and sense of place	**E2+D2+I3=C7** **C7 X P2=S14** **High Negative**	• No mitigation for the loss of land-use and impact on sense of place can be recommended, apart from considering alternative sites within the area for the proposed development. • Should the development continue, building designs should take the character of the area into account and should not detract from the existing sense of place • Designing of walls, roofs and buildings should be done in such a manner to blend in with the natural environment. • Lighting issues should receive the attention it deserves to avoid any light pollution at night but still ensure that safety requirements are met.	**E1+D2+I2=C5** **C5 X P2=S10** **Medium Negative**	Disturbance on sense of place

		• Consultation with the local community on the design of the building as part of CoJ building legislation for rezoning		

NOTE: This alternative of not going ahead with the construction of the Housing Development, will result in no impacts on the biophysical environment, thus the status quo remains. However, the objective of the Rapid Land Release Programme is defeated.

No Go				
Potential impacts:	**Significance rating of impacts (positive or negative):**	**Proposed mitigation:**	**Significance rating of impacts after mitigation:**	**Risk of the impact** and **mitigation not being implemented**
The no-development alternative would entail a situation where the proposed mixed-use development is not implemented. As a result of this, the ongoing housing backlog in Gauteng. Based on the above, the no-go option is therefore not feasible and is not preferred.	Negative	Not Applicable	Not Applicable	Not Applicable
1. Land invasion *Leaving the land unused or undeveloped may also result in potential land invasion as there are already vagrants and informal settlements in the vicinity of the site*	Negative	Not Applicable	Not Applicable	Not Applicable

List any specialist reports that were used to fill in the above tables. Such reports are to be attached in the appropriate Appendix.

Geotechnical Assessment report, please refer to **Appendix G1**
Floral Impact Assessment report, please refer to **Appendix G2**
Terrestrial Fauna & Avifauna Biodiversity Impact Assessment report, please refer to **Appendix G3**
Avifaunal Impact Assessment report, please refer to **Appendix G4**
Water Resource Assessment report, please refer to **Appendix G5**
Heritage Impact Assessment report, please refer to **Appendix G6**
Socio-economic Assessment report, please refer to **Appendix G7**
Traffic Impact report, please refer to **Appendix G8**
Floodline Assessment Report please refer to **Appendix G9**

Describe any gaps in knowledge or assumptions made in the assessment of the environment and the impacts associated with the proposed development.

- The information provided by the applicant is accurate, adequate, and unbiased, and no information that could change the outcome of the BA process has been withheld.
- The information obtained from the specialist studies undertaken for this project is accurate and objective and sufficient for the level of assessment required.
- Environmental assessment studies are limited to scope, time and budget. The proposed mitigation measures are based on reasonable and informed assumptions based on the recommendations of the appointed specialists as well as deductive reasoning.
- Only one site has been considered in this assessment as site selection is subject to Land Availability Stream (LAS), of the Rapid Land Release Programme (RLRP). The Programme mainly aims to identify land parcels that are currently vacant, owned by either the National, Provincial or Local Government and can be allocated to qualifying beneficiaries for the development of human settlements and/or for agricultural purposes.
- The Bryanston 3B site is environmentally sensitive as the property falls within the Ferndale Valley Arboretum. The applicant does not plan to develop the entire site and other properties belonging to the state and the City of Johannesburg that form part of the Ferndale Valley Arboretum will not be developed.
- The Public Participation Process has been undertaken in line with the directions regarding the measures to address, prevent and combat the spread of the COVID-19 relating to the National Environmental Management Permits and Licenses. All protocols have been observed to ensure these regulations are upheld whilst the public is afforded an opportunity to comment and participate in the Basic Assessment Process.

3. IMPACTS THAT MAY RESULT FROM THE DECOMISSIONING AND CLOSURE PHASE

Briefly describe and compare the potential impacts (as appropriate), significance rating of impacts, proposed mitigation and significance rating of impacts after mitigation that are likely to occur as a result of the decommissioning and closure phase for the various alternatives of the proposed development. This must include an assessment of the significance of all impacts.

NOTE: The decommissioning phase would entail the demolishing of the constructed houses. Considering the objective of the Rapid Land Release Programme, it is unlikely that the houses will be decommissioned in the foreseeable future. The houses however require maintenance during the life of its operation, whereby some construction related impacts maybe experienced. The impacts outlined below are more or less related to the demobilization stage of the project where the Contractor has completed the work and the equipment is being taken away from site and closing final issues. However, the closure and decommissioning require a separate EIA process and will be conducted as and when closure is required.

List any specialist reports that were used to fill in the above tables. Such reports are to be attached in the appropriate Appendix.

Geotechnical Assessment report, please refer to **Appendix G1**
Floral Impact Assessment report, please refer to **Appendix G2**
Terrestrial Fauna & Avifauna Biodiversity Impact Assessment report, please refer to **Appendix G3**
Avifaunal Impact Assessment report, please refer to **Appendix G4**
Water Resource Assessment report, please refer to **Appendix G5**
Heritage Impact Assessment report, please refer to Appendix **G6**
Socio-economic Assessment report, please refer to **Appendix G7**
Traffic Impact report, please refer to **Appendix G8**
Floodline Report, please refer to **Appendix G9**

Where applicable indicate the detailed financial provisions for rehabilitation, closure and ongoing post decommissioning management for the negative environmental impacts.

4. CUMULATIVE IMPACTS

Describe potential impacts that, on their own may not be significant, but is significant when added to the impact of other activities or existing impacts in the environment. Substantiate response:

- **Loss of floral habitat -** combined impact of various similar developments in the larger region, which could cumulatively lead to the loss of migratory connectivity and support habitats for CBA areas, as well as further degradation of natural and near-natural remnant Egoli Granite Grassland that may occur in the area.
- **Loss of floral species diversity -** combined impact of various similar developments in the area and may include the cumulative loss of local floral species diversity within the larger region. The disturbance of large areas of natural vegetation in the region may contribute towards increased alien plant species proliferation, as well as bush encroachment into grassland areas.
- **Loss of floral SCC** - A number of floral SCC are known to occur in the larger region and a high number of *Hypoxis hemerocallidea* occur within the study area, with several other provincially protected species, such as orchids and *Scadoxus sp*. also likely to occur. Direct loss, as well as transformation and further loss of habitat within the area, as well as ongoing exposure of floral SCC to over-harvesting may result in such species facing extinction.
- **Destruction of fauna habitat and loss of habitat heterogeneity** - Cumulative loss of ecological nodes along aquatic / ridge corridors and reduction of habitat diversity will cause loss of supporting and satellite habitats and ultimately reduce faunal biodiversity and richness.
- **Disturbance to fauna through noise, vibration, dust and emigration of fauna from site -** The activity on site will result in many species retreating from site, but it is expected that

many resident species will return once the main construction activities have been completed and indigenous gardens are established. Therefore, no significant cumulative impacts are expected.

- Future use of vacant state land.
- The **cumulative impacts of proposed developments located in close proximity** to each other in the Bryanston Ext 3 area. The proposed developments will result in increased traffic and pressure (demand) on existing bulk services. The proposed development could therefore increase the demand and the urgency of the process of improving capacity of services in the area.
- **Attraction of pests and exotic / alien species -** If not properly managed, alien invasive species will out-compete indigenous flora and fauna and reduce overall indigenous biodiversity in the area.
- **Hindrance, trapping, killing of fauna -** No major cumulative impacts expected unless TOP species are impacted.
- **Contamination of fauna habitat through use and storage of hazardous substances, littering and dumping of waste or sewage leaks -** Any additional development will add to the potential of contamination to the area and down-slope areas. Large spills or continuous cumulative leaks and waste dumping that are not cleaned up will enter the environment through run-off and contaminate the environment and poison the fauna.
- **Displacement of Red List species as a result of habitat loss or transformation -** the surrounding area is already heavily transformed as a result of urban and industrial activities, development in this area will further fragment the natural habitat and the species these areas support.
- **Displacement of Red List species as a result of disturbance associated with the construction (noise, blasting, etc)** - There are several sources of existing disturbance in the broader area i.e. road networks and built-up residential. Any additional disturbance associated with the development of the residential area will be significant, especially with regards to African Finfoot.
- **Direct mortality as a result of construction activities** - there are several sources of existing disturbance in the broader area i.e. road networks and built-up residential. Any additional disturbance associated with the development of the residential area will be temporary and if these activities occur outside of the breeding season, the cumulative impact is likely to be of low significance.

5. ENVIRONMENTAL IMPACT STATEMENT

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

Proposal

Two of the sustainable development principles set out in chapter 1 of NEMA State that:
a) Environmental management must place people and their needs at the forefront of its concern, and serve their physical, psychological, developmental, cultural and social interests equitably.
b) Development must be socially, environmentally, and economically sustainable.

The Rapid Land Release Programme seeks to:

- Provide the means to support locally driven housing solutions.
- Contribute to the provision of additional housing stock in dealing with the urgent problem of the housing backlog in the Province.
- Facilitate the release and access to land for the development of housing, and to stimulate social and economic development as well as access to employment opportunities, conservation of the environment, and food security and agricultural production.

The Proposed layout falls in an area of high sensitivity as the site forms part of the conservation area which is regarded as a green belt. This option is located in areas of medium to high sensitivity due to the floral and ecological habitats known to be existing on site within a Class 4 Ridge. Although the proposed/preferred layout does not encroach onto the wetland buffer and is not directly impacting on the riparian areas and surrounding hydrological environment, it is however located in a highly sensitive area from a faunal and floral point of view. Permits to remove some of the species may be required if the development proceeds. This layout however allows for the provision of more houses in line with the mandate and intent of Rapid Land Release Programme, whilst ensuring that the sensitive vegetation along the Bryanston River and wetland is protected. According to the Floral Specialist, Alternative 3 is the more preferred alternative due to its smaller footprint, which will allow some form of conservation of the rocky outcrop and some rocky grassland habitat despite it being located in zone 1 in terms of the GPEMF. Implementation of Alternative 3 will however lead to the direct loss of a greater area of high ecological sensitivity, i.e. a rocky grassland than 'Alternative 1', **and therefore Alternative 1 is considered to be more sustainable and may possibly be preferred over Alternative 3.**

Furthermore, the Preferred Alternative ensures that a 30-meter buffer is maintained (**Figure 21**) to further protect the river, the wetland and its associated riparian vegetation. A significant portion of the site 6,540m² (48%) is retained as open space within the development. This design layout ensures the preservation of woodland habitat within the wetland and riparian zones and avoids the buffer that provides the necessary breeding, roosting and foraging areas to support diversity and density of avifaunal species, particularly to protect the African Finfoot identified in the area. It also has a decreasing population in the region.

Even though the other alternative layouts are similar to the proposal with differences in the terms of the orientation of the parking area and housing units, they each have significant impacts on the riverine vegetation and the wetland. From a floral, faunal, avifaunal, perspective, all three Layouts (Proposal, Alternative 1 and 2) are not ideal because of the high-to medium-high ecological and

biodiversity impacts. All these layouts will transect the existing sensitive environment including the rocky grassland, bouldered rocky outcrop, woodlands, and the modified grassland. These layouts directly encroach into rocky outcrop vegetation and riparian zones resulting in the irreplaceable loss of indigenous vegetation and fauna habitats. The Impact Mitigation Hierarchy provides steps that must be used in mitigating adverse impacts of a project and in turn ensuring environmental protection. There are various levels of preference for mitigation options with the most preferred method and the first step as avoidance and the least and final method as offset. Refer to **Figure 22** for an illustration of the Mitigation Hierarchy.

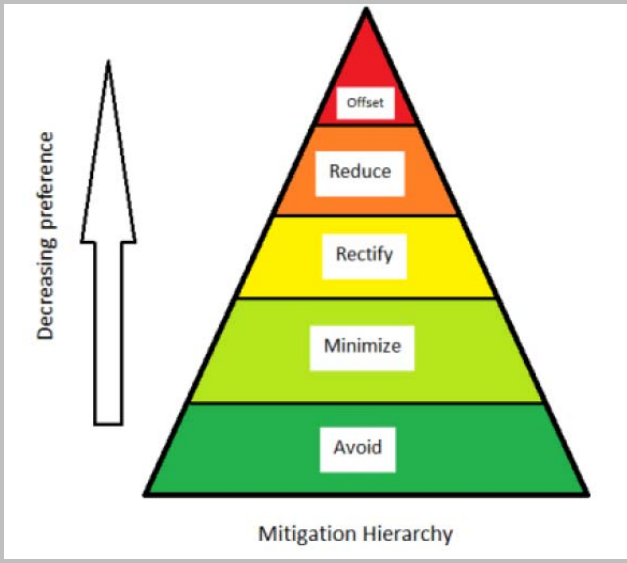


Figure 22: Mitigation hierarchy showing levels of preference (Eco Intelligent, 2016)

In terms of the mitigation hierarchy the following were considered:

Step 1: Avoidance- Although this is the most preferred form of mitigation to avoid adverse environmental impacts this could not be considered as the applicant has a mandate to provide housing and utilise vacant state land. The identified site meets each criteria and must be considered for development.

Step 2: Minimisation- This entails the reduction of adverse environmental impacts through various means as it based on the recognition that environmental impacts cannot be fully avoided in the proposed activity. The Mitigation measures proposed are discussed in Section E (impact Assessment) and included in the Environmental Management Programme attached as **Appendix H.**

Step 3: Rectification- Where an impact has already taken place, rectification entails the implementation of corrective measures to avoid further adverse environmental impacts. Rectification will apply in cases where Contractors or maintenance employees may have erroneously undertaken construction activities outside the development. This does not apply for the Bryanston 3B site, as the site remains intact and relatively undisturbed.

Step 4: Reduction- This is applicable where the above-mentioned rectification is not possible.

Rectification requires new management practices and/or changes in methodology to ensure environmental protection. The proposed alternatives seek to address the lasting environmental impacts of the development and ensure the positive impacts are realised.

Step 5: Environmental Offset- This is meant to cater for the effects of the development through compensation of biodiversity losses by measures such as the establishment of new plants on another area outside the study area where it is not possible to avoid the clearance of vegetation or rehabilitate the disturbed areas. This option was explored but found to be impractical as the required offset land is not available in the urban context and the applicant seeks to utilise available vacant land for the development of housing.

The only layout alternative that differs and has lesser impacts is Alternative 3 particularly with respect to the impacts on the rocky outcrop, this alternative also has its limitations regarding the extent of encroachment into the 30m wetland buffer and the 1:100-year floodline. The outstanding difference lies in the fact that Layout Alternative 3 has preserved the rocky outcrop which is one of the sensitive areas. All the other layouts propose the construction of the houses and associated infrastructure development on the sensitive rocky outcrop area, rocky grasslands, and woodlands.

The proposed development can be predicted to pose negative impacts on the local biodiversity that cannot be adequately mitigated particularly the loss of the rocky outcrops. However, the preferred proposal seeks to conserve the Bryanston River, its wetland and riparian zone and includes a 30-meter buffer to provide increased protection of this area. This in turn preserves the open space green belt along the river and prevents modification to this area in line with the Gauteng Development Guidelines for Ridges. The proposed development will result in significant positive socio-economic impacts that will contribute towards economic growth in line with the mandate of the Rapid Land Release programme.

The development further provides positive socio-economic benefits for people that do not necessarily live in the area but work in the Bryanston area such as:

- Improved housing and an opportunity to own a house through the FLISP Programme.
- Improved quality of life (Less travelling to and from work).
- Improved safety for those that are at risk from criminal activities due to having to travel early and late to get to work.

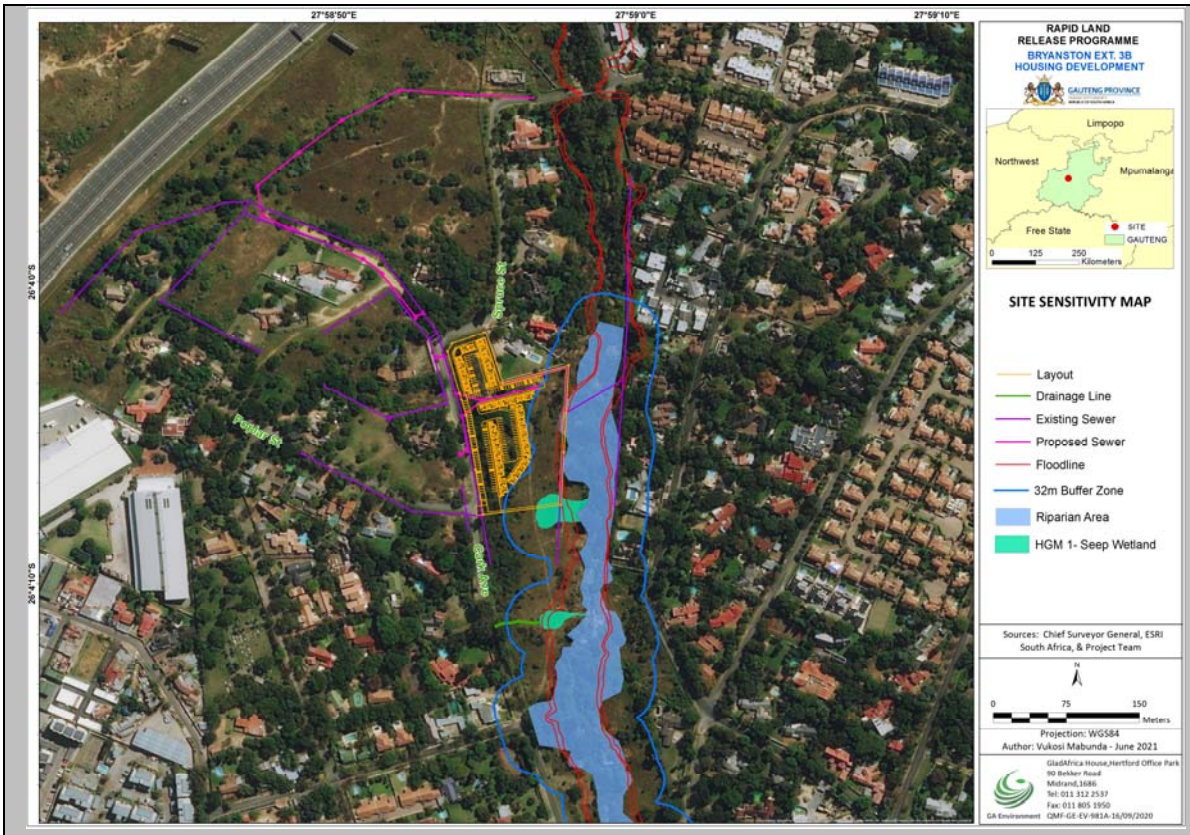


Figure 23: Preferred/Proposed Design layout

It must be noted that they are certain sensitivities on site that are unavoidable by all of the alternatives including the No Go alternative. If the No-go alternative is preferred, this could result in this area being invaded by homeless people in future as this area provides a river front environment which is preferable for land invasions as it provides water for vagrants.

It was also noted that the majority of Interested and affected parties do not support the development due to the perceived negative impacts associated with social housing. It must however be emphasised that the proposed development is to be financed and managed through the Finance Linked Individual Subsidy Programme (FLISP). This is a new product that allows people previously disqualified from owning bonded houses based on income, to qualify for a partly subsidised home. To qualify for the once-off state assisted subsidy, the prospective loanee will be required to qualify for a bond by one of the major financial institutions. The subsidy of between R10,000 up to R87,000, depending on monthly income, is subject to certain qualifying criteria as set out by the Department of Human Settlements.

The issues associated with social housing, such as the reduction in value of existing homes and affordability of beneficiaries have been mitigated by the proposed architectural designs and how the development will be managed. The units will be rented out to gainfully employed, qualifying beneficiaries, based on a criterion that will be determined by GDHS and a company will be responsible for the maintenance of the units. GDHS will establish the necessary institutional arrangements. The collection of rentals is to be managed by a Social Housing Institution who will

manage the building and defaulters will be managed accordingly.

In order to protect biodiversity and conserve sensitive environments during construction, steps that should be followed are to firstly avoid, then minimize, then repair or restore, and finally compensate for, or offset the negative effects of any development on biodiversity (McFarlane, 1993).Thus where the impact is unavoidable, the impacts must be minimised and the unavoidable and unforeseen impacts restored or rehabilitated.

It is the opinion of the EAP that all impacts have been assigned appropriate management measures. The overall impacts of the proposed housing will have high to moderate impacts on the bio-physical environment and some of the impacts can be reduced to a medium to low significance, provided all recommended mitigation are adhered to.

Based on the specialists' findings and the overall assessment of the EAP, it is the EAP's recommendation that the proposed/preferred design layout should be approved subject to implementation of the mitigation measures outlined in this report and the EMPr.

Alternative 1

This site layout is much more similar to the proposal. This layout however impacts on areas of high sensitivity (Rocky grassland), medium high (rocky outcrop) and medium (woodland) and has significantly encroached into the 30m wetland buffer and almost lies fully within the 1 in 100-year floodline. Should the proposed and preferred not be feasible with the Competent Authority's requirements, this alternative can be considered with the application of all mitigation measures detailed in the report.

Alternative 2

Although this site layout will result in the provision of more housing units (247 vs 184). This layout will also have an impact on areas of high sensitivity (Rocky grassland), medium high (rocky outcrop) and medium (woodland). Similar to Alternative 1, the development encroaches into the 30m wetland buffer and lies within the 1 in 100-year floodline and will therefore have a direct impact on the wetland and surrounding watercourses. This alternative can only be considered should the proposal and Alternative 1 not be suitable in line with the Competent Authority's requirements.

Alternative 3

Alternative 3 has excluded the rocky out crop located to the north western portion of the development which is an area of medium to high sensitivity from a flora and fauna perspective. Although this layout preserves the sensitive rocky outcrop that may contain unique habitats and the presence of many species, this layout will result in development east of the site within the 30-meter buffer recommended by the wetland specialist. This layout will also result in the construction of fewer units (97) against a maximum of 247 that is proposed in the other layouts.

This design layout alternative is therefore the least preferred as it will impact on the green belt open space, thereby further modifying the Class IV ridge and resulting in less positive socio - economic benefits.

No-go (compulsory)

The No-Go alternative assumes that the project as proposed does not go ahead. This alternative would result in no environmental impacts on the site or surrounding local area. The no-go development option would also represent a lost opportunity for neighbouring jobseekers who will benefit from temporary and potentially permanent employment opportunities.

In the short term this alternative will benefit the environment, however in the long term this area remains susceptible to land invasions, particularly given its location next to a river which is the preferred type of land for invasions. The land is still land is still zoned residential and unless zoning is changed and the area designated an open space or park, this property will be subject to potential future developments.

6. IMPACT SUMMARY OF THE PROPOSAL OR PREFERRED ALTERNATIVE

PROPOSAL OR PREFERRED ALTERNATIVE											
Impact Description	**Project phase**	**Nature of impact**	**Extent**	**Duration**	**Intensity**	**Probability**	**Reversibility**	**Irreplaceable loss of resources**	**Consequence**	**Significance without mitigation**	**Significance with mitigation**
Socio-economic	Construction	Positive	Regional	Medium Term	High	Highly probable	Short Term	Low	Medium	Medium	High Positive
	Operation	Positive	Regional	Long Term	High	Probable	Irreversible	Low	High	Medium	High Positive
Traffic	Construction	Negative	Regional	Short Term	High	Highly probable	Short Term	Low	Medium	Medium	Low
	Operation	Negative	Regional	Long Term	Medium	Probable	Short Term	Low	Medium	Medium	Low
Noise	Construction	Negative	Local	Short Term	Medium	Probable	Short Term	Low	Medium	Medium	Low
	Operation	Negative	Site	Short Term	Low	Improbable	Short Term	Low	Low	Low	Low
Visual	Construction	Negative	Local	Medium Term	Medium	Probable	Short Term	Low	Medium	Medium	Low
	Operation	Negative	Local	Short Term	Low	Improbable	Short Term	Low	Low	Low	Low
Air quality	Construction	Negative	Local	Short Term	Medium	Probable	Short Term	Medium	Medium	Medium	Low
	Operation	Negative	Local	Short Term	Low	Probable	Short Term	Low	Low	Low	Low
Heritage Resources	Construction	Negative	Site	Short Term	Medium	Probable	Short Term	Low	Low	Medium	Low
	Operation	Negative	Site	Short Term	Low	Improbable	Short Term	Low	Low	Low	No significance

PROPOSAL OR PREFERRED ALTERNATIVE											
Impact Description	**Project phase**	**Nature of impact**	**Extent**	**Duration**	**Intensity**	**Probability**	**Reversibility**	**Irreplaceable loss of resources**	**Consequence**	**Significance without mitigation**	**Significance with mitigation**
Floral species	Construction	Negative	Site	Permanent	Low	Definite	Irreversible	High	High	High	Medium
	Operation	Negative	Site	Permanent	Low	Definite	Irreversible	High	High	High	Low
Faunal	Construction	Negative	Regional	Short Term	Medium	Probable	Short Term	Medium	Medium	Medium	Low
	Operation	Negative	Regional	Short Term	Low	Probable	Short Term	Low	Low	Medium	Low
Avifauna	Construction	Negative	Site	Permanent	Low	Definite	Irreversible	High	High	High	High
	Operation	Negative	Site	Permanent	Low	Definite	Irreversible	High	High	High	High
Surface Water	Construction	Negative	Regional	Short Term	Low	Probable	Short Term	Low	Low	Medium	Low
	Operation	Negative	Regional	Short Term	High	Highly probable	Short Term	Medium	Medium	High	Medium
Groundwater Impacts	Construction	Negative	Regional	Medium Term	Low	Improbable	Short Term	Low	Low	Low	No significance
	Operation	Negative	Regional	Long Term	High	Highly probable	Sort Term	Medium	Medium	High	Medium

7. IMPACT SUMMARY OF ALTERNATIVE 1 & 2

ALTERNATIVE 1 & 2											
Impact Description	**Project phase**	**Nature of impact**	**Extent**	**Duration**	**Intensity**	**Probability**	**Reversibility**	**Irreplaceable loss of resources**	**Consequence**	**Significance without mitigation**	**Significance with mitigation**
Socio-economic	Construction	Positive	Regional	Medium Term	High	Highly probable	Short Term	Low	Medium	Medium	High
	Operation	Positive	Regional	Long Term	High	Probable	Irreversible	Low	High	Medium	High
Traffic	Construction	Negative	Regional	Short Term	High	Highly probable	Short Term	Low	Medium	Medium	Low
	Operation	Negative	Regional	Long Term	Medium	Probable	Short Term	Low	Medium	Medium	Low
Noise	Construction	Negative	Local	Short Term	Medium	Probable	Short Term	Low	Medium	Medium	Low
	Operation	Negative	Site	Short Term	Low	Improbable	Short Term	Low	Low	Low	Low
Visual	Construction	Negative	Local	Medium Term	Medium	Probable	Short Term	Low	Medium	Medium	Low
	Operation	Negative	Local	Short Term	Low	Improbable	Short Term	Low	Low	Low	Low
Air quality	Construction	Negative	Local	Short Term	Medium	Probable	Short Term	Medium	Medium	Medium	Low
	Operation	Negative	Local	Short Term	Low	Probable (if stock farming takes place), Improbable if crop farming takes place)	Short Term	Low	Low	Low	Low

ALTERNATIVE 1 & 2											
Impact Description	**Project phase**	**Nature of impact**	**Extent**	**Duration**	**Intensity**	**Probability**	**Reversibility**	**Irreplaceable loss of resources**	**Consequence**	**Significance without mitigation**	**Significance with mitigation**
Heritage Resources	Construction	Negative	Site	Short Term	Medium	Probable	Short Term	Low	Low	Medium	Low
	Operation	Negative	Site	Short Term	Low	Improbable	Short Term	Low	Low	Low	No significance
Floral species	Construction	Negative	Site	Permanent	Low	Definite	Irreversible	High	High	High	Low
	Operation	Negative	Site	Permanent	Low	Definite	Irreversible	High	High	High	Low
Faunal	Construction	Negative	Regional	Short Term	Medium	Probable	Short Term	Medium	Medium	Medium	Low
	Operation	Negative	Regional	Short Term	Low	Probable	Short Term	Low	Low	Medium	Low
Avifauna	Construction	Negative	Site	Permanent	Low	Definite	Irreversible	High	High	High	High
	Operation	Negative	Site	Permanent	Low	Definite	Irreversible	High	High	High	High
Surface Water	Construction	Negative	Regional	Short Term	Low	Probable	Short Term	Low	Low	Medium	Low
	Operation	Negative	Regional	Short Term	High	Highly probable	Short Term	Medium	Medium	High	Medium
Groundwater Impacts	Construction	Negative	Regional	Medium Term	Low	Improbable	Short Term	Low	Low	Low	No significance
	Operation	Negative	Regional	Long Term	High	Highly probable	Sort Term	Medium	Medium	High	Medium

8. IMPACT SUMMARY OF ALTERNATIVE 3

ALTERNATIVE 3											
Impact Description	**Project phase**	**Nature of impact**	**Extent**	**Duration**	**Intensity**	**Probability**	**Reversibility**	**Irreplaceable loss of resources**	**Consequence**	**Significance without mitigation**	**Significance with mitigation**
Socio-economic	Construction	Positive	Regional	Medium Term	High	Highly probable	Short Term	Low	Medium	Medium	High
	Operation	Positive	Regional	Long Term	High	Probable	Irreversible	Low	High	Medium	High
Traffic	Construction	Negative	Regional	Short Term	High	Highly probable	Short Term	Low	Medium	Medium	Low
	Operation	Negative	Regional	Long Term	Medium	Probable	Short Term	Low	Medium	Medium	Low
Noise	Construction	Negative	Local	Short Term	Medium	Probable	Short Term	Low	Medium	Medium	Low
	Operation	Negative	Site	Short Term	Low	Improbable	Short Term	Low	Low	Low	Low
Visual	Construction	Negative	Local	Medium Term	Medium	Probable	Short Term	Low	Medium	Medium	No significance
	Operation	Negative	Local	Short Term	Low	Improbable	Short Term	Low	Low	Low	Low
Air quality	Construction	Negative	Local	Short Term	Medium	Probable	Short Term	Medium	Medium	Medium	Low
	Operation	Negative	Local	Short Term	Low	Probable (if stock farming takes place), Improbable if crop farming	Short Term	Low	Low	Low	Low

ALTERNATIVE 3											
Impact Description	**Project phase**	**Nature of impact**	**Extent**	**Duration**	**Intensity**	**Probability**	**Reversibility**	**Irreplaceable loss of resources**	**Consequence**	**Significance without mitigation**	**Significance with mitigation**
						takes place)					
Heritage Resources	Construction	Negative	Site	Short Term	Medium	Probable	Short Term	Low	Low	Medium	Low
	Operation	Negative	Site	Short Term	Low	Improbable	Short Term	Low	Low	Low	No significance
Floral species	Construction	Negative	Site	Permanent	Low	Definite	Irreversible	High	High	High	Low
	Operation	Negative	Site	Permanent	Low	Definite	Irreversible	High	High	High	Low
Faunal	Construction	Negative	Regional	Short Term	Medium	Probable	Short Term	Medium	Medium	Medium	Low
	Operation	Negative	Regional	Short Term	Low	Probable	Short Term	Low	Low	Medium	Low
Avifauna	Construction	Negative	Site	Permanent	Low	Definite	Irreversible	High	High	High	High
	Operation	Negative	Site	Permanent	Low	Definite	Irreversible	High	High	High	High
Surface Water	Construction	Negative	Regional	Short Term	Low	Probable	Short Term	Low	Low	Medium	Low
	Operation	Negative	Regional	Short Term	High	Highly probable	Short Term	Medium	Medium	High	Medium
Groundwater Impacts	Construction	Negative	Regional	Medium Term	Low	Improbable	Short Term	Low	Low	Low	No significance
	Operation	Negative	Regional	Long Term	High	Highly probable	Sort Term	Medium	Medium	High	Medium

Having assessed the significance of impacts of the proposal and alternative(s), please provide an overall summary and reasons for selecting the proposal or preferred alternative.

The preferred layout allows for the protection of the Bryanston River, its wetland and riparian zones and the green belt that forms part of a Class IV ridge line. A 30-meter buffer has been included into the design layout to further protect the remaining extent of the Class IV ridge, which has been modified by private developments north and west of the site. The development will tap into existing bulk services and no new infrastructure will be developed in the wetland or the 30-meter buffer area (Refer to **Figure 23**). Stormwater outlets will daylight stormwater outside the buffer zone and all sewerage connections will take place outside the buffer zone. The Buffer area and the remaining extent of the Bryanston River and wetland which constitutes 4,918m² (33%) will be incorporated into the overall open space of the development and managed in terms of the Johannesburg Metropolitan Open Space Policy (JMOSS). The open space within the 30 meter buffer will be carefully managed by the Social Housing Committee and connectivity with the Ferndale Valley Arboretum will be maintained.

The product to be used to finance the development, select beneficiaries and manage the infrastructure and the open space area will be through the Finance Linked Individual Subsidy Programme (FLISP). This is a new product allowing people previously disqualified from owning bonded houses based on income, to qualify for a partly subsidised home. To qualify for the once-off state assisted subsidy, the prospective beneficiary will be required to qualify for a bond from one of the major financial institutions. This product and the design layout will ensure the affordable provision of houses to be constructed in line with the aim of the Rapid Land Release Programme. All layouts including Alternative 1, 2, and 3 seek to optimise development without significantly modifying the environment. It must further be noted that all three Layouts (Proposal, Alternative 1 and 2) have direct impacts of high to medium high on the ecological environment. The preferred/proposal comparatively has lesser overall impacts. However, it must be noted that they are certain sensitivities on site that are unavoidable by either of the alternatives and the proposal has emerged to be the most feasible. The assessment of all alternatives has taken into account vacant land in the area and several planned housing developments in the local area that would cumulatively increase the pressure on social, municipal and transport infrastructure as well as increase the impacts on local community safety substantially.

The proposal has addressed the issues raised by the interested and affected parties as follows:

Table 7: Summary of main issues and Mitigation measures proposed

No	Issues raised	Mitigation
1.	The design of the proposed development does not suit the current architectural designs of houses in the area and that the design will lead to an invasion of privacy for neighboring properties.	The proposed architectural designs and finishes are similar if not better than other developments identified in the area as presented in Section B1 of this report.
2.	The client/applicant should rather consider	The mandate of the applicant is to make

	looking at properties in the Randburg CBD as there are ample buildings which could be revamped for the purposes of housing and the CBD would be more suited.	use of existing vacant state-owned land to provide housing and commercial opportunities for the less fortunate. The identified properties in Bryanston also provide an opportunity for the applicant to facilitate the provision of housing where people work and therefore reduce pressure on public transport, traffic and in turn improve the quality of the lives of the beneficiaries. It is unknown who the buildings in Randburg belong to, but the applicant can only develop on state owned land.
3.	The roads in the area will not be able to accommodate the increased traffic volumes that will be caused by the proposed development and there is insufficient space and no road reserves available to provide the necessary upgrades.	According to the Traffic Impact Assessment Study (**Appendix G8**) the proposed development will generate 93 trips. The access to the development will be stop-controlled off Cork Ave. Parking requirements were calculated by assuming a social/ inclusionary housing development for which the parking rate to be provided is 0,75 bays/d.u. This means that 153 parking bays are required, and 153 parking bays have been provided for. The following recommendations have been made for traffic upgrades and these designs have been submitted to the JRA: • Changing of the West Ave/ North St intersection from a 3-way stop to a 2-way stop intersection. • Signalisation and geometric upgrade of the West Ave/ Rocky St intersection. • Signalisation and geometric upgrade of the Kays Ave/ Jacaranda Ave intersection. • Signalisation and geometric upgrade of the Kays Ave/ Cumberland Ave intersection. • The above two signals to be specifically coordinated as was analysed, with progression provided for the eastbound flow during the a.m.

		peak and the westbound flow during the p.m. peak. These recommendations will address existing traffic issues and will account for the traffic from the development. The JRA recommendations will be included into the overall development to ensure traffic issues are managed. It must also be noted that placing beneficiaries in places where they work has a positive impact on traffic in the entire region.
4.	The studies done did not include the impact of Bryanston A.	The cumulative impact of Bryanston A,B,C and D including the private developments identified in Section B1 have been considered in this impact assessment.
5.	The area is used as a recreational space which will not be able to continue should development take place.	It is noted that the Arboretum is a conservation area that is pristine and provides a recreational space for those that gain access to it through the Bryanfern Homeowners association. It is also noted that it is an area that has been kept natural and forms part of the natural spaces to those that live in the area, drive past it or look at it from the view of their homes. It must however be also noted that other private areas with similar conservation status to the north of this site have been largely developed and this site and areas to the south have largely remained vacant as this land is owned by the state. It must also be noted that according to the Ecological Specialists (Floral, Fauna, Water Resource) this area is natural with indigenous vegetation **however** the integrity of the riparian zone was rated as largely modified due to the extensive encroachment of alien invasive vegetation.

		The site provides suitable, intact habitat for a number of species but **NO** tree species protected under the National Forest Act (Act No. 84 of 1998) or Threatened or Protected Species (TOPS) floral species as provided for in terms of the National Environmental Management: Biodiversity Act (Act No. 10 of 2004) (NEMBA) were encountered within the study area during the field assessment. The Present Ecological State of the system was rated as largely modified (or class D), which was an increase in category to the Klein-Jukskei River, indicating the tributary contributed to habitat and biotic integrity of the catchment. Therefore, the proposed design layout protects the modified riparian zone through a 30 meter buffer and promotes the contiguous green open space belt and preserve the class IV ridge. The proposed development will impact on the western portion of the site which has been modified due to alien invasive species and edge effects from development on the western side of Cork street.
6.	The electricity infrastructure in the area is already under strain and there is a lack of electrical capacity to accommodate further development in the area.	The number of units envisaged in the proposed developments require a total supply of 500 kVA, inclusive of area and street lighting. There is adequate capacity in the existing Eskom network hence no further work is required from Eskom. However, City power as the utility must construct a new underground line from the Olivedale substation to the first minisub at development 3B. The power to the

		walk-units to be fed from the mini sub.
7.	There is a lack of Water and Sewerage Infrastructure capacity in the area to accommodate the proposed development.	Capacity studies have been completed and minimal upgrading is required for the bulk water supply system to provide for all the proposed developments including Bryanston Ext 3B. The Northern WWTW currently has sufficient treatment capacity to accommodate the proposed development and outfalls which will receive sewage flow from the Bryanston Extension 3 development have sufficient capacity in the existing and ultimate scenario. The Bryanston Ext 3 developments will be accommodated in the Kensington B Reservoir zone and the existing bulk system has sufficient capacity to deliver at the required supply rate. Johannesburg water have been presented with the designs and have provided comment on the 24th of November 2020 (**Appendix F**) on bulk water and sewerage infrastructure upgrades which are supported.
8.	The proposed development could increase crime in the area and that there is already not enough policing in the area, with the community having to implement private security.	Although it has been noted that the Construction phase of the development will provide the opportunity to make the area more accessible to criminals due to the high in- and outflow of individuals to the site and surrounding areas specific mitigation measures will be put in place to vet and manage workers. Possible conflict between workers and the resident population resulting in safety risks. The expected inflow of 'out of the area' and 'local' jobseekers; and The management of vending stations where food and small goods are sold in order to manage safety risks. The operation phase will result in similar

			safety measures currently instituted by the Bryanfern Homeowners Association as the beneficiaries and residents of the development would be expected to comply and ensure the safety of their households and those of the local community.

7. SPATIAL DEVELOPMENT TOOLS

Indicate the application of any spatial development tool protocols on the proposed development and the outcome thereof.

The assessment desired land use rights and recommendations of the Town Planner on the project were based on the development policy guidelines in the area. The following spatial development tools were used to effectively plan the development footprint and ensure limited damage to the environments and maintain ecological corridors:

- City of Johannesburg Spatial Development Framework
- Johannesburg Open Space Framework (JOSF)
- Gauteng Conservation Plan (C-Plan Version 3.3)
- South African National Biodiversity Institute (SANBI)

A Geographic Information System (ARCGIS) was utilized to overlay the development footprint and identify opportunities, constraint and areas of biodiversity concern that must be conserved.

8. RECOMMENDATION OF THE PRACTITIONER

Is the information contained in this report and the documentation attached hereto sufficient to make a decision in respect of the activity applied for (in the view of the Environmental Assessment Practitioner as bound by professional ethical standards and the code of conduct of EAPASA).	YES √	NO

If "NO", indicate the aspects that require further assessment before a decision can be made (list the aspects that require further assessment):

Not Applicable

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

- Proposed and Preferred is implemented as a preferred layout alternative from an environmental perspective.
- The preservation of woodland habitat within the wetland riparian zone and the buffer that provides the necessary breeding, roosting and foraging areas for the African Finfoot.
- The draft Environmental Management Programme (EMPr) should form part of the contract with the Contractors appointed to construct and maintain the proposed road.
- A clear and well drafted blasting specification must be prepared in consultation with a blasting specialist. This specification must be included in the Tender document used to appoint the Contractor. The Contractor appointed for the construction of the housing development will ensure that they apply the recommended blasting methodology that has

been determined to have less impact to the site and its surrounding environment.

- The Contractor must ensure compliance with the applicable Covid-19 regulations at the time of construction or any other communicable disease managed at pandemic level.
- A management plan to maintain the ecological integrity of remaining property is required.
- Should the proposed project be approved for development, floral monitoring activities should include bimonthly assessments of the vegetation condition of the Bryanston River bordering the study area to the east, in order to ensure that the proposed project does not adversely affect the riparian and rocky streambank vegetation in this area and the designated 30m buffer zone as per the recommendation of the Wetland Specialist are not encroached by construction activities.
- The watercourse and other area downslope of the project must be checked regularly for erosion during the operational phase of the project and any erosion noted must be treated immediately using soft engineering techniques.
- Construction phase monitoring should include monthly alien and invasive species assessments, including an assessment of eradication and control measures implemented, within the area surrounding the development footprint.
- Biannual alien and invasive species assessments should continue during the operational phase. Where alien and invasive species, specifically those listed under NEMBA as Category 1b invasive species, are noted within grassland areas within the study area and adjacent grasslands further to the south, immediate eradication actions should be undertaken, without disturbance to unaffected vegetation.
- The appointed Contractor and development operations body controls the growth and spread of *Campuloclinium macrocephalum* within the site which poses an immediate threat to indigenous vegetation.
- Annual monitoring of any habitat rehabilitation works undertaken should also take place through determining the relative alien to indigenous plant ratio, the percentage cover, and relative species diversity over the course of the project during which rehabilitation measures are being implemented.
- Should any floral SCC such as *Hypoxis hemerocallidea* be rescued and relocated, the relocation success must be monitored annually during the growing season for a period of three years by visual inspection.
- A faunal monitoring Plan must be compiled to prevent the unnecessary destruction of natural habitat and animal life within the development area and to maintain ecological connectivity to neighbouring sites and, where possible, to regional ecological corridors.
- Open spaces must be maintained within sections of the development footprint to maintain ecological connectivity to the Ferndale Valley Arboretum through palisade fencing or tunnels in walls.
- Registered Ecological Specialists to conduct searched for potential TOP species (specifically scorpions and Baboon Spiders) from the construction areas just before site clearing commences; these can be released into the CBA2 area, in appropriate micro-habitats.
- Applicant obtains a Water Use Authorisation (WUA) for all development activities that will take place within the regulated 500 meter area.
- An attenuation pond must be constructed between the recommended buffer zone and the

proposed development to attenuate stormwater and to assimilate toxicants. A bioretention component must be incorporated into this pond to assist with assimilation of contaminants. Water from this attenuation pond must be diffusely redistributed into the river system to the east; and

- Compile a comprehensive storm-water management plan, as part of the final design of the project and implement during construction and operation.
- An independent Environmental Control Officer (ECO) must be appointed by the project developer prior to the commencement of any authorised activities.
- Monthly monitoring reports must be submitted to GDARD for the evaluation of the project's compliance with the EMPr and Environmental Authorisation.
- All declared alien plants must be identified and managed in accordance with the Conservation of Agricultural Resources Act, 1983 (Act No 43 of 1994), and the implementation of a monitoring programme in this regard is recommended.
- Implementation of intersection and road upgrades recommendations provided by the Traffic Impact Assessment Study.
- Existing tracks/roads should be used as far as possible, and construction activities should be limited to the authorised site.
- Disturbed areas should be rehabilitated as soon as possible once construction is complete in an area.
- The Developer shall ensure that adequate security and employee vetting measures are put in place to minimize the potential risk of crime during the construction and operational phase.
- The developer must obtain all necessary permits prior to the commencement of construction.
- Gautrans must provide comment and approve the development within the PWV3 road reserve
- A public complaints register must be available on site to record any issues of concern from the public regarding the project.
- Continuous Induction and Implementation of environmental awareness education to the contractor's and labourers prior and during to construction
- Continued consultation and engagement with all relevant stakeholders particularly property owners, neighbouring and local communities, and respective municipalities during labour recruitment and procurement for services and supplies during construction phase.
- Should archaeological sites or graves be exposed, in other areas during construction work, it must immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made.
- No "permanent" facilities should be placed within the 1:100-year flood line as per the recommendations of the Floodline Assessment study.

9. THE NEEDS AND DESIREBILITY OF THE PROPOSED DEVELOPMENT

(as per notice 792 of 2012, or the updated version of this guideline)

In Gauteng Province, the GDHS is responsible for the provision of sustainable human settlements for beneficiaries on their list. In addition to housing, the GDHS recognizes the need for the release of land for activities such as agriculture (to ensure food security), and other commercial activities as part of the creation of sustainable human settlements. It is mainly against this background that the GDHS though the RLRP is proposing this housing development in Bryanston as well as other areas within the Province as a step forward in addressing current housing backlog.

In the Gauteng City Region, persistent challenges continue to be encountered in terms of rapid urbanisation and in-migration, thus placing enormous pressure on service delivery and provision of housing. Gauteng is a net positive immigration hub, with more South African residents migrating into the Province as opposed to migrating out. In addition to this, access to land remains a big challenge for Gauteng residents, particularly for purposes of agriculture, human settlements, economic production and industrialisation. This is coupled with the fact that land acquisition has been a persistent constraint on the delivery of human settlements in relation to time spent acquiring land, and the associated costs thereof. The Rapid Land Release Programme (RLRP) if implemented sustainably, will serve to address some of the housing challenges that Gauteng is faced with as the smallest province in South Africa.

The Bill of Rights as set out in Sections 7 to 39 of the Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996) presents aspects that are related to the rights of all persons residing within the boundaries of South Africa. Section 26(1) of the Constitution states that "*everyone has the right to have access to adequate housing*". It is mainly to address this constitutional right that the GDHS is proposing to develop housing in Bryanston Ext. 3B. The economic opportunities available within the Gauteng Province attract a large number of persons from other Provinces of South Africa as well as abroad. The provision for adequate housing is therefore a priority for the GDHS who must ensure that housing is provided for all qualifying beneficiaries.

10. THE PERIOD FOR WHICH THE ENVIRONMENTAL AUTHORISATION IS REQUIRED

(Consider when the activity is expected to be concluded)

The Environmental Authorisation is required for a minimum of 10 years due to the fact that developments of this nature are often implemented in a phased manner, which may last up to several years.

11. ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr)

(must include post construction monitoring requirements and when these will be concluded.)

If the EAP answers “Yes” to Point 7 above, then an EMP is to be attached to this report as an Appendix

EMPr attached	**Appendix H**

SECTION F: APPENDICES

The following appendixes must be attached as appropriate (this list is inclusive, but not exhaustive):

It is required that if more than one item is enclosed that a table of contents is included in the appendix

Appendix A: Site plan(s) – *(must include a scaled layout plan of the proposed activities overlain on the site sensitivities indicating areas to be avoided including buffers)*

Appendix B: Photographs

Appendix C: Facility illustration(s)

App C1 – Architectural Impression
App C2 – Site Development Layouts and sensitivity layouts

Appendix D: Route position information

Appendix E: Public participation information

Appendix 1 – Proof of site notice
Appendix 2 – Written notices issued as required in terms of the regulations
Appendix 3 – Proof of newspaper advertisements
Appendix 4 –Communications to and from interested and affected parties
Appendix 5 – Minutes of any public and/or stakeholder meetings
Appendix 6 - Comments and Responses Report
Appendix 7 –Comments from I&APs on Basic Assessment (BA) Report
Appendix 8 –Comments from I&APs on amendments to the BA Report
Appendix 9 – Copy of the register of I&APs

Appendix F: Water use license(s) authorisation, SAHRA information, service letters from municipalities, water supply information

App F1 - SAHRA Comment
App F2 - Bryanston 3B WULA Submission
App F3 - Outline Scheme Report
App F4 - Service Letters
App F5 - NEMA Query (GDARD)

Appendix G: Specialist reports

App G1 - Geotechnical Report
App G2 - Floral Assessment Report
App G3 - Faunal Assessment Report

App G4 - Avifaunal Assessment Report
App G5 - Water Resource Assessment
App G6 - Heritage Impact Assessment
App G7 - Socio-Economic Impact Assessment
App G8 - Traffic Impact Assessment
App G9 - Floodline Report

Appendix I: Other information

I.1 – EAP's CV
I.2 – DFFE Environmental Screening Report

CHECKLIST

To ensure that all information that the Department needs to be able to process this application, please check that:

- Where requested, supporting documentation has been attached;
- All relevant sections of the form have been completed.