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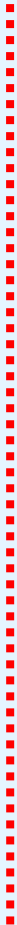
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CLAYVILE X50 SITUATED ON THE REMAINDER OF PORTION 183, PORTION 30 AND PORTION 31 OF THE FARM OLIFANTSFONTEIN 410 J.R GAUT 002/14-15/0098

Draft

Environmental Impact Assessment



Submitted on behalf of:

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Executive Summary

Introduction

LEAP Landscape Architect and Environmental Planner CC was appointed by Valumax Midrand (Pty) Ltd as Independent Environmental Consultant to undertake the appropriate environmental process for the proposed Mixed use development on The Remainder of Portion 183, Portion 30 and Portion 31 of the Farm Olifantsfontein 410 J.R. The process was registered for an EIA (Scoping) process with the Gauteng Department of Agriculture and Rural Development (GDARD) under Regulation 543 to 547 of the National Environmental Management Act (Act No 107 of 1998) and was assigned the reference number **GAUT 002/14-15/0098**.

GENERAL SITE DESCRIPTION

Clayville X50 situated on the Remainder of Portion 183, Portion 30 and Portion 31 of the Farm Olifantsfontein 410 J.R falls under the jurisdiction of the Ekurhuleni Metropolitan Municipality. The site is located approximately 4km east of the N1 highway, 6km south-west of Clayville. Road infrastructure in close proximity to the site includes Van Riebeeck Road to the west and Rainbow Street to the south, while Republic Road, which enters the site at the north-eastern corner, provides an excellent point of access in a north-south direction. The proposed development site has an extent of approximately 163 hectares.

RECEIVING ENVIRONMENT

The Remainder of Portion 183 of the Farm Olifantsfontein, previously formed part of a larger site known as Portion 183 of the Farm Olifantsfontein 410 J.R. Portion 183 of the Farm Olifantsfontein 410 J.R was recently subdivided into the Remainder of Portion 183 of the Farm Olifantsfontein and Portion 207 (a portion of portion 183) of the Farm Olifantsfontein 410 J.R. Both of these properties are under application to be developed under two separate applications. Environmental Impact Assessments are being carried out for both of the aforementioned sites.

However it must be noted that the majority of the studies completed by specialists and other consultants, which are attached to this report, was completed for the entire site (Portion 183 of the Farm Olifantsfontein).

To determine the impact of both proposed projects on the Remainder of Portion 183, Portion 30, Portion 31 and Portion 207 (a portion of portion 183) of the Farm Olifantsfontein, therefore the impacts generated as a result of the two developments will be assessed and addressed in a consolidated manner in order to fully understand the cumulative impacts thereof.

Topography and Hydrology

The site has an approximate average site gradient of 5 – 12 percent.

Natural vegetation consists of veld grasses. There are areas of medium hard rock and hard rock and sub-outcrop in sectors of the site which lies immediately north of the Glen Austin fault belt.

The proposed site falls within the A21B quaternary catchment which is drained by the Hennops River. The study area is the source of two tributaries that flow into the Kaalspruit. To the north, just outside the border of the study area is the source of a tributary of the Olifantsspruit, which is itself a tributary of the Kaalspruit.

A small portion of the Glen Austin Pan is situated along the south wester section of the site. Two tributaries of the Kaalspruit have their source within the proposed site, one draining in a south easterly direction and the other in the central portion of the site, to the east.

Perched seasonal groundwater conditions should be anticipated to develop on horizons of reworked residual granite and ferricrete soil units on the site. The seasonal nature of these shallow groundwater regimes should be recognised.

The groundwater under the site lies in an unconfined aquifer that is the groundwater will be generally contained in a variety of secondary structures within the bedrock such as joints, cracks, fissures and faults. The bedrock in this area (generally) poor yielders of water and would be classed as “minor” aquifers. However any containment liquids entering the bedrock structures are likely to flow comparatively rapidly through the secondary features with hardly any attenuation of pollutants.

Climatic Conditions

Rainfall can be expected throughout the year at an average of approximately 623 mm. The average daily maximum temperature is 28,5°C with the daily minimum at 4,8°C, averaging out to 18°C per day throughout the year. Wind speeds can reach a mean of 8,3km/h. The most intense wind occurs during spring

General Geology

The site is underlain by granite-gneiss bedrock of the Johannesburg-Pretoria granite inlier. The residual soils of these Basement Complex granites are typically silty and clayey sands and sandy silts frequently open-textured and having collapse potential: Sub-angular joint blocks and weathered core-stores are also a common feature in Basement Complex granites.

The surficial colluvial materials contain thin horizons of hardpan ferricrete. Degrees of ferruginisation are also present in the underlying residual silty and clayey sands that originate from decomposition of the granite-gneiss bedrock. Extensive areas of rock sub outcrop, a characteristic of the bedrock underlying the site.

Agriculture

According to the Gauteng Agricultural Potential Atlas (GAPA Version 3), the site of the proposed development is mostly classified as having a moderate agricultural potential.

An Agricultural Potential study was completed by Index

Rainfall can be expected throughout the year at an average of approximately 623 mm. The average daily maximum temperature is 28,5°C with the daily minimum at 4,8°C, averaging out to 18°C per day throughout the year. Wind speeds can reach a mean of 8,3km/h. The most intense wind occurs during spring. This may adversely affect certain crops.

The average yield of boreholes is estimated at 0,5 to 2,0 lt per second. The normal expected borehole yield is not sufficient for irrigated crop production. The total dissolved solids are expected to be between 200 and 600 mg/kg. The levels where crops and animals start being influenced are at 1 200 and 4 000 mg/l respectively.

There is no usable surface water available on the property.

The area is mainly grassland with small portions encroached with black wattle. Most land on the farm is natural or disturbed veld with a grazing capacity of 6 hectares per large stock unit. Taking the quarry and eroded areas into consideration the farm can accommodate approximately 40 LSUs. According NDA criteria, a viable farm should be able to carry at least 60.

The property is underlain by granite and gneiss, a rock that generally weathers into shallow coarse-grained sandy soils. Five soil types were found, (1) deep and moderately deep red soils classified as Hutton, (2) moderately deep yellow and greyish brown colour soils classified as Avalon, (3) shallow greyish brown soils on partially weathered granite, classified as Glenrosa, (4) deep, dark waterlogged soil along the river classified as Longlands and Escourt; and (5) excavations.

A detailed soil and land analysis found that none of the soil types found can be described as high or medium potential.

Agricultural potential assumes that the property would sustain the commercial farmer and that the net farm income is positive. The following were found:

- Most crops fail to yield a positive margin.
- The preferred land use would be livestock, which can provide the farmer with a gross farming income of R143 076 before overheads and repayment of land. This is not sufficient to cover overheads or repay a bond if the land had to be bought. A farming loss of R57 648 is projected if this was a farming unit.

The following conclusions can be made:

- No land is presently under irrigation, there is also no water available.
- The property has only 21 hectare medium to high potential soil. Further, no land was found to be high potential for rainfed cropping according to the departmental guidelines.
- The site is suitable for livestock, but the income that can be derived from the number of cattle that the property can keep, is not high enough to cover overhead costs if the farm was managed as a financial venture.

In conclusion, the property is not a viable farming unit.

Ecology

• Vegetation Assessment

The site is situated in the Bankenveld Veld Type as described by Acocks (1988). Low & Rebelo described the vegetation of the area also as Rocky Highveld Grassland. In the new vegetation map of South Africa (Mucina & Rutherford. 2006) the area falls within the Egoli Granite Grassland.

The area is topographically a uniform, slightly sloped plain, mostly covered with old fields, planted pasture, secondary Anthropogenic grassland and wattle plantations. .

Due to decades of habitation, the natural vegetation was long ago transformed into agricultural fields now replaced by secondary grassland, wattle plantations and sand and granite mining activities.

Other relevant studies in the area include those of Bredenkamp & Brown (2003), Bredenkamp et al. (2006) and Grobler et al. (2006).

The following vegetation units were identified on the site:

1. Old Fields & *Eragrostis* Planted Pasture (low sensitivity)
2. Secondary Anthropogenic *Hyparrhenia* Grassland (low sensitivity)
3. Transformed Secondary Grassland (low sensitivity)
4. Extremely disturbed areas (low sensitivity)
5. Alien Plantations (low sensitivity)
- 6a. Pan Wetland (high sensitivity)
- 6b. *Eragrostis* Wetland Fringe (high sensitivity)
- 6c. *Stoebe* Disturbed Pan Area (high sensitivity)
7. Old Mining Area (low sensitivity)
8. Spruit (high sensitivity)

- The following applies to the proposed site:
- There are no ridges on the site.
- The site does not fall within a conservancy.
- The site does not fall within a protected area.
- The site does fall within a dolomite area.
- There are wetland areas on the site, mainly a pan and man-made quarries, and a small portion of a stream
- There are no sensitive terrestrial areas on the site.

Apart from the pans and the spruit, the entire site is highly disturbed or transformed. It is suggested that the development can be supported, provided that the pans and spruit be protected in green areas within the development plan.

• **Fauna**

The majority of the study area has undergone transformation due to the historic and on-going anthropogenic activities within the study area as well as immediate surroundings. This has led to the reduction of viable faunal habitat for indigenous species, resulting in only species, which have adapted to cohabitate with humans or be tolerant of habitats affected by anthropogenic disturbance presently expected within the study area.

Due to the location of the study area as well as the current habitat conditions no SCC (Species of Conservation Concern) are expected to inhabit the study area. However the presence of the Giant Bullfrogs *Pyxicephalus adspersus* was confirmed. According to the IUCN Red List the Giant bullfrog is listed as least concern. However an amphibian assessment was completed.

• **Amphibian Assessment**

The proposed site includes the habitat for the Giant Bullfrogs *Pyxicephalus adspersus*.

Surrounding land use includes industry to the south, fragmented small holdings to the west open areas to the north and townships on the east.

The assessment completed by VC Management Services assessed the potential impact of the proposed development on amphibians, especially Giant Bullfrogs and made recommendations for the mitigation of the impacts.

The proposed route for the K109 route passes through the site. The impact of the road on the Giant Bullfrog population would be considerable and is also considered.

Giant Bullfrogs require four types of specialized habitat in order to survive, namely breeding sites, burrowing soils, foraging grounds and dispersal corridors. The study site currently provides all four of these habitats.

The proposed development will have the following impacts if no mitigation steps are taken:

- Breeding sites will be disturbed / damaged
- Foraging grounds and burrowing habitats will be reduced
- Road kills and general disturbance will reduce Giant Bullfrog population will be confined to a genetically isolated “island” surrounded by impenetrable development.
- Excavation will damage the perched water table and wetland seepage system.

The impact of the K109 road would be considerable. No mitigating action by the Clayville X50 project will be adequate in the long term if the K109 is authorised in its proposed form. However the road is not part of the Clayville Ext 50 application and the developers are not in a position to implement recommendations made in the Amphibian Assessment regarding the road.

The application for Environmental Authorisation in respect of the K109 road is currently being undertaken by Lokisa Environmental Consulting (Ref: GAUT: 002/14-15/0243).

The K109 road will be 4.9km in length with a reserve of 48.4 metres. The construction involves the upgrading of a portion of Dale Road to K route standards. The rest of the road traverses open ground until it joins Road K127.

The design will be done as a Dual Carriageway though only one carriageway will be constructed. The Gauteng Department of Roads and Transport has not indicated when the other carriageway will be built.

The K109 forms part of the Gauteng Department of Roads and Transport's future road network planning aimed to enhance connectivity within the province and to other provinces. The route alignment for this road is fixed. No location alternative for this development was considered

Culverts at least 500mm high and 500mm wide must be installed underneath roads crossing the biodiversity corridors to serve as migration tunnels for giant bullfrogs and other small faunal species.

Along the K109 where the road crossing the open space area is wide grates allowing light to pass through must be placed in the median between the lanes and culverts to ensure that enough light is provided.

This must be completed in conjunction with an amphibian specialist and the Gauteng Department of Agriculture and Rural Development during the construction phase.

Wetland Assessment

A **Wetland Delineation and Assessment** was completed by *Wetland Consulting Services (Pty) Ltd* in 2009. The aforementioned Wetland Delineation and Assessment was verified by *Limosella Consulting* in 2014. Take note that both wetland delineations were carried out for the original Portion 183 of the Farm Olifantsfontein 410 J.R, which has now been subdivided.

- **Wetland delineation and assessment by Wetland Consulting Services**

The wetlands on site form part of a larger water resource system that drains into both Kaalspruit and Olifantspruit and into the Hennops River.

The PES assessment indicated wetlands that range from largely natural to seriously modified systems (rating B/C to E).

The Gauteng Department of Agriculture and Rural Development (GDARD) requires that wetlands be designated as sensitive habitats as they provide goods and services as well as contributing to biodiversity support that are of value to society.

It is recommended that a 32m buffer be provided surrounding wetlands.

- **Verification of wetland delineation by Limosella Consulting**

Batchelor (2009) describes five wetlands on the site, including a section of Glen Austin Pan which encroaches onto the site. The current assessment found that four of the wetlands remained on site, with approximately the same extent and Present Ecological Status as was recorded in 2009. The easternmost seepage wetland could not be verified since topsoil has been lost and the hard plinthic layer (ferricrete) has been exposed in this area, to such a degree as to remove any remaining wetland indicators (both soil and vegetation). Wetland conditions were however recorded in the center of the site, in the form of seepage water with a rusty brown/oily colour. Various hydrophytic plant species such as sedges were also recorded here. This wetland area was not reflected in Batchelor (2009).

Cultural Heritage

The proposed development site is flat highveld grassland with patches of exotic trees. The site is used for illegal dumping especially near Sebokeng. Near the middle of the site is a natural pan and nearby two Ndebele farm settlements. Both settlements date from the late 1940's and are important from a local heritage point of view.

Except for the two Ndebele farm workers settlements no other important cultural heritage resources or graves have been found on the proposed development site.

The two farm workers settlements are important and should be fully recorded in a Phase II cultural heritage resources impact assessment before an application can be made for demolishing permit.

If during construction any cultural heritage resources or graves are unearthed all work has to be stopped until the site has been inspected and mitigated by a cultural heritage practitioner.

Paleontological Assessment

The impact of the development on fossil heritage is insignificant or zero and therefore mitigation or conservation measures are not necessary for this development. A Phase 1 Palaeontological Assessment will not be recommended. The rocky outcrops, overburden and inter-burden need not be surveyed for fossiliferous outcrops. Special care must be taken during the excavation of foundations, footings and channels, only if the presence of the Transvaal Supergroup is suspected.

Infrastructure and Services

- **Traffic**

Based on the assessment of the existing and planned future road network, traffic counts, a traffic analysis and capacity analysis of road links in the study area, the following concluding remarks are relevant:

Detailed traffic surveys were carried at the following intersections:

- Olifantsfontein Road (R562)/Olifantsfontein Road
- Olifantsfontein Road (R562)/Main Road (Future K111)
- Main Road (Future K111)/Thabana Ntlenyana Drive
- Main Road (Future K111)/Riverside Street
- Main Road (Future K111)/Karee Street
- Dale Road/Archerfish Drive
- Dale Road/Modderfontein Road
- Dale Road/Old Pretoria Road

The proposed development is expected to generate approximately 5061 trips and 5870 trips (in and outbound) during the Weekday AM and PM peak hours respectively on the external road network.

It is proposed that the development be served by two primary accesses off the planned future K109 route. The secondary access to the proposed development is off Main Road (planned future K111 route) and Thabana Ntlenyana Drive. Furthermore a future access is planned 500m north from K111/Thabana Ntlenyana Drive intersection.

From the analysis performed, it was found that the impact of the proposed developments can be mitigated by means of a number of road and intersection improvements.

The 2020 background traffic plus latent rights traffic show that there is an existing capacity constraint. Therefore the developers of the latent rights developments are required to contribute towards roads and intersection upgrades. The upgrading will be as per the requirements of Ekurhuleni Metropolitan Municipality and GDRT.

The 2010 Gauteng Major Road Network shows the planned K109 and K111 provincial roads which are relevant to this development.

The following existing intersections will require improvements:

- Olifantsfontein Road (R562)/Olifantsfontein Road
- Olifantsfontein Road (R562)/Main Road (Future K111)
- Main Road (Future K111)/Thabana Ntlenyana Drive
- Main Road (Future K111)/Riverside Street
- Main Road (Future K111)/Karee Street
- Dale Road/Archerfish Drive
- Dale Road/Modderfontein Road
- The following new intersections external to the development are required:
- Olifantsfontein Road (R562)/K109
- Access Road (R562)/K109
- Access Road (R562)/K109

The road and intersection upgrades will be in accordance with the phasing of the project.

The following are required in terms of Non-Motorised & Public Transport

- It is recommended that K109 be provided with a pair of public transport lay-bys in the form of bus and taxi stops at each access point where access to the township is gained. It is further recommended that the proposed lay-bys be constructed to the appropriate design standards of the relevant roads authority.
- In order to ease and formalise the movement of pedestrians between site accesses and the recommended lay-bys, it is proposed to construct at least 1.5m wide paved (or dust free) sidewalk along at least one side of all roads within the development.

From a traffic engineering perspective, the proposed development is thus regarded as feasible and sustainable and is therefore supported

- **Civil**

- **Water**

A 915mm diameter Klipfontein – Pretoria Rand Water Line RW3508 is situated within the road reserve of Allan Road to the West of the development. Supply to on-site infrastructure was considered by connecting to the abovementioned Rand Water pipeline. Rand Water requires that on-site storage facilities be provided if the peak flow rate exceeds 30% of the average annual daily demand flow rate.

As a result a 20ML ground reservoir, a 2ML Water tower and pump station which will supply the high and low pressure zone areas need to be constructed. A 700mm diameter supply line will be required between the Rand Water line and the new ground reservoir on site, as well as a new 400mm diameter steel connection line to the township

- **Sewer**

The natural topography of the site divides it into three drainage areas

Drainage Area One

Drainage area one (± 52.5 ha) drains to the south where it will connect into a bulk sewer located in the vicinity of the Kaalspruit floodline in Kaalfontein. A 160mm diameter link sewer of 1 100 m in length needs to be constructed and 475m of 250mm diameter need to be upgraded to a 315mm diameter pipeline. The sewer drains into the ERWAT Regional Outfall Sewer which drains into the Olifantsfontein WWTW.

Drainage Area Two and Three

Drainage area two (± 300 ha) slopes towards the east where a 450mm diameter communal link sewer) needs to be constructed which will drain both the Clayville Development and a future Ekurhuleni Housing Development ($\pm 4\ 000$ stands) located to the east. This pipe follows the Kaalspruit flood line at a minimum slope.

Drainage area three drains Extension 50 and (± 50 ha) drains toward the north where a new 250mm diameter link needs to connect area three with the link of area two. A small pump station may be required to transfer the run-off from this area over the watershed into Drainage Area 2.

Pipe 2 and Pipe 3 will connect into the proposed 500mm outfall sewer and a 500mm sewer bridge crossing need to be constructed upstream of the connection into the ERWAT sewer east of the Kaalspruit. The total length of the outfall sewer is approximately 1.5km and the sewer bridge crossing is approximately 80 m in length.

The sewerage will be treated at the Olifantsfontein WWTW which has a total capacity of 105 Mℓ/day. Previously Ekurhuleni Metro Municipality indicated that the treatment works are currently operating at 65 Mℓ/day. ERWAT still needs to confirm that the works has sufficient capacity to accommodate sewer flows generated by the proposed development of 9.2 Mℓ/day.

○ Roads

The design guidelines of Ekurhuleni Metropolitan Municipality, supplemented by the Guidelines for Human Settlement Planning and Design (Red Book) were used to establish the criteria various road classes on relevant road reserve widths. This design will be finalized after the township is approved, inputs from a Traffic Engineer in the form of a Traffic Impact Assessment are provided, and before construction drawings are submitted for approval.

A structural design period of 20 years will be adopted.

● Stormwater management plan

The minor stormwater drainage system is an underground pipe system that will collect stormwater at low points on roads and where justified, before intersections of roads. All commercial, educational, residential 2 & 3 stands will be provided with direct stormwater connections. The major stormwater floods are drained at the low points of the development by the pipe systems designed to accommodate the major flood.

All stormwater is to be collected in attenuation ponds at the low points of the catchments and discharged into the downstream stormwater systems to the south and east of the development.

- **Electrical**

Temporary bulk supply

Currently a Budget Quote has been received from Eskom for a temporary 7MVA supply to service a portion of the first phase of Clayville Ext 45 from their College Substation. According to Eskom there is minimal additional 11kV capacity at the substation however the HV capacity is limited and as a result no additional load can be added to the substation. There are currently no other feasible temporary alternatives.

This supply will expire after 5 years and as a result a permanent bulk supply solution must be found for the entire development.

Permanent Bulk supply

Bulk supply in the area is constrained, however after holding meetings with Eskom they have indicated that a solution could be available as early as the end of 2016 when they envisage their HV network to be repaired, however planning meetings are continually being postponed and as yet there are no set dates which are being worked towards. If their current network is repaired, an upgrade will be required to create sufficient additional capacity on the repaired network. A new substation is required in the area not only to supply the Clayville/Tembisa Mega Project but also the surrounding areas. The developer has received confirmation from the relevant supply authorities that they will be allowed to construct the substation and associated works as a "Self-Build" Project due to Eskom/ Ekurhuleni Metropolitan Municipality's capital constraints. The envisaged end state of the new Ekurhuleni Metropolitan Municipality Clayville substation is 3x30MVA 88/11kV. An approximate total capacity of 55 MVA is required for the entire Clayville/Tembisa Mega Project. This includes approximately 3 MVA excess per extension in order to cater for the unknown number and scale of the urban amenities.

After holding discussions with Eskom there appears to be 2 possible options for bringing sufficient capacity into the area, with each posing a different set of challenges.

Option 1 – Linking into existing Claystep/Clayglass 88kV ring:

Option 2 – Upgrading and repair of existing Lulamisa/Crowthorne 88kV infrastructure.

The Lulamisa-Crowthorne line had to be dismantled (Legal matter) which is one of the ring's ends, the other end being the Lepini-Ivory Park line. Lepini-Ivory Park was already running at 101% under normal conditions before winter.

The entire associated network is operating under an abnormal situation and operational contingency plans are being used to prevent blackouts.

As a result, no immediate work can be done on any part of that network and no additional load can be added. A larger servitude will likely, still be required.

In order for the construction of the substation to proceed, Eskom's network strengthening needs to be completed. No timelines are currently available for either option.

GENERAL PROJECT DESCRIPTION

The proposed project entails the mixed use development to be known as Clayville X50 on Portion 30, Portion 31 and the Remainder of Portion 183 of the Farm Olifantsfontein 410 J.R. This proposed project forms part of a larger development project in the Clayville area known as the Clayville-Tembisa Mega-Housing Project (one of 14 mixed housing development projects invested in by the Gauteng Province and supported by the Premier).

The Clayville-Tembisa Mega-Housing project also includes the proposed Clayville Extensions 71 and 76-80 Townships and the densification of the existing Clayville Extension 45 Township. Together the Clayville-Tembisa Mega-Housing Project will contribute to approximately 14,000 additional stands and units within the Ekurhuleni Metropolitan Municipality – making this one of the priority housing projects for the Metropolitan and the Province at large.

The proposed development will accommodate the informal settlements of Winnie Mandela Park, Madelakufa and Tembisa.

The development proposal in respect of Clayville X50 entails the mix use development is proposed to be zoned as follows:

- Residential 1
- Residential 2
- Residential 4
- Community facility
- Business 2
- Business 3
- Public Services
- Social Services
- Transportation
- Public Open Space
- Special
- Roads

The vision of the Ekurhuleni Metropolitan Municipality is to be The Smart, Creative and Developmental City. Based on the vision the mission statement that was developed for the Ekurhuleni Metropolitan Municipality reads as follows: *Ekurhuleni provides sustainable and people centred development services that are affordable, appropriate and of a high quality. The Ekurhuleni Metropolitan Municipality are focussed on social, environmental and economic regeneration of our city and communities, as guided by the principles of Batho Pele and through the commitment of a motivated and dedicated team.*

The proposed site falls within the Region B, of the Ekurhuleni Metropolitan Municipality's Spatial Development Framework, which is favourably located in the Economic Activity and Employment Area of the Gauteng Province.

Region B can be described as a multi-centred region as it has multiple locations of economic activity (business and industrial) and human settlements. Urban development in Region B is predominantly west of the R21 Freeway, whilst development east of the R21 Freeway is generally agricultural in nature.

This is the north–west region) and it comprises the area which was part of the Khayalami metro. The region is the only area that went through the first and second phases of local government transition and if well supported should develop critical mass on the basis of the economy of the region. This critical mass can be attained and built on the backbone of the industrial developments in Clayville, the proposals for the development of Albertina Sisulu (R21) Corridor, as well as the high income areas of Midstream, Serengeti and Edenvale town as well as the northern areas of Kempton Park. The critical mass should assist in the planning and urban management proposed for focus in Tembisa in terms of the Tembisa Masterplan as pronounced by the Premier in the Gauteng State of the Province address of 2011. The residents of this region also benefit from the developments taking place in the adjoining metros of Johannesburg and Tshwane and alignment is very important.’

The region is in need of developmental support as mentioned in the expert above, the proposed development of the Clayville-Tembisa Mega-Housing Project provides the impetus required for such support. The development will strive to bring together the pockets of development within the region into a coherent whole. This will assist with the sustainability of land development in the region and provide housing stock to the critical masses on the periphery of the Metropolitan.

The proposed development complies with the requirements of the Ekurhuleni Metropolitan Municipality’s RSDF.

RISKS AND KEY ISSUES

Potential risks and impacts include, but are not limited to, the following:

- Biophysical impacts including alteration of fauna and flora habitats, as well as the potential loss of land with limited agricultural potential
- Socio-economic impacts including visual, safety and security, increased traffic and the provision of adequate services and the lack of services in the area

Key issues assessed include:

- Provision of services
- Loss of areas of ecological significance
- Responsiveness to the Ekurhuleni Metropolitan Municipality’s requirements

IMPACTS AND MITIGATION MEASURES

Relevant issues were evaluated in terms of the most important parameters applicable to the environmental management. Several mitigation measures have been identified that could manage the impacts, or mitigate them successfully.

CONCLUSION

The development proposal accommodates and avoids the sensitive areas and in the areas that have been identified as development land, has no fatal flaws in terms of the institutional, bio-physical or socio-economic environments.

RECOMMENDATION

It is recommended that the **Mixed use Clayville X50 development on Portion 30, Portion 31 and the Remainder of Portion 183 of the Farm Olifantsfontein 410 J.R(preferred alternative)** option is utilised. Furthermore, it is recommended that this application be approved, subject to all specifications of:

- The Environmental Impact Assessment Report
- The Environmental Management Plan (EMP)
- All specialist studies
- All requirements of the Ekurhuleni Metropolitan Municipality
- The requirements of the Record of Decision by the Gauteng Department of Agriculture and Rural Development (GDARD)

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1.0 NEMA REQUIREMENTS

In accordance with the Regulations in terms of Chapter 5 of the NEMA, 1998, Section 31 Environmental Impact Assessment Reports require the following:

Environmental impact assessment reports

31.

- (1) *If a competent authority accepts a scoping report and advises the EAP in terms of regulation 30(1)(a) to proceed with the tasks contemplated in the plan of study for environmental impact assessment, the EAP must proceed with those tasks, including the public participation process for environmental impact assessment referred to in regulation 28(h)(i)-(iv) and prepare an environmental impact assessment report in respect of the proposed activity.*
- (2) *An environmental impact assessment report must contain all information that is necessary for the competent authority to consider the application and to reach a decision contemplated in regulation 35, and must include—*
 - (a) *details of—*
 - (i) *the EAP who compiled the report; and*
 - (ii) *the expertise of the EAP to carry out an environmental impact assessment;*
 - (b) *a detailed description of the proposed activity;*
 - I *a description of the property on which the activity is to be undertaken and the location of the activity on the property, or if it is—*
 - (i) *a linear activity, a description of the route of the activity; or*
 - (ii) *an ocean-based activity, the coordinates where the activity is to be undertaken;*
 - (d) *a description of the environment that may be affected by the activity and the manner in which the physical, biological, social, economic and cultural aspects of the environment may be affected by the proposed activity;*
 - I *details of the public participation process conducted in terms of subregulation (1), including—*
 - (i) *steps undertaken in accordance with the plan of study;*
 - (ii) *a list of persons, organisations and organs of state that were registered as interested and affected parties;*
 - (iii) *a summary of comments received from, and a summary of issues raised by registered interested and affected parties, the date of receipt of these comments and the response of the EAP to those comments; and*
 - (iv) *copies of any representations and comments received from registered interested and affected parties;*
 - (f) *a description of the need and desirability of the proposed activity;*
 - (g) *a description of identified potential alternatives to the proposed activity, including advantages and disadvantages that the proposed activity or alternatives may have on the environment and the community that may be affected by the activity;*
 - (h) *an indication of the methodology used in determining the significance of potential environmental impacts;*
 - (i) *a description and comparative assessment of all alternatives identified during the environmental impact assessment process;*
 - (j) *a summary of the findings and recommendations of any specialist report or report on a specialised process;*
 - (k) *a description of all environmental issues that were identified during the environmental impact assessment process, an assessment of the significance of each issue and an indication of the extent to which the issue could be addressed by the adoption of mitigation measures;*
 - (l) *an assessment of each identified potentially significant impact, including—*
 - (i) *cumulative impacts;*
 - (ii) *the nature of the impact;*

- (iii) the extent and duration of the impact;*
 - (iv) the probability of the impact occurring;*
 - (v) the degree to which the impact can be reversed;*
 - (vi) the degree to which the impact may cause irreplaceable loss of resources; and*
 - (vii) the degree to which the impact can be mitigated;*
- (m) a description of any assumptions, uncertainties and gaps in knowledge;*
- (n) a reasoned opinion as to whether the activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation;*
- (o) an environmental impact statement which contains—*
 - (i) a summary of the key findings of the environmental impact assessment; and*
 - (ii) a comparative assessment of the positive and negative implications of the proposed activity and identified alternatives;*
- (p) a draft environmental management programme containing the aspects contemplated in regulation 33;*
- (q) copies of any specialist reports and reports on specialised processes complying with regulation 32;*
- (r) any specific information that may be required by the competent authority; and*
- (s) any other matters required in terms of sections 24(4)(a) and (b) of the Act.*
- (3) The EAP managing the application must provide the competent authority with detailed, written proof of an investigation as required by section 24(4)(b)(i) of the Act and motivation if no reasonable or feasible alternatives, as contemplated in subregulation 31(2)(g), exist.*

2.0 INTRODUCTION

LEAP was appointed by Valumax Midrand (Pty) Ltd as Independent Environmental Consultants to undertake the appropriate environmental process for the proposed Clayville X50 mixed use development on Portion 40 and the Remainder of Portion 9 of the Farm Olifantsfontein 410 J.R Portion 30, Portion 31 and the Remainder of Portion 183 of the Farm Olifantsfontein 410 J.R. The process was registered for an EIA with the Gauteng Department of Agriculture and Rural Development (GDARD) under Regulation 544 & 545 of the National Environmental Management Act (Act No 107 of 1998) and was assigned the reference number **GAUT 002/14-15/0098**.

3.0 OBJECTIVES

The following objectives have been set:

- Preparation of the Environmental Impact Assessment Report by describing the context of the proposed development, including the bio-physical, socio-economic and institutional environments;
- Identification of impacts that the proposed development could have on the bio-physical and social environment;
- Assessment of the attitudes of the surrounding landowners and other interested and affected parties (I&APs) to such a proposed development;
- Recommendation of measures that will reduce, mitigate or eliminate identified negative impacts and improve the positive impacts; and therefore
- Determine whether the proposed development site is deemed suitable for the proposed development from an environmental perspective.

4.0 ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)

The Environmental Assessment Practitioner is Dr. Gwen Theron who is a registered professional member of the following associations:

- SACLAP (South African Council for Landscape Architectural Profession)
- ILASA (Institute of Landscape Architects South Africa)
- IAIA (International Association for Impact Assessments)

Please refer to **Annexure A** – Prof Gwen Theron’s Curriculum Vitae

5.0 LOCATION

The site is located approximately 4km east of the N1 highway, 6km south-west of Clayville, and falls just within the jurisdictional boundaries of the Ekurhuleni Metropolitan Municipality. Road infrastructure in close proximity to the site includes Van Riebeeck Road to the west and Rainbow Street to the south, while Republic Road, which enters the site at the north-eastern corner, provides an excellent point of access in a north-south direction.

The proposed development site has an extent of approximately 163 hectares.

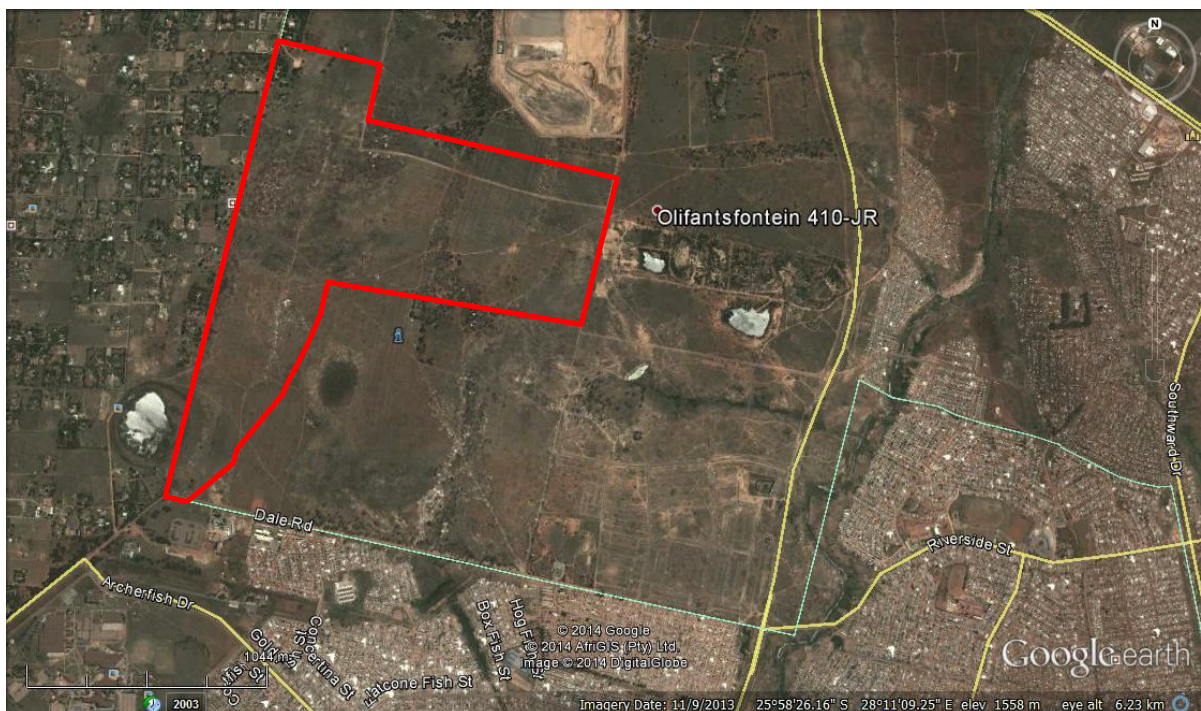


Figure 1: Locality map

6.0 BRIEF DESCRIPTION OF THE PROPOSED DEVELOPMENT

6.1 PROPOSED LAND USES

The development proposal entails the mix use development on Portion 30, Portion 31 and the Remainder of Portion 183 of the Farm Olifantsfontein 410 J.R with a public open space, to be zoned as follows:

- Residential 1

- Residential 2
- Residential 4
- Community facility
- Business 2
- Business 3
- Public Services
- Social Services
- Transportation
- Public Open Space
- Special
- Roads

An application for the establishment of the Clayville Extension 50 Township situated on Portion 30, Portion 31 and the Remaining Extent of Portion 183 of the Farm Olifantsfontein 410 JR is hereby submitted in terms of Section 96 of the Town Planning and Townships Ordinance, 1986 (Ordinance 15 of 1986), as read together with the Spatial Planning and Land Use Management Act, 2013 and the Ekurhuleni Town Planning Scheme, 2014.

This township is proposed to be a Fully Integrated Housing Development with a variety of housing typologies. As a fundamental town planning practice, social amenities and other supporting land uses will be provided to create a sustainable residential development

Table 1: Proposed Land Use Schedule

ZONING	LAND USE	NO OF ERVEN / UNITS	DEVELOPMENT CONTROLS
Residential 1	Dwelling Houses 400m ² (25 du/ha)	5	Density: 25 du/ha; Height: As Per Scheme (2 Storeys); Coverage: As Per Scheme (60%); Parking: As Per Scheme (One Parking Bay Per Erf); Building Lines: 1m on All Sides
Residential 2	Dwelling Houses 160m ² (60 du/ha)	6	Density: 60 du/ha; Height: As Per Scheme (2 Storeys); Coverage: As Per Scheme (60%); Parking: As Per Scheme (One Parking Bay Per Erf); Building Lines: 1m on All Sides
	Dwelling Houses 180m ² (55 du/ha)	6	Density: 55 du/ha; Height: As Per Scheme (2 Storeys); Coverage: As Per Scheme (60%); Parking: As Per Scheme (One Parking Bay Per Erf); Building Lines: 1m on All Sides
	Dwelling Houses 216m ² (45 du/ha)	4	Density: 45 du/ha; Height: As Per Scheme (2 Storeys); Coverage: As Per Scheme (60%); Parking: As Per Scheme (One Parking Bay Per Erf); Building Lines: 1m on All Sides
Residential 4	Dwelling Houses, Dwelling Units, Residential Buildings And Private Roads	13 (2833)	Density: 180 du/ha; Height: 4 Storeys; Coverage: 60%

	(180 du/ha)	Units)	Parking: 0.5 Parking Bays Per Unit; Building Lines: 2m on all sides
Community Facility	Places of Education	1	Height: As Per Scheme (3 Storeys); Coverage: As Per Scheme (50%); Parking: As Per Scheme; Building Lines: As Per Scheme (5m On All Street Boundaries & 3m On All Other Boundaries)
	Places Of Instruction, Places Of Education, Social Halls, Places Of Public Worship, Libraries, Child Care Facilities, Sport And Recreation Clubs, Sports Grounds, Monasteries, Convents	3	Height: As Per Scheme (3 Storeys); Coverage: As Per Scheme (50%); Parking: As Per Scheme; Building Lines: As Per Scheme (5m On All Street Boundaries & 3m On All Other Boundaries)
Business 2	For Business Purposes, Shops, Places Of Public Worship, Places Of Instruction, Places Of Education, Dwelling Units, Residential Buildings, Restaurants, Medical Consulting Rooms, Gymnasium, Plant Nurseries, Service Industries, Parking Bays, Parking Garages	2	Height: As Per Scheme (2 Storeys); Coverage: As Per Scheme (70%); Parking: As Per Scheme; Building Lines: As Per Scheme (3m On Street Boundaries)
Business 3	Offices, Medical Consulting Rooms, Dwelling Houses	2	Height: As Per Scheme (2 Storeys); Coverage: As Per Scheme (70%); Parking: As Per Scheme; Building Lines: As Per Scheme (3m On Street Boundaries)
Public Services	Produce Markets, Abattoirs, Cemeteries, Water Works, Reservoirs, Gas Works, Power/Sub Stations, Mortuaries, Sewage Disposal Works, Waste Disposal Sites, Municipal Purposes, Postal Depots, Telecommunications, Parking, Swimming Pools, Stormwater Retention And Attenuation Ponds	3	As per Scheme
Social Services	Hospitals, Clinics, Libraries, Police Stations, Law Courts, Fire Stations, Municipal & Government Offices, Institutions, Places Of Public Worship, Places Of Instruction, Child Care Facilities, Social Halls, Old Age Home	3	As per Scheme
Transportation	Transport Centers, Taxi Ranks, Parking Bays, Parking Garages	1	As per Scheme
Public Open Space	Parks, Gardens, Botanical Gardens, Zoological Gardens, Conservation Areas, Art Galleries, Sport & Recreation Clubs, Social Halls, Open Spaces, Play Parks, Squares And Buildings Used In Connection Herewith, Municipal Purposes, Sports Grounds, Swimming Pools, Stormwater Retention & Attenuation Ponds.	4	As per Scheme
Special	Electrical Powerlines & Municipal Services	3	As per Scheme
Roads	Streets/Roads, Private Roads, Toll Gates, Weigh Bridges, Parking, Cycle Lanes, Bus Lanes, Municipal Services And Infrastructure		As Per Scheme

There are a number of influencing factors that determined the overall layout configuration and structure of the greater Clayville-Tembisa Mega-Housing Project. The explanation below will focus on Clayville Extension 50. These factors relate to:

- The nine access points to the site. Four accesses on the southernmost road within the township, two accesses on the Proposed K109 and two accesses along the eastern portion of the township and one access on the northern portion of the township.
- The alignment of the proposed K109 through the site.
- The road classifications and associated spacing's
- The linkages with the surrounding areas and the proposed Clayville Ext. 71, 76-80 Townships
- The presence of a wetland and a Dam along the western boundary of the site determines large areas which have been accommodated as "Public Open Space".

Need

The development is initiated with all existing policy guidelines and legal frameworks in mind. The proposed development conforms to the following principles:

- **Urban Integration and Infill**

The project site represents a strategic infill site. This development will serve to enhance the integration of the fragmented urban development between the existing Tembisa Area to the south and east, Glen Austin Agricultural Holdings to the west and Midrand Estates to the north. The development will provide new affordable housing in close proximity to the Midrand CBD through the development of currently under-utilised land.

The development is situated in close proximity to Flint Mazibuko Street which forms part of Phase 1 of the IRPTN. The development is also situated in close proximity the Gautrain's Midrand Station. Additionally, the site can be classified as a strategic Greenfield Development. Being a Greenfield development, the application aims to create a planned community on previously undeveloped land. Unlike urban sprawl, where there is little or no proper suburban planning, this Greenfield development is about efficient urban planning that aims to provide practical, affordable and sustainable living spaces for the growing urban population. This development takes future growth and development into account as well as seeks to avoid the various infrastructure issues that plague existing urban areas and surrounding townships such as Tembisa.

Moving forward with this Greenfield development well within the urban edge, is far more convenient than attempting to develop or modify existing urban areas. The process of revitalizing old or rundown neighbourhoods, can be expensive, slow, and fraught with various social and political issues. The Greenfield process can be a comparatively faster and easier process, with no previous issues to contend with.

- **Coherent Planning**

The effective and coherent planning of sub-regions has always been disrupted by the presence of pockets of development cut off from each other by means of major infrastructure or physical elements. The proposed development which is an affordable housing development would start to integrate the various development pockets into a coherent whole by link roads and by filling in the vacant land. The surrounding roads as well as proposed Provincial Roads are accommodated and continued in the layout plan and will provide access to this development and surrounding townships. The development is

therefore imperative in firstly integrating pockets of development and secondly making use of existing bulk infrastructure and services. The layout plan makes the necessary linkages to integrate the sub-area.

- **Establishment of a Sustainable Living Environment**

The developer will strive to establish a sustainable living environment for the inhabitants of Clayville Extension 50 by providing local social supportive facilities. The development forms part of a larger development area with supportive land uses such as a Primary School, Secondary School, Community Facilities and Parks.

- **Economic Upliftment**

A project like this will create positive spin-offs in terms of job creation for at least the construction period of the project. This economic opportunity must also be structured in such a way that it can establish long-term sustainable economic growth both in terms of skilled and unskilled labour and further in terms of the establishment of permanent business and economic growth opportunities in the area. The proposed development is situated immediately east of the Midrand CBD and close to various business and industrial nodes providing the area with access to places of employment.

- **Focused Public Investment**

The Gauteng Spatial Development Framework (GSDF) limits development to areas located within a provincial urban edge. This development area falls within this urban edge and is considered a strategic infill opportunity to focus investment in an accountable and suitable manner. The site is situated adjacent to the Midrand CBD and falls within an area identified for infill residential densification in the MSDP for Ekurhuleni.

- **Optimisation of Bulk Infrastructure**

The project will enhance infrastructure utilisation and it will contribute to speeding up construction of the proposed provincial road infrastructure. Clayville Extension 50 is located adjacent to established townships, such as the Kaalfontein Extensions, providing bulk services in close proximity to the proposed township border.

- **Environmental Sustainability**

The identified development area has certain environmental qualities and the proposed planning framework recognises these qualities and accommodates all these areas of environmental sensitivity in Public Open Space i.e. the Wetland. Through sensitive planning, the identified natural features were accommodated into public open space to the benefit of the community. After all physical factors and practical considerations were taken into account the layout plan for Clayville Extension 50 was drafted to accommodate the natural features.

The benefits of an Open Space Network are far and wide reaching. Green spaces in urban areas provide substantial environmental benefits. Trees reduce air pollution and water pollution, they help keep

neighbourhoods cooler, and they are a more effective and less expensive way to manage stormwater runoff than building systems of concrete sewers and drainage ditches.

The parks will also produce important social and community development benefits. They will make the neighbourhoods liveable; they offer recreational opportunities for youth, children, and families; and they will provide places in neighbourhoods where people can feel a sense of community.

Access to public parks and recreational facilities has been strongly linked to reductions in crime and in particular to reduced juvenile delinquency. Community gardens increase residents' sense of community ownership and stewardship, provide a focus for neighbourhood activities, expose youth to nature, connect people from diverse cultures, reduce crime by cleaning up vacant lots, and build community leaders

- **Housing need**

It is hereby stated that there is a qualified need to address regional housing issues in the sub-region. The site on which the proposed township will be located is to the east of the Midrand Metropolitan Node and west of the R21 (Albertina Sisulu) Development Corridor.

The growing gap between income and the cost of housing does not affect only lower income households but also households with middle-range incomes whom struggle to find affordable housing.

There are a growing number of South African households that are willing and able to buy or rent a non-subsidized house. However, many of these families simply have nowhere to go as there is little suitable housing stock made available to them in good localities. Many of these families resort to subsidized housing as an alternative residential option thereby creating a shortage of subsidized housing supply. A need exists to create affordable housing for middle income households who are willing to purchase or rent non-subsidized housing and thereby participate in financed and bonded housing.

The proposed Clayville-Tembisa Mega-Housing Project proposes to address the need to initiate an Upward Mobility Trend through "Gap Housing". "Gap Housing" addresses the gap between what middle income families earn and the affordability of housing.

"Gap Housing" is therefore aimed at widening the availability of housing stock for the lower income families. This proposed development commits itself to providing the "gap housing"— so named because it addresses the gap between what middle income families earn and what houses they can afford. This will be achieved by bridging the gap between the high and low income housing types.

- **Economic empowerment**

In the process of bridging the gap between high and low income areas, it is essential to ensure that employment opportunities are available to the poor in order for them to be able to improve their economic status and partake in financial growth.

These employment opportunities should be located in close proximity to these lower income communities. In this case Clayville Extension 50 is situated in close proximity to the Clayville Industrial Node (within 5 minute driving distance) and the Midrand Metropolitan Node (within 15 minute driving

distance). The relatively short driving/travelling distances to these areas of economic opportunity make this location suitable for a residential township.

These employment opportunities can benefit the residents of this proposed development. The development will also link the existing housing developments of Estates and Townhouses to the west of the development and the formalization of households to the east of the development. The development will close the gap between these two areas. Economically, this development will also bring new business opportunities in the area.

- **Variety of Housing Typologies**

The proposed development will consist of bonded and rental housing with supportive land uses in order to make it a sustainable and integrated development. Through the formulation of the layout plan, provision was made for various housing typologies and densities to provide for interest and variety. The housing typology varies in that a variety of stand and unit sizes will be available. The value/cost of the houses constructed is linked to stand/unit sizes.

The Clayville-Tembisa Mega-Housing Project of which Clayville X50 is a part of is a development that aims to promote a high quality, residential and mixed-use environment supported with public amenities. As such it could be argued that the proposed development will act as a key structuring feature in the sub-region because it will encourage a range of housing options to meet different and changing needs of households in the area. The proposed development promotes mixed-uses by allowing appropriate services, supportive uses and social amenities to be intermingled with residential development.

- **Better Utilization of Land**

The application is made to ensure the optimum utilization of the site without defeating any of the primary considerations in respect of environmental issues, compatibility, health, safety, orderliness, economics and the wellbeing of all persons and instances.

It is the intention of the Developer to realize the development potential of the property by establishing a high density, mixed income and mixed land use development in Clayville, which is strategically located between the N1 to the west and the R21 to the east. The proposed development will consist of an integrated, multifunctional neighbourhood offering residential, business, community and recreational facilities.

- **Impact on Surrounding Properties**

The provision of new tenure options and housing typologies would generally enhance the area and accommodate a wide range of residents and income groups. The proposed development will protect the area from further land invasion thus having a lesser potential impact.

See **Annexure N** for Town planning motivation

6.2 LAYOUT

The layout of the proposed development is indicated on **Figure 2: Proposed layout**. However, to fully understand the layout it is important to review the remainder of the report specifically the environmental factors, and the town planning components. Also see **Annexure O** for A1 copy of layout plan



7.0 NEMA LISTED ACTIVITIES TO BE APPLIED FOR

In April 2006 the Minister of Environmental Affairs and Tourism passed Environmental Impact Assessment Regulations in terms of Chapter 5 of the National Environmental Management Act, 1998 (NEMA). The regulations replaced the Environmental Impact Assessment (EIA) regulations which were promulgated in terms of the Environment Conservation Act, 1989 in 1997. The most recent regulations came into place on 18 June 2010 and, therefore, all application must be made in terms of these NEMA regulations. The purpose of this process is to determine the possible negative and positive impacts of the proposed development on the surrounding environment and to provide measures for the mitigation of negative impacts and to maximise positive impacts.

Notice No. R 543 to R 547, specifically 544, 545 and 546 list activities that must be considered in the process to be followed. The Activities listed in Notice No. R 545 and 546 requires that the Scoping and EIA process be followed. However, the draft guidelines document supplied by DEAT states that if any activity being applied for is made up of more than one listed activity and the scoping and EIA process is required for one or more of these activities, the full EIA process must be followed for the whole application.

The proposed development includes a number of listed activities and therefore it will be necessary to follow a full EIA process (as an independent process) in terms of NEMA. The applicant is therefore applying for the following listed activities. Note the sections of the listed activities that are applicable to the proposed development have been marked as bold

Table 2: Listed Activities to be applied for

Regulations	Activity No (s)	Description
GN Reg 544 18 June 2010	9	<p><i>The construction of facilities or infrastructure exceeding 1000 metres in length for the bulk transportation of water, sewage or storm water -</i> <i>(i) with an internal diameter of 0,36 metres or more; or</i> <i>(ii) with a peak throughput of 120 litres per second or more,</i> <i>excluding where:</i></p> <p>a. <i>such facilities or infrastructure are for bulk transportation of water, sewage or storm water or storm water drainage inside a road reserve; or</i></p> <p>b. <i>where such construction will occur within urban areas but further than 32 metres from a watercourse, measured from the edge of the watercourse.</i></p> <p>This activity is applicable in respect of the installation of external and internal services with regards of the proposed development as discussed in section 12.2 of this report as well as the Civil Services report attached hereto under Annexure J.</p>
GN Reg 544 18 June 2012	10	<p><i>The construction of facilities or infrastructure for the transmission and distribution of electricity -</i> <i>(i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts; or</i> <i>(ii) inside urban areas or industrial complexes with a capacity of 275 kilovolts or more.</i></p>

		<p>This activity is applicable in respect of the installation of required substations and powerlines to provide the proposed development with electricity. Refer to section 12.3 of this report as well as Annexure L attached hereto.</p>
<p>GN Reg 544 18 June 2010</p>	11	<p>The construction of:</p> <ul style="list-style-type: none"> (i) canals; (ii) channels; (iii) bridges; (iv) dams; (v) weirs; (vi) bulk storm water outlet structures; (vii) marinas; (viii) jetties exceeding 50 square metres in size; (ix) slipways exceeding 50 square metres in size; (x) buildings exceeding 50 square metres in size; or (xi) infrastructure or structures covering 50 square metres or more <p>where such construction occurs within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line.</p> <p>This activity is applicable in respect of the installation of external and internal services infrastructure including stormwater infrastructure with regards of the proposed development as discussed in section 12.2 of this report as well as the Civil Services report attached hereto under Annexure J&K.</p>
<p>GN Reg 544 18 June 2010</p>	18	<p>The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock from</p> <ul style="list-style-type: none"> (i) a watercourse; (ii) the sea; (iii) the seashore; (iv) the littoral active zone, an estuary or a distance of 100 metres inland of the high-water mark of the sea or an estuary, whichever distance is the greater- <p><i>but excluding where such infilling, depositing, dredging, excavation, removal or moving;</i></p> <ul style="list-style-type: none"> (a) <i>is for maintenance purposes undertaken in accordance with a management plan agreed to by the relevant environmental authority; or</i> (b) <i>occurs behind the development setback line.</i> <p>[Corrected by "Correction Notice 2" of 10 December 2010, GN No. R. 1159]</p> <p>This activity is applicable in respect of the installation of external and internal services infrastructure including stormwater infrastructure with regards of the proposed development as discussed in section 12.2 of this report as well as the Civil Services report attached hereto under Annexure J&K.</p>
<p>GN Reg 544 18 June</p>	22	<p>The construction of a road, outside urban areas,</p> <ul style="list-style-type: none"> (i) with a reserve wider than 13,5 meters or, (ii) where no reserve exists where the road is wider than 8 metres, or (iii) for which an environmental authorisation was obtained for the route

2010		<p><i>determination in terms of activity 5 in Government Notice 387 of 2006 or activity 18 in Notice June of 2010.</i></p> <p>This activity is applicable in respect of the construction of internal roads in respect of the proposed development as well as proposed road upgrades as identified as part of the Traffic Impact Assessment completed for the proposed development.</p> <p>Refer To Section 12.1 below as well as Annexure I attached hereto and Section 12.2 below and Annexure J attached hereto.</p>
GN Reg 544 18 June 2010	37	<p><i>The expansion of facilities or infrastructure for the bulk transportation of water, sewage or storm water where:</i></p> <p><i>(a) the facility or infrastructure is expanded by more than 1000 metres in length; or</i></p> <p><i>(b) where the throughput capacity of the facility or infrastructure will be increased by 10% or more–</i></p> <p><i>excluding where such expansion:</i></p> <p><i>(i) relates to transportation of water, sewage or storm water within a road reserve; or</i></p> <p><i>(ii) where such expansion will occur within urban areas but further than 32 metres from a watercourse, measured from the edge of the watercourse.</i></p> <p>This activity is applicable in respect of the upgrade of external services with regards of the proposed development as discussed in section 12.2 of this report as well as the Civil Services report attached hereto under Annexure J.</p>
GN Reg 544 18 June 2010	38	<p>The expansion of facilities for the transmission and distribution of electricity where the expanded capacity will exceed 275 kilovolts and the development footprint will increase.</p> <p>This activity is applicable in respect of the upgrade of existing substations, etc. to provide the proposed development with electricity.</p> <p>Refer to section 12.3 of this report as well as Annexure L attached hereto.</p>
GN Reg 544 18 June 2010	39	<p><i>The expansion of</i></p> <p><i>(i) canals;</i></p> <p><i>(ii) channels;</i></p> <p><i>(iii) bridges</i></p> <p><i>(iv) weirs;</i></p> <p><i>(v) bulk storm water outlet structures;</i></p> <p><i>(vi) marinas;</i></p> <p><i>within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, where such expansion will result in an increased development footprint but excluding where such expansion will occur behind the development setback line.</i></p> <p>This activity is applicable in respect of the installation of external and internal services infrastructure including stormwater infrastructure with regards of the proposed development as discussed in section 12.2 of this report as well as the Civil Services report attached hereto under Annexure J&K.</p>

GN Reg 544 18 June 2010	47	<p><i>The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre -</i></p> <p><i>(i) where the existing reserve is wider than 13,5 meters; or</i></p> <p><i>(ii) where no reserve exists, where the existing road is wider than 8 metres</i></p> <p>–</p> <p><i>excluding widening or lengthening occurring inside urban areas.</i></p> <p>This activity is applicable in respect of the construction of internal roads in respect of the proposed development as well as proposed road upgrades as identified as part of the Traffic Impact Assessment completed for the proposed development.</p> <p>Refer To Section 12.1 below as well as Annexure I attached hereto and Section 12.2 below and Annexure J attached hereto.</p>
GN Reg 545 18 June 2010	15	<p><i>Physical alteration of undeveloped, vacant or derelict land for residential, retail, commercial, recreational, industrial or institutional use where the total area to be transformed is 20 hectares or more;</i></p> <p><i>except where such physical alteration takes place for:</i></p> <p><i>(i) linear development activities; or</i></p> <p><i>(ii) agriculture or afforestation where activity 16 in this Schedule will apply.</i></p> <p>The proposed site measures approximately 163 hectares in extent. The development proposal entails the mix use development to be known as Clayville X50 on Portion 30, Portion 31 and the Remainder of Portion 183 of the Farm Olifantsfontein 410 J.R with a public open space.</p> <p>Refer to Section 6.1 above as well as Annexure N & O attached hereto.</p>
GNR 546, 18 June 2010	4	<p><i>The construction of a road wider than 4 metres with a reserve less than 13,5 metres.</i></p> <p><i>(a) In Gauteng:</i></p> <p><i>i. A protected area identified in terms of NEMPAA, excluding conservancies;</i></p> <p><i>ii. National Protected Area Expansion Strategy Focus areas;</i></p> <p><i>iii. Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;</i></p> <p><i>iv. Sites identified in terms of the Ramsar Convention;</i></p> <p><i>v. Sites identified as irreplaceable or important in the Gauteng Conservation plan;</i></p> <p><i>vi. Areas larger than 2 hectares zoned for use as public open space;</i></p> <p><i>vii. Areas zoned for a conservation purpose.</i></p> <p><i>viii. Any declared protected area including Municipal or Provincial Nature Reserves as contemplated by the Environment Conservation Act, 1989 (Act No. 73 of 1989) and the Nature Conservation Ordinance (Ordinance 12 of 1983);</i></p> <p><i>ix. Any site identified as land with high agricultural potential located within the Agricultural Hubs or Important Agricultural Sites identified in terms of the</i></p>

		<p><i>Gauteng Agricultural Potential Atlas, 2006.</i></p> <p>This activity is applicable in respect of the construction of internal roads in respect of the proposed development as well as proposed road upgrades as identified as part of the Traffic Impact Assessment completed for the proposed development.</p> <p>Refer To Section 12.1 below as well as Annexure G attached hereto and Section 12.2 below and Annexure I attached hereto.</p>
GNR 546, 18 June 2010	12	<p><i>The clearance of an area of 300 square metres or more of vegetation where 75% or more of the vegetative cover constitutes indigenous vegetation.</i></p> <p>(a) <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;</i></p> <p>(b) <i>Within critical biodiversity areas identified in bioregional plans;</i></p> <p>(c) <i>Within the littoral active zone or 100 metres inland from high water mark of the sea or an estuary, whichever distance is the greater, excluding where such removal will occur behind the development setback line on erven in urban areas.</i></p> <p>The proposed site measures approximately 163 hectares in extent. The development proposal entails the mix use development to be known as Clayville X50 on Portion 30, Portion 31 and the Remainder of Portion 183 of the Farm Olifantsfontein 410 J.R with a public open space.</p> <p>Refer to Section 6.1 above as well as Annexure N & O attached hereto.</p>
GNR 546, 18 June 2010	13	<p><i>The clearance of an area of 1 hectare or more of vegetation where 75% or more of the vegetative cover constitutes indigenous vegetation, except where such removal of vegetation is required for:</i></p> <p>(1) <i>the undertaking of a process or activity included in the list of waste management activities published in terms of section 19 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008), in which case the activity is regarded to be excluded from this list.</i></p> <p>(2) <i>the undertaking of a linear activity falling below the thresholds mentioned in Listing Notice 1 in terms of GN No. 544 of 2010.</i></p> <p>(a) <i>Critical biodiversity areas and ecological support areas as identified in systematic biodiversity plans adopted by the competent authority.</i></p> <p>(b) <i>National Protected Area Expansion Strategy Focus areas.</i></p> <p>(c) <i>In Gauteng:</i></p> <ol style="list-style-type: none"> i. <i>A protected area identified in terms of NEMPAA, excluding conservancies;</i> ii. <i>National Protected Area Expansion Strategy Focus areas;</i> iii. <i>Any declared protected area including Municipal or Provincial Nature Reserves as contemplated by the Environment Conservation Act, 1989 (Act No. 73 of 1989), the Nature Conservation Ordinance (Ordinance 12 of 1983);</i> (v) <i>Sensitive areas as identified in an environmental management framework</i>

		<p><i>as contemplated in chapter 5 of the Act and as adopted by the competent authority;</i></p> <p>iv. <i>Sites or areas identified in terms of an International Convention;</i></p> <p>v. Sites identified as irreplaceable or important in the Gauteng Conservation Plan.</p> <p>The proposed site measures approximately 163 hectares in extent. The development proposal entails the mix use development to be known as Clayville X50 on Portion 30, Portion 31 and the Remainder of Portion 183 of the Farm Olifantsfontein 410 J.R with a public open space.</p> <p>Refer to Section 6.1 above as well as Annexure N & O attached hereto..</p>
GNR 546, 18 June 2010	16	<p>The construction of:</p> <p>(i) <i>jetties exceeding 10 square metres in size;</i></p> <p>(ii) <i>slipways exceeding 10 square metres in size;</i></p> <p>(iii) <i>buildings with a footprint exceeding 10 square metres in size; or</i></p> <p>(iv) infrastructure covering 10 square metres or more <i>where such construction occurs within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line.</i></p> <p>(a) In Gauteng:</p> <p>i. <i>A protected area identified in terms of NEMPAA, excluding conservancies;</i></p> <p>ii. <i>National Protected Area Expansion Strategy Focus areas;</i></p> <p>iii. <i>Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;</i></p> <p>iv. <i>Sites or areas identified in terms of an International Convention;</i></p> <p>v. Sites identified as irreplaceable or important in the Gauteng Conservation Plan;</p> <p>vi. <i>Any declared protected area including Municipal or Provincial Nature Reserves as contemplated by the Environment Conservation Act, 1989 (Act No. 73 of 1989) and the Nature Conservation Ordinance (Ordinance 12 of 1983);</i></p> <p>vii. <i>Areas zoned for a conservation purpose.</i></p> <p>This activity is applicable in respect of the installation of external and internal services infrastructure including stormwater infrastructure with regards of the proposed development as discussed in section 12.2 of this report as well as the Civil Services report attached hereto under Annexure J&K.</p>
GNR 546, 18 June 2010	19	<p>The widening of a road by more than 4 metres, or the lengthening of a road by more than 1 kilometre.</p> <p>(a) In Gauteng:</p> <p>i. <i>A protected area identified in terms of NEMPAA, excluding conservancies;</i></p> <p>ii. <i>National Protected Area Expansion Strategy Focus areas;</i></p>

	<p>iii. Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;</p> <p>iv. Sites or areas identified in terms of an International Convention;</p> <p>v. Any site identified as land with high agricultural potential located within the Agricultural Hubs or Important Agricultural Sites identified in terms of the Gauteng Agricultural Potential Atlas, 2006;</p> <p>vi. All sites identified as irreplaceable or important in terms of the applicable Gauteng Conservation Plan;</p> <p>vii. Any declared protected area including Municipal or Provincial Nature Reserves as contemplated by the Environment Conservation Act, 1989 (Act No. 73 of 1989), the Nature Conservation Ordinance (Ordinance 12 of 1983) and the NEMPAA.</p> <p>This activity is applicable in respect of the construction of internal roads in respect of the proposed development as well as proposed road upgrades as identified as part of the Traffic Impact Assessment completed for the proposed development.</p> <p>Refer To Section 12.1 below as well as Annexure I attached hereto and Section 12.2 below and Annexure J attached hereto.</p>
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8.0 DESCRIPTION OF THE INSTITUTIONAL ENVIRONMENT

The land development proposal of the proposed development site is influenced by the varying scales of institutional environments. The institutional context that is considered and reflected upon ranges from that of international, national, provincial and local / municipal, while each institutional arena as it decreases in scale, requires development planning that is more detailed and responsive to the proposed development site and the surrounding environment.

The following institutional framework documents are relevant to the proposed township and development site.

8.1 INTERNATIONAL CONTEXT

Relevant International Conventions to which South Africa is part of and which should influence the proposed site development:

Table 3: International context

CONVENTION	RESPONSE
<ul style="list-style-type: none"> ■ Ramsar Convention on Wetlands, 1971 ■ Framework for national action and international cooperation for the conservation and wise 	<p>The site is part of the Quaternary catchment A21B.</p> <ul style="list-style-type: none"> ■ Development to occur outside of the 1:100 year floodline ■ Rehabilitation of this drainage line should be implemented as far as possible. <p>Development and particularly storm water management, to be</p>

use of wetlands and their resources.	<p>responsive to surrounding hydrological systems. The implementation of attenuation and dissipation measures to minimise the velocity and quantity of storm water and therefore minimising environmental impacts is essential.</p> <p>Please refer to the Environmental Management Plan (EMP) – Annexure P for further information in this regard.</p>
<ul style="list-style-type: none"> ■ Agenda 21 adopted at the United Nations Conference on Environment and Development (UNCED) in 1992 ■ Action plan and blueprint for sustainable development. 	<p>The proposed development is to be planned, constructed and operated with sustainability as a key prerequisite and baseline standard.</p> <p>Please refer to Annexure P –EMP for practical steps in achieving best practice methodologies.</p>
<ul style="list-style-type: none"> ■ Convention on Biological Diversity, 1995 ■ Provided and added stimulus for a re-examining and harmonization of its activities relating to biodiversity conservation. 	<p>An ecological specialist completed an assessment of the proposed development site to determine the biodiversity and habitat value. This assessment is to inform the planning and design phases as far as possible.</p>

8.2 NATIONAL CONTEXT

The following national legislature is to be considered and applied to the development proposal during the environmental process:

Table 4: National Context

LEGISLATURE	RESPONSE
8.2.1 Spatial Planning Land Use Management (SPLUMA) Act No. 16 of 2013	
The Spatial Planning Land Use Management (SPLUMA) Act intends to provide a uniform framework for spatial planning and land use management in the republic. It seeks to promote consistency and uniformity in procedures and decision-making in spatial planning. The objectives of the Act are:	SPLUMA, has great importance with respect to good planning and development and are therefore to be aligned to as far as possible.
Provide for a uniform, effective and comprehensive system of spatial	The developer has identified this strategically located, inactive land parcel to develop an inclusionary mixed land use development, which will cater for a variety of income

LEGISLATURE	RESPONSE
planning and land use management for the Republic.	groups. The proposed development will offer various bonded housing typologies and inclusionary housing addressing the distorted spatial space in Ekurhuleni. The development will improve ownership for previously disadvantaged individuals. The proposal of a mixed use development will provide for a cohesive social and economic environment, meeting basic needs of local residents as well as addressing past spatial imbalance. The proposed development will improve access to housing (close to the Midrand Metropolitan Node and the surrounding Tembisa informal townships) and employment opportunities for previously excluded/disadvantaged groups, ensuring a development that is integrated, functional and environmentally sustainable human settlement.
Ensure that the system of spatial planning and land use management promotes social and economic inclusion;	The township establishment process and the environmental impact assessments are transparent and offer the opportunity for interested and affected parties to participate / comment on the proposed development. The processes have been designed to ensure that people's rights in respect of a healthy and economically viable environment are protected. All these aspects are taken into account during the environmental process to ensure a sustainable development.
Provide for the sustainable and efficient use of land.	Diverse land use is key to the success of this proposal as a mixed-use nodal development.
Discourage urban sprawl and promote a compact city	The proposed development site is strategically located along accessible transport corridors and urban amenities. In many instances, the legacy of Apartheid planning practices have resulted in sprawling urban areas characterized as being uneconomical and offering one-dimensional opportunities to residents. The proposed development is partly classified as infill development in terms of the Gauteng Spatial Development Framework on vacant land within the urban environment (Provincial Economic Core). The proposed development therefore will contribute to the re-engineering of the existing urban form, the establishment of a more compact city and also contribute to the optimization of the use of existing infrastructure such as bulk sewer lines, bulk roads and water.
	The proposed development will provide for inclusionary

LEGISLATURE	RESPONSE
Redress the imbalances of the past and to ensure that there is equity.	housing to those who were previously not able to own/buy property in competitive residential market. Inclusionary Housing is considered the central theme of the development and the proposed development will promote the above principle by making provision for previously disadvantage persons to participate in the property market. Furthermore the greater Clayville area is an economically disadvantaged area which will be enhanced by this proposed development.
Ensure that special consideration is given to the protection of prime and unique agricultural land.	The land presents undeveloped and underutilised land within an urban setting. Surrounding agricultural areas will not be negatively affected by this proposed township. Furthermore, no natural features like streams/wetlands or ridges will be destroyed by the development to the detriment of rural areas. The proposed development strives for the optimum utilization of this site delivering much needed housing and employment opportunities, while increasing the land value.
Uphold consistency of land use measures in accordance with environmental management instruments	<p>The proposed development is structured in a manner that is in accordance with the environmental framework of the Ekurhuleni Metropolitan Municipality and Gauteng Department of Agriculture and Rural Development (GDARD), which aims at managing the city's scarce environmental resources to achieve sustainable development. The application has taken into consideration the existing natural environment and how best to develop the land with minimal impact.</p> <p>The development is aimed at providing a high quality interface between urban elements and the natural environment in a controlled manner to ensure that these elements benefit from one another. The natural landscape will act as a green strip flowing through the entire development and linking up with the open space in surrounding developments.</p>
8.2.2 National Environmental Management Act (NEMA), 1998 (Act No 107 of 1998) and the Environmental Impact Assessment Regulations	
NEMA aims to provide for co-operative environmental governance by establishing principles for decision-making on matters affecting the environment, institutions that will promote cooperative governance and procedures for coordinating environmental functions exercised by	<p>NEMA principles are to be adhered to, with specific reference to development that promotes integrated environmental management, while being socially, environmentally and economically sustainable.</p> <p>The proposed development layout must reflect NEMA principles, such as protection of the environment for present and future generations by preventing pollution and ecological</p>

LEGISLATURE	RESPONSE
organs of state and to provide for matters connected therewith. The Act recognises that many inhabitants of South Africa live in an environment that is harmful to their health and wellbeing and focuses on the following:	degradation, promoting conservation and securing ecologically sustainable development and utilisation of natural resources.
Everyone has the right to an environment that is not harmful to his or her health or well-being	Please refer to the EMP (Annexure P) which discusses health and safety issues during the construction phase.
The State must respect, protect, promote and fulfil the social, economic and environmental rights of everyone and strive to meet the basic needs of previously disadvantaged communities	This development will provide employment opportunities (construction and operational phase therefore forming an inclusive environment with employment opportunities in close proximity to accommodation.
Inequality in the distribution of wealth and resources, and the resultant poverty, are among the important causes as well as the results of environmentally harmful practices;	Good integration is ensured due to the mixed land use character of the proposed development, as well as its location within the urban realm along public and private transport corridors. A number of communities and individuals will be able to access and invest in the proposed development.
Sustainable development requires the integration of social, economic and environmental factors in the planning. implementation and evaluation of decisions to ensure that development serves present and future generations	Social and environmental aspects are taken into consideration during the environmental impact assessment process, along with appropriate market feasibility research, to ensure that the project is viable and sustainable. The proposed development responds to the Regional Spatial Development Framework of the local municipality.
Everyone has the right to have the environment protected, for the benefit of present and future generations through reasonable legislative and other measures that: <ul style="list-style-type: none"> ■ prevent pollution and ecological degradation ■ promote conservation ■ secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development 	The proposed development plan ensures that areas of cultural and ecological value are maintained. Also, please refer to the EMP (Annexure P) which thoroughly discusses aspects that are related to ecological preservation, conservation and sustainable development.
The environment is a functional area of concurrent national and provincial	Applicable national, provincial and municipal legislation is taken into account and aligned to during the environmental

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legislative competence, and all spheres of government and all organs of state must co-operate with, consult and support one another	impact assessment process
<p>Furthermore, this act develops a framework for integrating good environmental management into all development activities, while establishing principles guiding the exercise of functions affecting the environment.</p> <p>Integrated Environmental Management (IEM) is designed to ensure that the environmental consequences of development proposals are understood and adequately considered in the planning, implementation and management of all developments. It is intended to guide, rather than impede the development process by providing an approach to gathering and analysing information, and ensuring that it can be easily understood by all interested and affected parties in the development. The purpose of IEM is to resolve or lessen any negative environmental impacts and to enhance positive aspects of development proposals.</p>	<p>A thorough impact assessment process has been undertaken – derived from:</p> <ul style="list-style-type: none"> ▪ Public Participation ▪ Specialist studies ▪ Map assessments ▪ Institutional and legal assessment <p>This process allows for adequate planning and mitigation. Please refer to the section of this report which provides information on the assessment process.</p>
8.2.3 The National Water Act, 1998 (Act No 36 of 1998)	
<p>The National Water Act:</p> <ul style="list-style-type: none"> ▪ Recognizes that water is a scarce and unevenly distributed national resource which occurs in many different forms which are all part of a unitary, inter-dependent cycle ▪ Recognizes that while water is a natural resource that belongs to all people, the discriminatory laws and practices of the past have prevented equal access to water, and use of water resources ▪ Acknowledges the National 	<p>In essence, the proposed development should align to the purpose of this Act, therefore ensuring that the nation's water resources are protected, utilised, developed, conserved, managed and controlled in ways that take the following into account:</p> <ul style="list-style-type: none"> ▪ Meeting basic human needs of present and future generations ▪ Promoting equitable access to water ▪ Promoting efficient, sustainable and beneficial use of water in the public interest ▪ Reducing and preventing pollution and degradation of water resources ▪ Facilitating social and economic development

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<p>Government's overall responsibility for and authority over the nation's water resources and their use, including the equitable allocation of water for beneficial use, the redistribution of water, and international water matters</p> <ul style="list-style-type: none"> ■ Recognizes that the ultimate aim of water resource management is to achieve the sustainable use of water for the benefit of all users ■ Recognizes that the protection of the quality of water resources is necessary to ensure sustainability of the nation's water resources in the interests of all water users ■ Recognizes the need for the integrated management of all aspects of water resources and, where appropriate, the delegation of management functions to a regional or catchment level so as to enable everyone to participate 	<ul style="list-style-type: none"> ■ Providing for the growing demand for water use <p>The Act requires that (where applicable) the 1:50 and 1:100 year flood line be indicated on all the development drawings that are being submitted for approval. These flood lines have been indicated, the proposed development is situated outside the 1:50 and 1:100 year floodline. Where services infrastructure is required to cross the wetlands an application for a Water Use Licence will be submitted to the Department of Water and Sanitation.</p> <p>Please refer to Figure 22 – Environmental Composite.</p>
8.2.4 National Environmental Management: Biodiversity Act, (Act No 10 of 2004)	
<p>The National Environmental Management: Biodiversity Act aims to provide for the management and conservation of South Africa's biodiversity within the framework of the National Environmental Management Act1, 1998; including the –</p> <ul style="list-style-type: none"> ■ Protection of species and ecosystems that warrant national protection ■ The sustainable use of indigenous biological resources ■ The fair and equitable sharing of benefits arising from bio-prospecting involving indigenous biological resources ■ The establishment and functioning of a South African National 	<p>An ecological specialist was appointed to undertake the biodiversity assessment, with specific attention to Red Data Listed species, habitats and biodiversity</p> <p>The specialist study is aligned to requirements of this act.</p> <p>The proposed development aligns to the purpose of this Act and the above-mentioned specialist report.</p> <p>The sustainable utilisation of indigenous biological resources, i.e. indigenous vegetation species will be reintroduced to the newly created urban open spaces as far as possible, thereby resulting in an ecological urban regeneration strategy.</p> <p>Please refer to Annexure P –EMP for additional information.</p>

LEGISLATURE	RESPONSE
Biodiversity Institute; and for matters connected therewith	
8.2.5 The National Heritage Resources Act, 1999 (Act No 25 of 1999) (NHRA)	
<p>The NHRA focuses on the following, that have reference to the development of land:</p> <ul style="list-style-type: none"> ■ To introduce an integrated and interactive system for the management of the national heritage resources ■ To promote good government at all levels, and empower civil society to nurture and conserve their heritage resources so that they may be bequeathed to future generations ■ To lay down general principles for governing heritage resources management throughout the Republic ■ To introduce an integrated system for the identification, assessment and management of the heritage resources of South Africa ■ To establish the South African Heritage Resources Agency together with its Council to co-ordinate and promote the management of heritage resources at national level ■ To set norms and maintain essential national standards for the management of heritage resources in the Republic and to protect heritage resources of national significance ■ To provide for the protection and management of conservation-worthy places and areas by local authorities; and to provide for matters connected therewith 	<p>The proposed development should respond to the requirements of the National Heritage Resources Act as well as that of the South African Heritage Resources Agency (SAHRA).</p> <p>Section 38 of the NHRA makes provision for application by developers for permits before any heritage resources may be damaged or destroyed.</p> <p>A specialist in the field was appointed to conduct a Cultural Heritage Resources Impact Assessment.</p> <p>Near the middle of the site is a natural pan and nearby two Ndebele farm settlements. Both settlements date from the late 1940's and are important from a local heritage point of view.</p> <p>Except for the two Ndebele farm workers settlements no other important cultural heritage resources or graves have been found on the proposed development site.</p> <p>The two farm workers settlements are important and should be fully recorded in a Phase II cultural heritage resources impact assessment before an application can be made for demolishing permit.</p> <p>In the event that artefacts / graves / areas of cultural significance are discovered during the construction phase, all work should be halted and a cultural heritage practitioner should be appointed to examine the site and make appropriate recommendations.</p>
This legislation aims to promote good management of the national estate, and	The importance of cultural heritage and its related preservation is discussed within the EMP (Annexure P).

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<p>to enable and encourage communities to nurture and conserve their legacy so that it may be bequeathed to future generations. It recognises that our heritage is unique and precious and it cannot be renewed as it –</p> <ul style="list-style-type: none"> ■ Helps us to define our cultural identity and therefore lies at the heart of our spiritual well-being and has the power to build our nation ■ Has the potential to affirm our diverse cultures, and in so doing shape our national character ■ Celebrates our achievements and contributes to redressing past inequities ■ Educates and deepens our understanding of society and encourages us to empathise with the experience of others ■ Facilitates healing and material and symbolic restitution and it promotes new and previously neglected research into our rich oral traditions and customs 	<p>The EMP places focus on the education of people regarding places of heritage value and artefacts, should they come across them during their work activities.</p>

8.3 PROVINCIAL CONTEXT

Please note that the below section only highlights some of the most prudent issues in this regard.

Table 5: Provincial context

DOCUMENT	RESPONSE
8.3.1 Gauteng Planning and Development Act (Act No 3 of 2003) (GPDA)	
The GPDA states that Policy, administrative practice and law in the Province shall promote development and land use which:	
Promotes the more compact development of urban areas and the limitation of urban sprawl and the protection of agricultural resources;	The proposal addresses this requirement via its position within the urban realm adjacent to existing and proposed transport corridors, existing and proposed development and adjacent to urban amenities. Also, the mixed-use character caters for

DOCUMENT	RESPONSE
	higher densities which will minimise the necessity for urban development on the outskirts of urban areas.
Supports the correction of historically distorted spatial patterns of settlement in Gauteng;	To be addressed as far as possible with regard to the provision of more affordable high density accommodation (residential 2 and 4) as well as lower density housing (residential 1) therefore catering for a greater socio-economic spectrum.
Promotes integrated land development in rural and urban areas in support of each other;	This proposal forms part of a greater planning framework for the area and integration is ensured via appropriate service and infrastructure provision, the provision of linking transport corridors and the continuity of ecological corridors.
Results in the use and development of land that optimises the use of existing resources such as engineering services and social facilities; and	Existing bulk services are to be utilised as far as possible with appropriate upgrades where necessary.
Owens positive development qualities, particularly with regard to public environments.	The urban design framework and planning methodologies cater for inclusive design at a pedestrian scale, incorporating public open spaces and positive streetscapes.
<p>Policy, administrative practice and law in the Province shall with due regard to the principles of the National Environmental Management Act, 1998 (Act 107 of 1998) promote sustainable development that:</p> <ul style="list-style-type: none"> ■ Is within the fiscal, institutional and administrative means of the Province ■ Meets the basic needs of all citizens in an affordable way ■ Establishes viable communities with convenient access to economic opportunities, infrastructure and social services ■ Optimises the balanced use of existing resources, including resources relating to agriculture, land, water, minerals, services infrastructure, transportation and social facilities ■ Balances environmental considerations of preserving natural resources for future generations with economic development practices and processes 	<p>Sustainable principles are to be incorporated as far as possible within the planning, design, construction and operational phases therefore ensuring an appropriate balance between social, economic and environmental contexts.</p> <p>The environmental impact assessment process ensures that sound land development practices are implemented, creating a balance between environmental, social and economic requirements.</p>

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<ul style="list-style-type: none"> Ensures the safe utilisation of land by taking into consideration its biophysical factors such as geology and undermined or hazardous areas 	
8.3.2 Gauteng Spatial Development Framework (GSDF)	
<p>The purpose of the Gauteng Spatial Development Framework (GSDF) is to communicate a shared future spatial vision and structure for the Province. The GSDF is clear and unambiguous about the fact that growth and development within the province should be strategically guided and directed and not purely just a consequence of spontaneous and organic growth. The GSDF provides an overarching spatial vision for the Province and hence provides guidance and influences the Ekurhuleni Metropolitan Spatial Development Framework with specific regards to the location and nature of the physical development.</p> <p>The following key considerations contained within the GSDF are identified and highlighted due to its importance and relevance in as far as the application is concerned:</p> <ul style="list-style-type: none"> Urban growth should be contained; Resource based economic development (resulting in the identification of the economic core); Re-direction of urban growth (stabilise/limit growth in economically non-viable areas, achieve growth on the land within the economic growth sphere); Protection of rural areas and enhancement of tourism and agricultural related activities; Increased access and mobility. <p>The primary structuring elements identified within the GSDF are those of:</p>	<p>The Clayville X50 township mixed use development on Portion 30, Portion 31 and the remainder of portion 183 of the Farm Olifantsfontein 410 J.R complies to the principles of the Gauteng Spatial Development Framework in light of the fact that the development concept aims to move away from the typical low density development concepts characteristic of the surrounding area. Through the increase in development density the concept promotes a higher intensity development proposal whilst still acknowledging the importance of the sensitive environment within which the development is located and also preventing urban sprawl.</p> <p>Ample private open space is provided as part of the proposed development ensuring that sensitive areas are protecting and also providing recreational areas.</p>

DOCUMENT	RESPONSE
<ul style="list-style-type: none"> • Urban mixed-use activity nodes; • Open space and green system; • Public transit and movement routes; • Urban corridors and activity spines. <p>In addition to the above the GSDF sets out to guide and structure growth, in a balanced manner, towards the notion of a “sustainable city”. Within the GSDF the notion of a “sustainable city” is explained as the focus on achieving a life-enhancing urban environments for all individuals, in which acceptable standards of living are met without compromising the ecological, cultural, social, economic, security or legal pre-conditions necessary for continued viability.</p> <p>In order for South African cities to achieve the status of a “sustainable city” a number of development principles need to be achieved, which include:</p> <ul style="list-style-type: none"> • A more compact urban form that discourages dispersed low-density urban sprawl; • The promotion of a diverse combination of land-uses that enables a greater intensity of mixed-use development; • A more complex urban system that spawns opportunity through diversity of activity patterns and brings associated economic and employment opportunities through integrated development; • The integration of the historically marginalised areas into the mainstream of urban life by correcting the spatial patterns of the urban environment; • Optimising the utilisation of existing service infrastructure and social amenities particularly where space capacity exists; • Enabling accessibility to affordable and efficient means of public and private 	

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<p>transportation;</p> <ul style="list-style-type: none"> • Furthering the development of employment opportunities and residential areas in close proximity to or integrated with each other; • Promoting physical development based on ecological sound principles that bring the natural environment and the urban system into a mutually reinforcing and integrated relationship; and • Understanding the open space system of a city-region as an integral part of the city-region's morphology, economic makeup and a defining element of urban quality. 	
8.3.3 The Gauteng Draft Red Data Policy	
<p>The primary purpose of the Draft Red Data Policy is to protect red data plant species in Gauteng Province. The Red Data plant policy is based on the following basic principles:</p> <p>Species endemic to the province of Gauteng must be afforded the utmost protection, as they occur nowhere else in the world. As the relevant provincial agency, this Department's responsibility towards Gauteng endemics is absolute;</p> <p>Conservation of only one population essentially ignores the lowest level of biodiversity that is genetic diversity. It is therefore imperative that all populations of Red Data plant species are protected;</p> <p>In situ conservation is preferable to ex situ conservation. Removing a population from its natural habitat and placing it under artificial conditions results in the erosion of the inherent genetic diversity and characteristics of that species;</p> <p>In order to ensure the persistence of a population, it is imperative that the ecological processes maintaining that population persist;</p> <p>In order to ensure the persistence of a plant population, it is vital that pollinators are conserved. To conserve pollinators, the habitat</p>	<p>An ecological specialist was appointed to assess the proposed development sites fauna and flora biodiversity, with specific attention to Red Data Listed species.</p> <p>No Red or orange Data Listed floral species were noted during the field assessment. No protected tree species as listed by DWS (National Forests Act 84 of 1998)) were noted.</p> <p>By developing this portion of land which is centrally located within the urban realm and adjacent to existing and future urban infrastructure, urban sprawl and the development of rural locations are minimised. There were areas within the proposed development site that offer good habitat type and quality that would support a wide diversity of species, some of which are RDL. These areas have been incorporated into a proposed ecological sensitivity map.</p> <p>RDL species that may be potentially dependent on the area to be affected by the proposed development activities are well-represented within protected areas within the region. It is therefore perceived that the proposed development activities will not have a significant impact on the overall conservation of RDL flora and fauna within the region.</p>

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<p>must be managed to provide appropriate nest sites for pollinators and a seasonal succession of suitable forage and host plants. Pollinators must be protected from herbicide and pesticide application and soil disturbance must be prevented;</p> <p>Translocation of Red Data species is an unacceptable conservation measure since the translocated species may have undesirable ecological effects;</p> <p>Rural parts of the province should be protected from insensitive developments and urban sprawl/encroachment should be discouraged. Policy guiding developments should therefore be less lenient in rural areas;</p> <p>Red Data plant species historically recorded on a site, but not located during searches within species flowering seasons may be dormant (as a seed bank or subterranean structures such as bulbs/tubers/etc.) due to unfavourable environmental conditions;</p> <p>Suitable habitat adjacent to known populations of Red Data plant species has a high probability of being colonized;</p> <p>In order to protect a plant population that occurs in a fragmented landscape from edge effects, it is necessary to protect it with a buffer zone that extends from the edge of the population; and</p> <p>The transformation of natural vegetation to crops is considered as permanent as urbanization and may cause the extinction of Red Data plant populations and their pollinators.</p>	<p>Please refer to Annexure D – Vegetation Assessment and Annexure E – Amphibian Habitat Assessment</p> <p>Please refer to Figure 22 – Environmental Composite</p>
8.3.4 The Gauteng Draft Ridges Policy	
<p>The quartzite ridges of Gauteng are one of the most important natural assets in the northern provinces of South Africa. This is because these ridges, and the area immediately surrounding the ridges, provide habitat for a wide variety of fauna and flora, some of which are Red List, rare or endemic species or, in the</p>	<p>The GDARD Conservation Plan (Version 3) has indicated that there are no ridge areas on the proposed site.</p> <p>No ridge areas were encountered during the site assessment conducted by the Ecology Specialists. Please refer to Figure 5 – GDARD Policies</p>

DOCUMENT	RESPONSE
<p>case of certain of the plant species, are found nowhere else in South Africa or the world. The ridges also fulfil functions that are necessary for the sustainability of ecosystems such as the recharging of groundwater, wetlands and rivers, wildlife dispersal and providing essential habitat for pollinators. Ridges also have a socio-cultural role in that they provide aesthetically pleasing environments that are valued by residents, tourists and recreational users. Human activities such as urbanization, mining and the planting of alien vegetation may undermine the contribution that ridges make to the environment.</p> <p>The conservation of ridges falls within the ambit of the environmental right and this policy comprises one of the measures that GDARD has taken to give effect to the environmental right in respect of ridges, therefore ensuring that:</p> <ul style="list-style-type: none"> ■ The use of ridges is sustainable; ■ Members of the public are able to make informed decisions regarding proposals for development on ridges and the use of ridges; ■ Officials make consistent decisions in respect of planning and environmental applications that involve negative impacts on ridges; and ■ The Department's responsibility in respect of the protection of the environment is carried out in an efficient and considered manner. 	
8.3.1 GDARD Conservation Plan, Version 3	
<p>A comprehensive Provincial Conservation Plan (C-Plan) was launched as a decision support tool in September 2005 to protect the province's ecosystems and associated biodiversity and to act as an information tool for the conservation of sensitive areas. The C-Plan was an outcome of the Gauteng</p>	<p>According to CPlan3 the proposed development site is not affected by irreplaceable or protected areas.</p> <p>There are areas classified as important and ecological support areas on the site.</p> <p>Please refer to Figure 3 & 4 – GDARD Policies and</p>

DOCUMENT	RESPONSE
<p>Biodiversity Gap Analysis Project (BGAP). The C-Plan system maps important biodiversity areas in Gauteng and provides information to protect important and sensitive areas within the province. This information is used by government as a decision-making tool with regard to EIA approvals.</p> <p>The second version (C-Plan version 2) indicated that 25 percent of Gauteng needs to be conserved to meet the Province's biodiversity targets. The C-Plan includes protected areas, irreplaceable and important sites due to the presence of Red Data species, endemic species and potential habitat for these species to occur.</p>	<p>Figure 5 – GAPA</p> <p>Please refer to Annexure D – Vegetation Assessment and Annexure E Amphibian Habitat Assessment</p>
<p>8.3.1 Protection of Agricultural Land in Gauteng Revised Policy (June 2006)</p>	
<p>The purpose of this policy is to protect land that has been identified as high agricultural potential from development, for the exclusive use of agricultural production to:</p> <ul style="list-style-type: none"> ■ Feed the nation; ■ Provide upcoming farmers with access to productive land; and ■ Meet national targets set in this regard. <p>Land with high agricultural potential is a scarce non-renewable resource and the need to protect it is a high priority for GDARD. GDARD applies a risk averse and cautious approach when development of such land for purposes other than agricultural production is proposed. The risk averse and cautious approach should be the basis of decision-making on the transformation of high potential agricultural land and land deemed as irreplaceable in terms of meeting Agri-BBBEE and national food security targets and thus legally protected from transformation.</p> <p>GDARD is not in support of development on high potential agricultural land that resides</p>	<p>The proposed development site, according to the Gauteng Agricultural Potential Atlas (GAPA Version 3), is not situated within a region delineated as an Agricultural Hub; however the GAPA information indicates that a portion of the development site has moderate agriculture potential and a small portion of the site has been classified as having low agricultural potential.</p> <p>An Agricultural potential study has been carried by Index and the results can be summarised as follows:</p> <p>The following conclusions can be made:</p> <ul style="list-style-type: none"> • No land is presently under irrigation, there is also no water available. • The property has only 21 hectare medium to high potential soil. Further, no land was found to be high potential for rainfed cropping according to the departmental guidelines. • The site is suitable for livestock, but the income that can be derived from the number of cattle that the property can keep, is not high enough to cover overhead costs if the farm was managed as a financial venture.

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outside the urban edge. Seven agricultural hubs have been identified in the Gauteng Province. All the hubs are located outside the urban edge. The hubs are regarded as areas with a large amount of high agricultural potential land that should be preserved for agricultural use and will accordingly be planned and managed as a holistic agricultural unit. Each of the hubs will be developed to align with its agricultural potential and preferred land use and will be supported by current economic indicators.	<p>In conclusion, the property is not a viable farming unit.</p> <p>Please refer to Figure 5 – GAPA</p>

8.4 LOCAL CONTEXT

Please note that the below section only highlights some of the most prudent issues in this regard.

Table 6: Local Context

DOCUMENT	RESPONSE
8.4.1 Ekurhuleni Metropolitan Municipality Spatial Development Framework (SDF)	
<p>The vision of the Ekurhuleni Metropolitan Municipality is to be The Smart, Creative and Developmental City. Based on the vision the mission statement that was developed for the Ekurhuleni Metropolitan Municipality reads as follows: <i>Ekurhuleni provides sustainable and people centred development services that are affordable, appropriate and of a high quality. We are focussed on social, environmental and economic regeneration of our city and communities, as guided by the principles of Batho Pele and through the commitment of a motivated and dedicated team.</i></p> <p>The Ekurhuleni spatial objectives has been identified as follows:</p> <ul style="list-style-type: none"> • Create a single, uniform identity for Ekurhuleni Metropolitan Municipality; • Develop a well-defined system of activity nodes; • Promote the development of a sustainable 	<p>All these aspects have been responded to as per the urban design framework and the town planning application.</p> <p>The proposed site falls within an area classified as an urban development zone. According to the draft RSDF “urban development” essentially means residential development inclusive of all social and community facilities as well as business land uses as required for sustainable urban life (i.e. limited retail, consulting rooms, etc) as per the tertiary nodes.</p> <p>The site of application is located within close proximity to a tertiary node as well as a public transport route</p> <p>Medium density development should take place on land within 500 meters from a tertiary node and public transport routes. Medium density is considered to be between 60 and 120 units per hectare. Although the effective density of the</p>

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<p>compact urban structure;</p> <ul style="list-style-type: none"> • Create a sustainable and functional open space network; • Optimise job creation capacity of the formal economy; • Integrate the disadvantaged communities into the urban fabric; • Actively promote sustainable public transport; • Promote access to social and municipal services through CCAs; • Identify the spatial impact of climate change; • Promote sustainable livelihoods development; • Promote sustainable development; and • Optimise the comparative advantages of Ekurhuleni Metropolitan Municipality. <p>The conceptualisation of the Spatial Development Framework is guided by the vision of the Ekurhuleni Metropolitan Municipality and the spatial concept developed for the Ekurhuleni Metropolitan Municipality. The purpose of the concept is not only to guide the future development of the Metropolitan area, but also to ensure integration of Regions A – F.</p> <p>The draft concept developed in order to provide guidance to spatial development promotes amongst others a compact urban development footprint.</p> <p>The MSDF provides a clear indication of the broad land use pattern to be developed in Ekurhuleni to achieve sustainable spatial development and to thus overcome the spatial imbalances of the past. The plan is at a level of detail, which clearly provides spatial development guidance at the macro level and yet provides sufficient flexibility for urban planning at the regional and local levels, which will be reflective of the needs of the relevant era.</p> <p>The proposed site falls within Region B of the</p>	<p>development is considerably lower than 60 units per hectare the RSDF allows for densities in excess of the proposed densities.</p> <p>Refer to Figure 7 below</p>

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<p>Regional Spatial Development Framework</p> <p>Region B is favourably located in the Economic Activity and Employment Area of the Gauteng Province. Furthermore, Region B is in close proximity to the ORTIA and is located within the core of the Aerotropolis. This locality further enhances the development potential of the region.</p> <p>Region B can be described as a multi-centred region as it has multiple locations of economic activity (business and industrial) and human settlements. Urban development in Region B is predominantly west of the R21 Freeway, whilst development east of the R21 Freeway is generally agricultural in nature.</p> <p>The existing residential developments in Region B occur primarily on the western boundary, between the R21 and the Ekurhuleni Metropolitan Municipality /Johannesburg municipal boundary. The only residential development east of the R21 is the Serengeti Golf Estate. Most residential development in Region B is low density residential in nature, but new residential developments are mainly medium to high density. Informal settlements, backyards and hostels are located mostly in the Tembisa area. In the Ekurhuleni Metropolitan Municipality there are approximately 165 000 informal structures in 199 informal settlements. 22% (33 505 units) of these informal structures are located in 12 informal settlements within Region B.</p> <p>The regions locality, predominant land use and the development pressures are the principal elements which influence the role and function of the Region within the broader metropolitan context. In order to create a development concept for Region B a future vision of the role that it will play in relation to the broader Ekurhuleni Metropolitan Municipality area was outlined:</p>	

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<p>The role of Region B is to:</p> <ul style="list-style-type: none"> • Accommodate the future urban growth related to the Aerotropolis and the eastward expansion of economic activity within the Gauteng Province; • Maximise the agricultural potential as the growing economy of the region provides an opportunity for the expansion/intensification of the agricultural sector; and • Ensure linkages to Johannesburg and Tshwane. <p>The function of Region B is to:</p> <ul style="list-style-type: none"> • Enhance and protect the existing urban fabric; • Ensure the seamless integration between new and existing development; • Integration between urban and agricultural areas; • Provide for properly planned urban expansion towards the east. <p>For Region B to develop in a sustainable manner, to absorb the growth and to alleviate the development pressure it was important to prepare for growth and development in advance at a sufficient scale. Therefore the focus in Region B should be on enhancing the accessibility of the region and to diversify and strengthen the economic base.</p> <p>The following guidelines are applicable to urban development areas:</p> <ul style="list-style-type: none"> • Develop an urban structure of walkable neighbourhoods; • Foster a sense of place in neighbourhoods through design and clustering of non-residential land uses; • Provide access by way of an interconnected network of streets which facilitate safe walking, cycling and driving; • Provide a variety of erf sizes and housing types 	

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<p>to cater for the diverse housing needs of the community;</p> <ul style="list-style-type: none"> • Incorporate key environmental areas into the design of neighbourhoods for the benefit of all; • Integrate the design of open space and stormwater management; 	
8.4.2 Ekurhuleni Metropolitan Open Space Framework (EBOSS)	
<p>The metropolitan open space system is conceptually based on the Gauteng Open Space Policy – Phase 2, the Ekurhuleni Environmental Management Framework and the Ekurhuleni Biodiversity and Open Space Strategy (EBOSS).</p> <p>Essentially this open space system, which includes a primary and secondary open space system, is designed around the sensitive areas (i.e. the drainage systems, the ridges and the pans), parks, the sport/recreation grounds and other large open spaces (i.e. golf courses, office parks/industrial, etc. An important principle is that open space conservation and planning followed a “Holistic and Integrated Planning” approach. This ensures that all the environmental considerations (social, economic, ecological and institutional) are effectively integrated into all spatial and economic activity. Integrated development planning is not only limited to ecological damage, but also to ensure environmental sustainability, for example flood-attenuation.</p>	<p>All these aspects have been responded to as per the urban design framework and town planning application.</p>

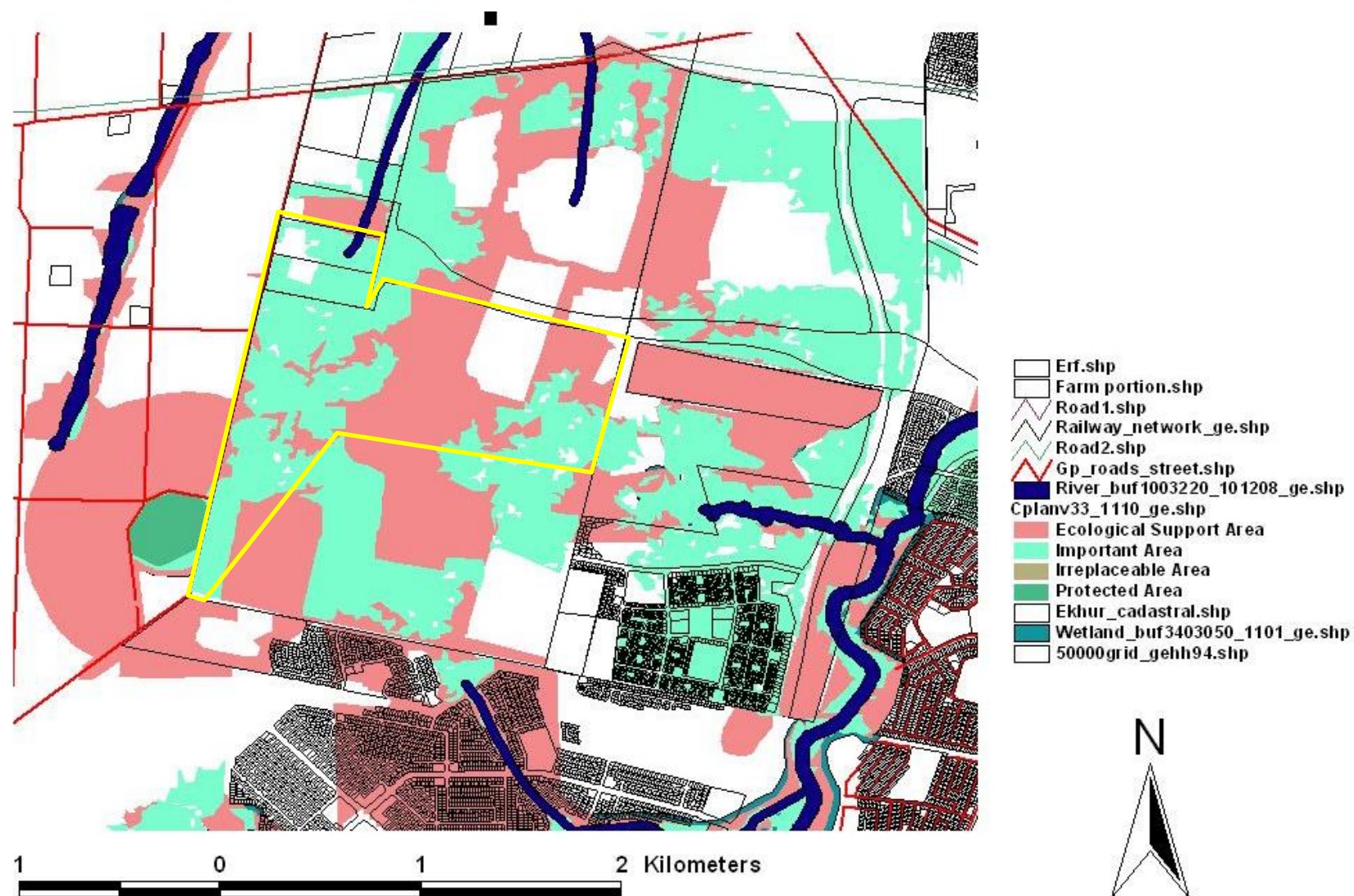


Figure 3: C-Plan 3 (Source: GDARD policies)

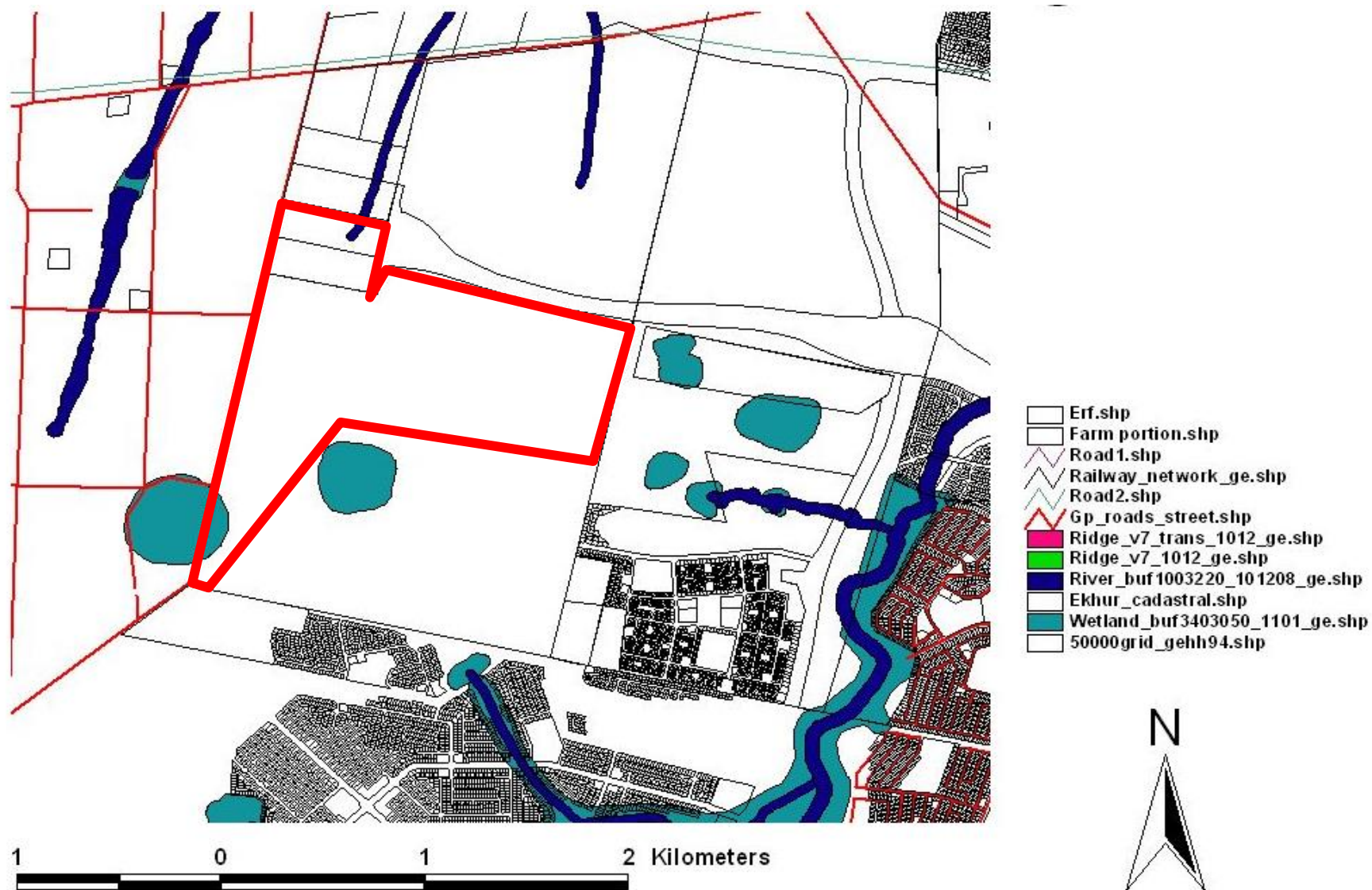


Figure 4: Rivers, wetlands and Ridges according to GDARD's C-plan 3

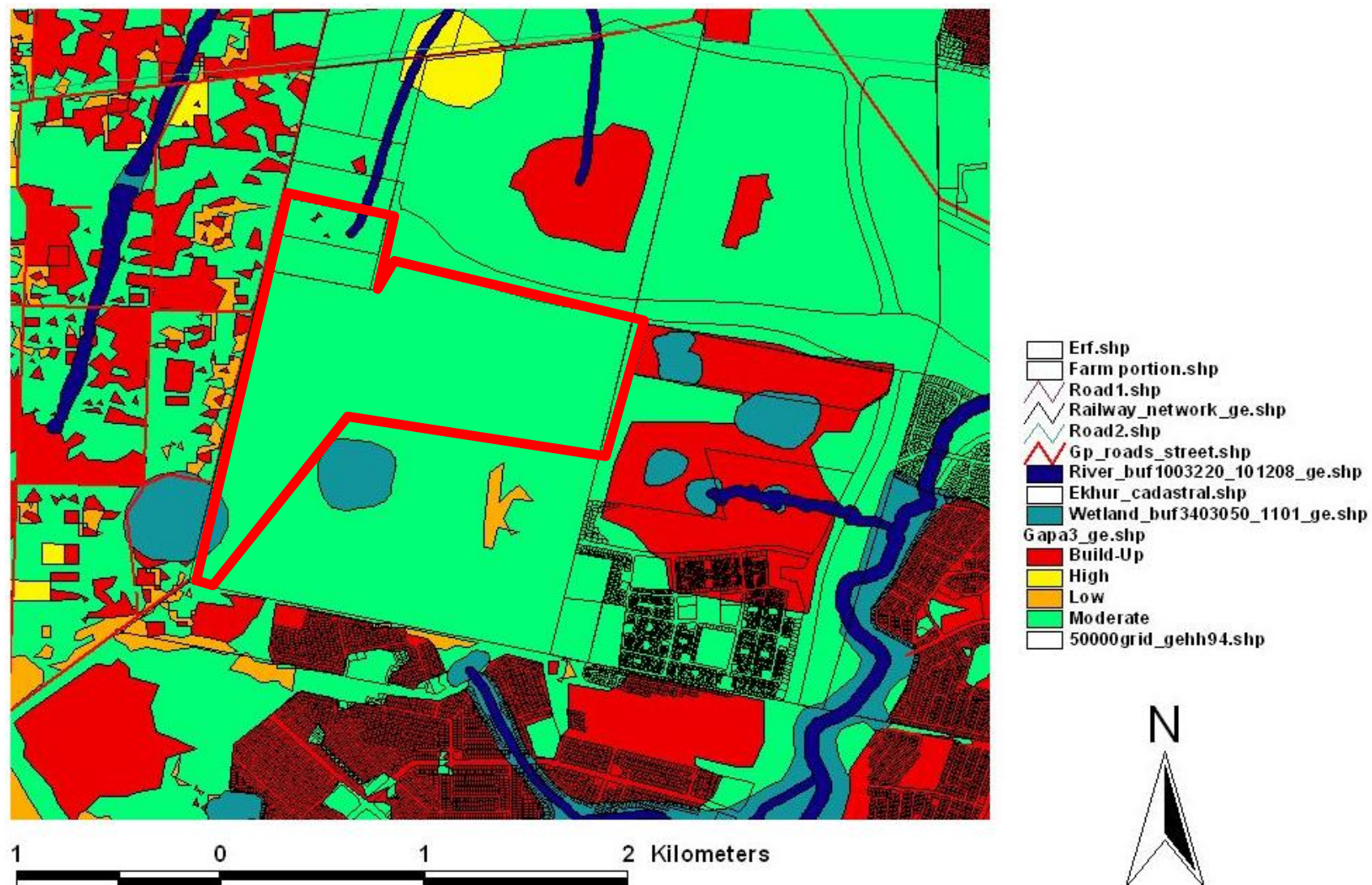


Figure 5: Gauteng Agricultural Potential Atlas (GAPA) (Source GDARD)

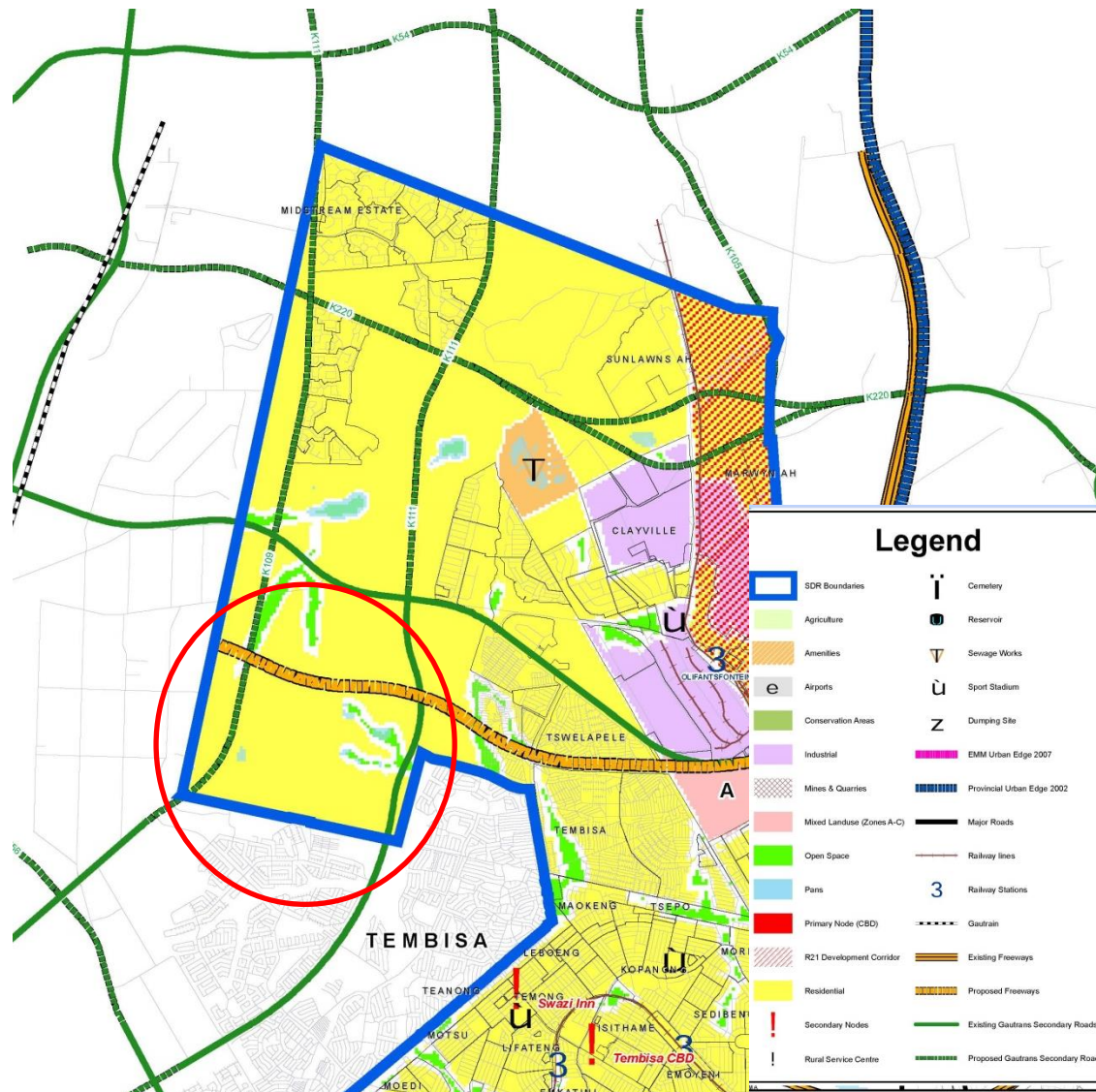
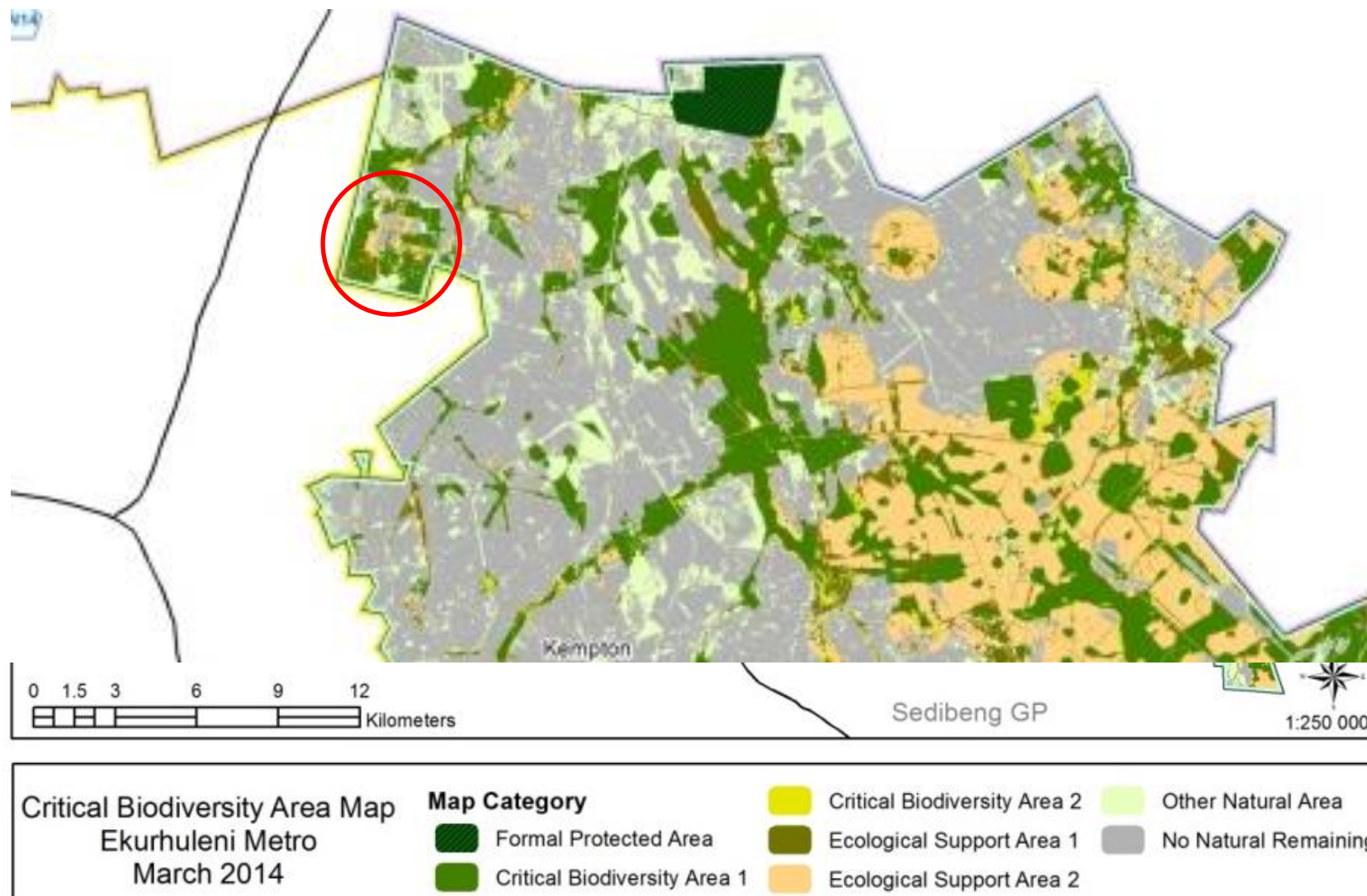


Figure 6: SDF for Region B of the Ekurhuleni Spatial Development Framework, the yellow shading represents areas earmarked for urban development

Figure 7:
Ekurhuleni
Metropolitan
Open Space
Framework
(EBOSS)



9.0 DESCRIPTION OF THE BIO-PHYSICAL ENVIRONMENT

9.1 CURRENT LAND USE, ZONING AND SITE CHARACTER

In terms of the Halfway House and Clayville Town Planning Scheme, 1976 the subject property is currently zoned “Agricultural”.

The largest part of the property is currently vacant and is therefore not utilised for any specific use, except for the two Ndebele farm workers settlements on the site.

9.2 SURROUNDING LAND USE, ZONING AND CHARACTER

The proposed site is situated in the Ekurhuleni Metropolitan Municipality.

The surrounding land uses of the proposed development site are primarily dominated by a combination of high density low cost township developments to the south and low density agricultural holdings to the north.

There is vacant land, old mining activities, agricultural land, Olifantsfontein Road and Midstream estate situated to the north of the proposed site.

Tembisa (high density development) and Ivory Park (high density development) is situated to the east of the proposed site. Furthermore the Kaalspruit is situated to the east of the proposed development.

Ebony park (high density housing), the SPCA, Midrand Vehicle Testing Station, Grand Central Aerodrome and the Eskom College and Trainign Centre is situated to the south of the proposed development.

The Glen Austin Pan and Bird Sanctuary is situated to the south west of the proposed development, also the Glen Austin Agricultural Holdings (low density residential), the Olifantspruit and the N1 highway is situated to the west of the proposed development.

Further points of interest and activities within a 5km radius include a number of primary and secondary schools, sporting facilities (ski centre, sports fields), health facilities (municipal clinics, government hospitals), shopping centres, service stations, government offices, tourist facilities and hotels, as well as the Grand Central Airport.

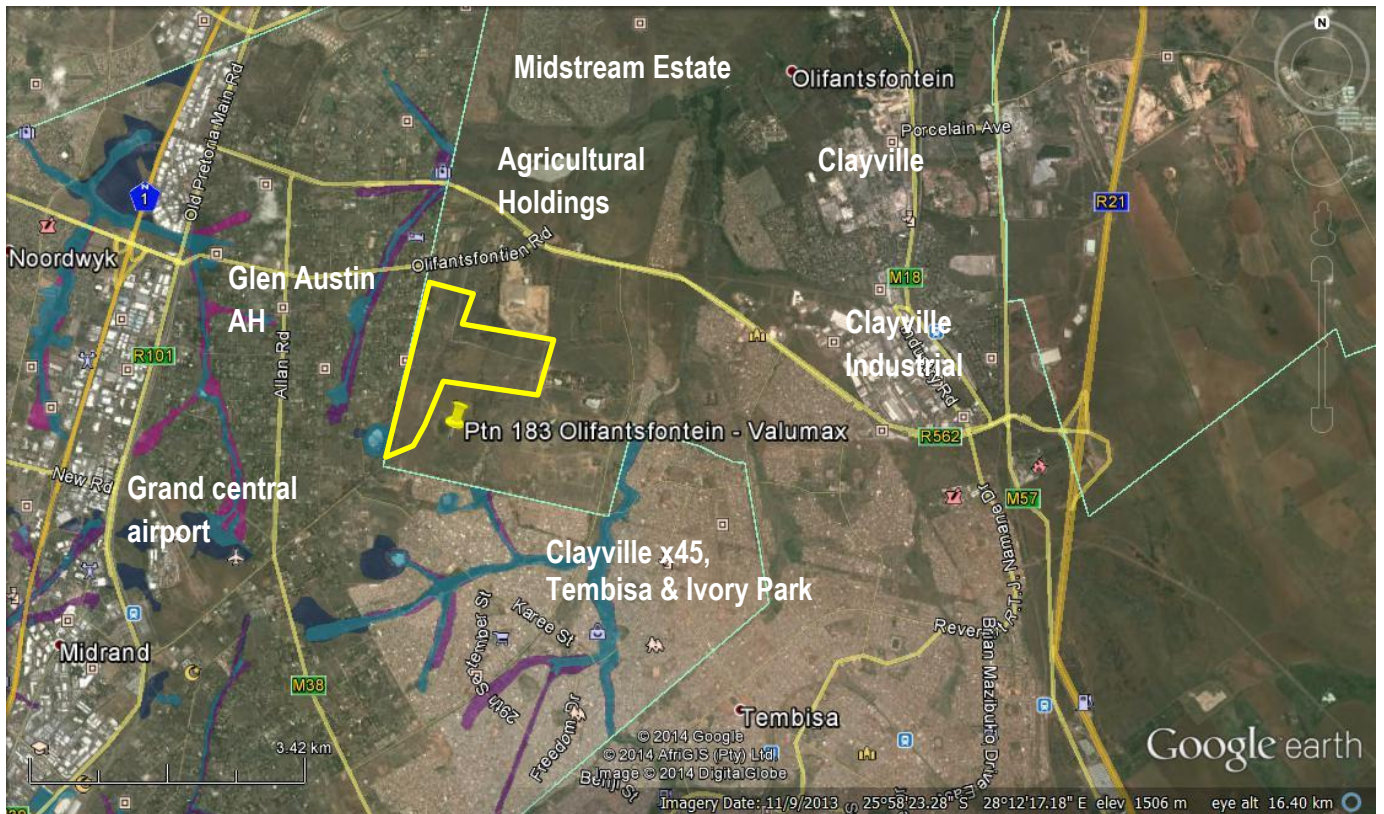


Figure 8: Aerial photograph depicting surrounding land uses

9.3 TOPOGRAPHY & HYDROLOGY

The site has an approximate average site gradient of 5 – 12 percent.

Natural vegetation consists of veld grasses. There are areas of medium hard rock and hard rock and sub-outcrop in sectors of the site which lies immediately north of the Glen Austin fault belt.

The proposed site falls within the A21B quaternary catchment which is drained by the Hennops River. The study area is the source of two tributaries that flow into the Kaalspruit. To the north, just outside the border of the study area is the source of a tributary of the Olifantsspruit, which is itself a tributary of the Kaalspruit.

A small portion of the Glen Austin Pan is situated along the south wester section fo the site. Two tributaries of the Kaalspruit have their source within the proposed site, one draining in a south easterly direction and the other in the central portion of the site, to the east.

Perched seasonal groundwater conditions should be anticipated to develop on horizons of reworked residual granite and ferricrete soil units on the site. The seasonal nature of these shallow groundwater regimes should be recognised.

The groundwater under the site lies in an unconfined aquifer that is the groundwater will be generally contained in a variety of secondary structures within the bedrock such as joints, cracks, fissures and faults. The bedrock in this area (generally) poor yielders of water and would be classed as “minor”

aquifers. However any containment liquids entering the bedrock structures are likely to flow comparatively rapidly through the secondary features with hardly any attenuation of pollutants.

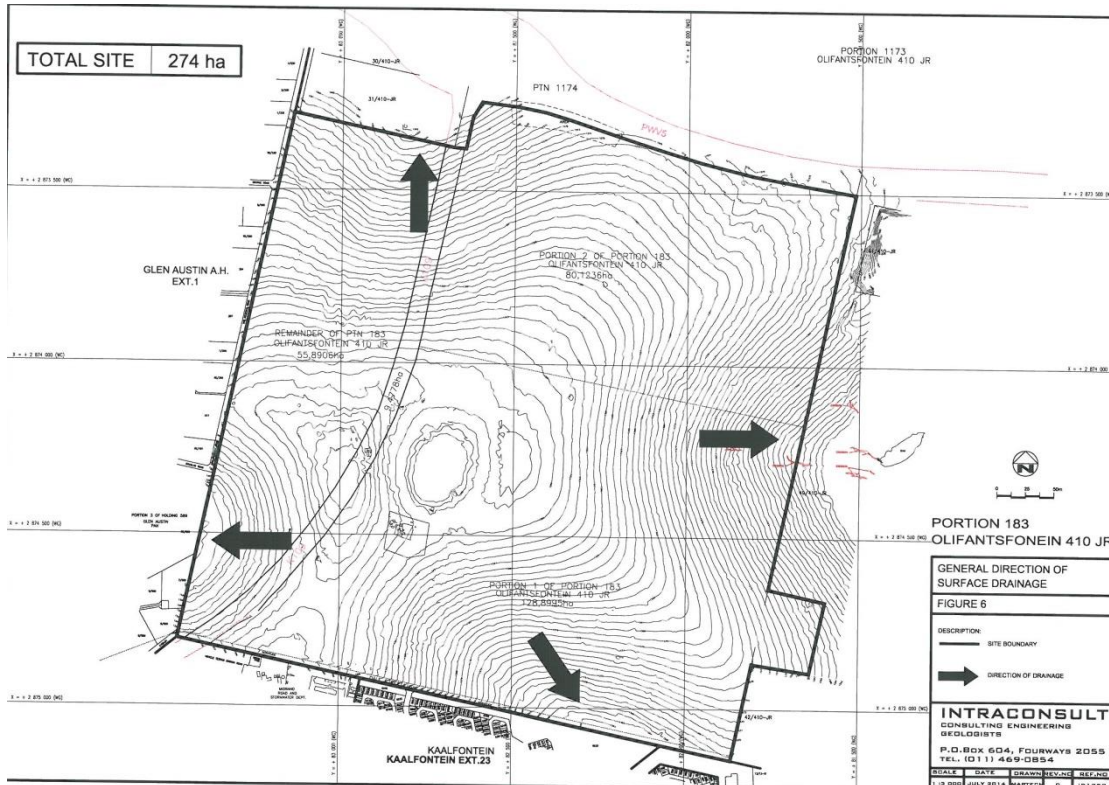


Figure 9: Contour map

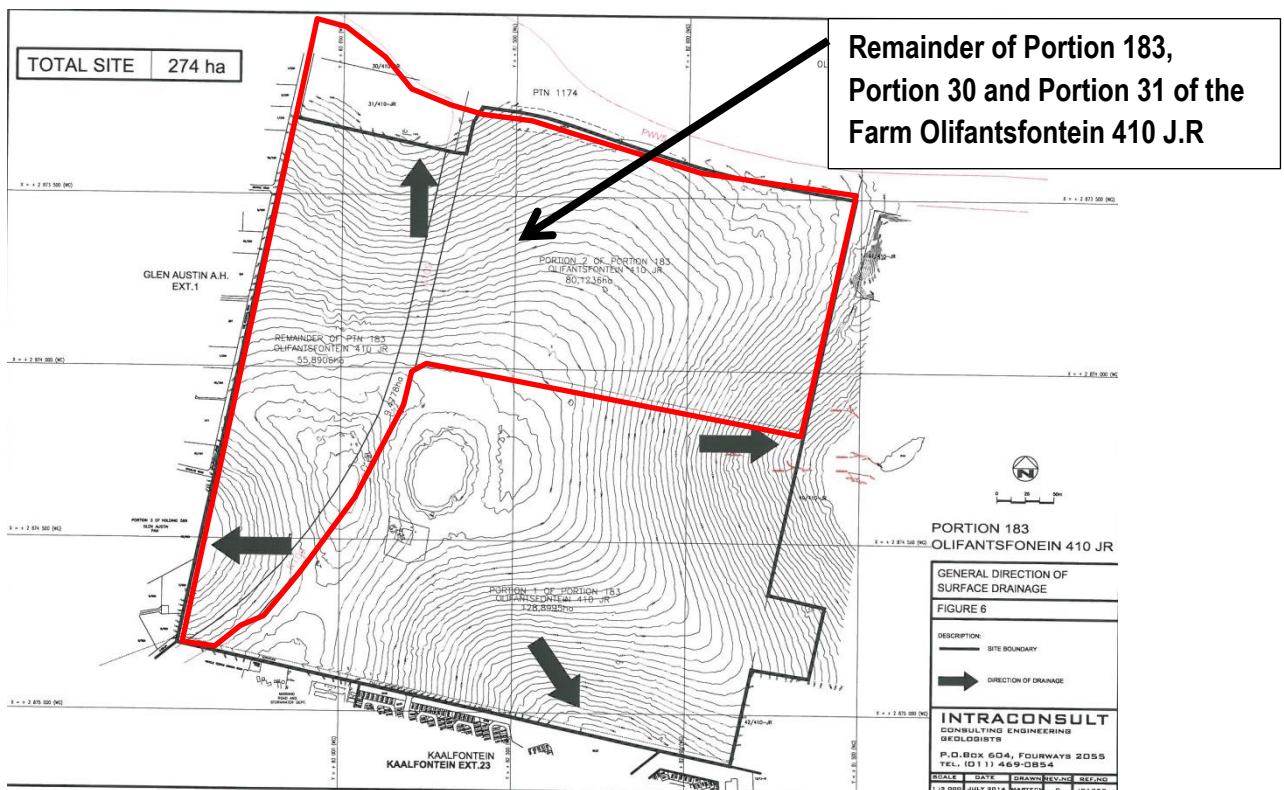


Figure 10: General direction of surface drainage

Implications:

The topographical character of the site will not result in major implications for slope stability on the proposed development.

Careful storm water management will be required across this site in order to remove storm water in a speedy and efficient manner and to prevent any accumulation of surface water against or near buildings.

Special care will be required for the design (and drainage) of services in close proximity to any of the existing natural drainage paths that occupy sectors of this site, as spring/seepage conditions may be expected to occur in such locations during periods of heavy or continuous rain.

9.4 CLIMATIC CONDITIONS

Rainfall can be expected throughout the year, but this is mainly a summer rainfall region. Thunderstorms occur frequently in summer, especially in the afternoons. The mean monthly precipitation is 56 mm/month and an average annual precipitation of approximately 623 mm.

It is a fairly dry area with a mean monthly potential evapotranspiration (PET) of 120 mm/month with the highest occurring during the summer months.

Hail can occur and is to be expected in the spring months.

The daily maximum temperatures are 28.5°C, averaging out to 18°C per day throughout the year. The highest temperatures occur during the summer months in December and January.

Frost may occur from as early as May to as late as August. The mean day length is 12 hours.

Wind speeds can reach a mean of 8.3 km/h. The most intense wind occurs during spring.

A mean water vapour pressure of 12hPa can be expected, the highest occurring during late spring and summer. In combination with the wind speed this determines the evaporation rate.

Implications:

No specific development implications have been identified.

9.5 GEOTECHNICAL INVESTIGATION

For full details, please refer to **Annexure B** for the Report on the Geotechnical report has been compiled by *Intraconsult CC*

9.5.1 Methodology

The Geotechnical Report presents and comments on the results and observations of geotechnical investigations carried out for the site known as Portion 183 Olifantsfontein 410 J.R (now subdivided and known as the Remainder of Portion 183 Olifantsfontein 410 J.R and Portion 207 (a portion of portion 183) of the Farm Olifantsfontein J.R)

These investigations have involved the review and analysis of the available data as follows:

- Trial hole profiles
- Laboratory Test Data
- Geological Map issued by the Director of Geological Survey: 2526 and 2528 (Scale 1:250 000).
- Various google images of the site
- Guidelines for engineering geological investigation on non-dolomitic areas for the purpose of township development – TPA Department of Local Government
- Home Builders Manual February 1999. National Home Builders Registration Council (NHBRC).
- National Department of Housing Generic Spec. GFSH-2Sept. 2002
- Contoured drawing

A series of soil profiles, together with soil samples for laboratory testing, have been taken from the trial holes opened across the site in general accordance with the GFSH-2 Phase 1 requirements.

Trial Holes were opened across the site using a 75 kw TLB/backhole machine. Each trial hole was entered and inspected by a geospecialist who also described the soil profiles using the visual tactile procedures advocated by Jennings et al (1973).

Particle size distributions and Atterberg limit tests have been carried out on disturbed samples recovered from the various soil units uncovered during these investigations for accurate classification and identification purposes. Soil unit samples were also selected and tested for moisture content and soil chemistry.

9.5.2 General geology

The site is underlain by granite-gneiss bedrock of the Johannesburg-Pretoria granite inlier. The residual soils of these Basement Complex granites are typically silty and clayey sands and sandy silts frequently open-textured and having collapse potential: Sub-angular joint blocks and weathered core-stores are also a common feature in Basement Complex granites.

The surficial colluvial materials contain thin horizons of hardpan ferricrete. Degrees of ferruginisation are also present in the underlying residual silty and clayey sands that originate from decomposition of the granite-gneiss bedrock. Extensive areas of rock sub outcrop, a characteristic of the bedrock underlying the site.

9.5.2.1 Geotechnical Evaluations

- Evaluation of the Collapse Potential of soils within 1.0m from natural ground level:
Significant “collapse” settlement should be anticipated in the soil profiles on the site based on the field assessments and also the laboratory oedometer test results.
- Evaluation of the activity (heave/shrink) of soils within 3.0m from natural ground level:
Analyses carried out on disturbed samples of the soils types uncovered in the trial holes confirm “normal” (H) potential heave/shrink soil conditions.

- Evaluation of the potentially compressible soils within 1.0m from natural ground surface:
Oedometer grained and low permeability soil units indicate that compressibility is unlikely to be problematic on the site once the “collapse” potential has been removed.
- Evaluation of potential aggressiveness of interparticulate groundwaters:
The results indicate that the near-surface soils do not have a tendency to be corrosive to any ferrous materials placed in them.
- Illegal dumping of refuse:
Dumped refuse and unconsolidated fill should be anticipated as a general hazard potentially influencing housing foundations.
- Evaluation of perched and seepage groundwater conditions noted in open trial holes:
Perched groundwater conditions can occur on the pedocrete/ferricrete horizons and also on shallow bedrock. Such soil profiles could be impacted by “rising damp” in services, in general, special attention to membrane/dampcourse measures is required when building the site.

9.5.2.2 *Slope stability and Erosion*

With an approximate average site gradient of around 5 – 12 percent, slope stability should not present a major problem with regard to erven development on this site. However, the fine nature of many of the soil types that will be exposed after the removal of the natural vegetation cover will present a potential erosion problem during periods of heavy rain and also dust removal by high winds in the dry season.

9.5.2.3 *Excavation Classification with respect to Services*

Many of the opened trial holes uncovered boulder “intermediate” and “hard rock” excavation materials (SABS 1200D) in the lower sections of the ground surface to minus 1.5m profile. The evaluation is that such materials generally could be removed by a more powerful (tracked) type of excavator (more locally) with the use of explosives before removal by a machine capable of removing the loosened material.

9.5.2.4 *Drainage*

Signs of potential seepage and perched water tables were noted in many of the opened trial holes and are probably associated with the impermeable nature of the underlying pedocrete soils and bedrock across the site.

The subsurface profile typically consists of a thin horizon of hillwash, overlying hardpan ferricrete grading into soft and hard rock granite.

During the rainy season ground water accumulation and lateral seepage occurs within the soils horizons, on the soil ferricrete/granite interface. This water gathers upslope of the seepage zone and migrates downslope until it is forced to “daylight” by the outcropping or dramatic shallowing of the granite or ferricrete.

It is the opinion of the Geotechnical Engineer that these sub-areas can be developed from a geotechnical perspective provided that the following precautionary measures are implemented:

- Use of cutoff drains topographically immediately above the delineated area and also the side drains in appropriately designed roads networks.
- Subsurface drains located strategically to capture the groundwater seepage e.g. below the sewer pipeline in sewer trenches. These drains could remove the water and discharge it downslope possibly into road side drains.
- All structures and walls will need to have adequate freeboard and appropriate damp proofing, to preclude rising damp.

9.5.2.5 Geotechnical sub-areas

The site area was delineated into broad sub-areas.

These Sub Areas are shown on the Soil Map in **Figure 11** below:

- Sub-area “3” is considered to be undevelopable
- Sub-areas “2”
 - 2/3W: Pan and potential seepage zones requiring special treatment/rehabilitation measures
 - 2/3E: mantled by solid and organic waste materials (requiring removal prior to development)

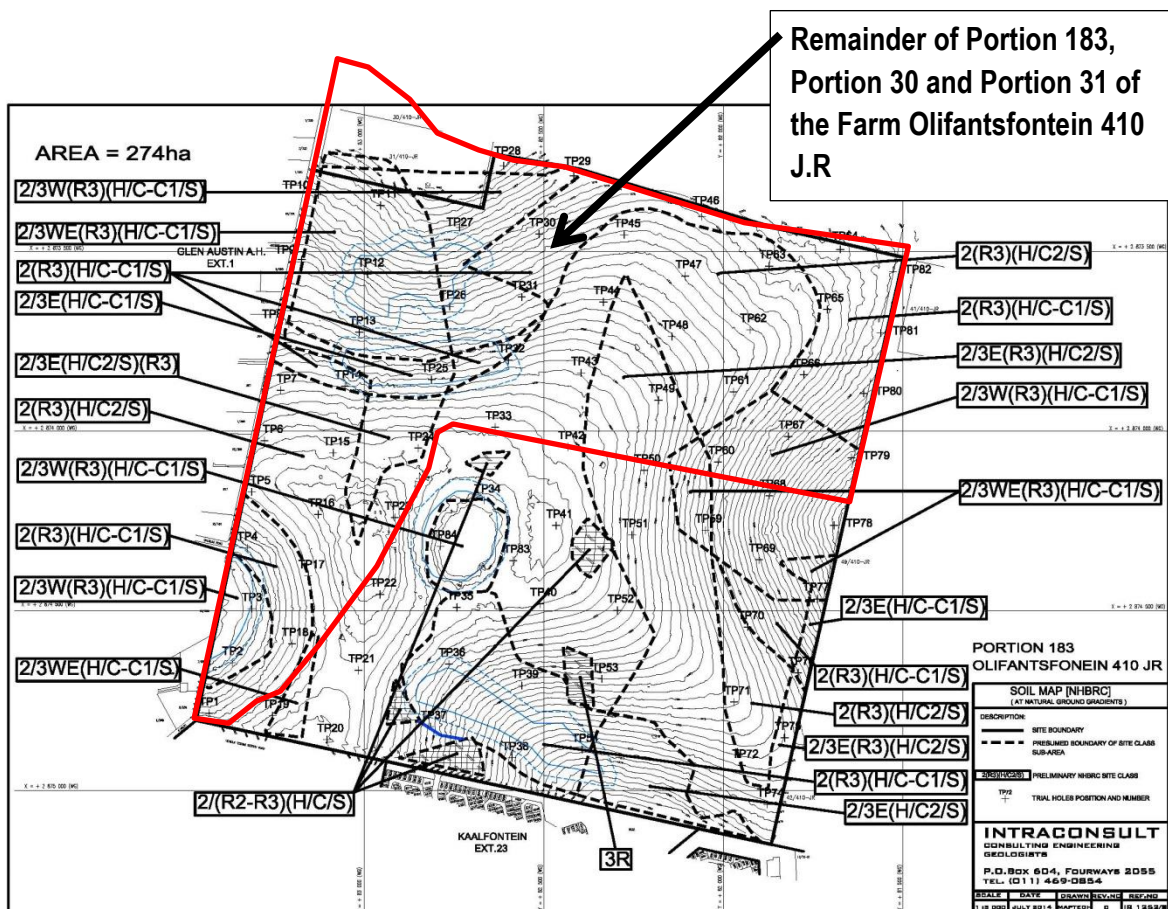


Figure 11: Soil map indication geotechnical subareas

Implications

No adverse conditions prohibiting the construction of structures for the mixed use development were observed over the bulk of the site. From a geotechnical perspective, the site is considered economically and practically developable provided that the recommendations given for the individual zones are adhered to.

The geotechnical investigation however also confirmed that potentially problematic soils mantle the bedrocks over the site area. Possible foundation solutions are further complicated by the possible presence of “hard” and “soft” materials immediately beneath individual footprints as a consequence of local rock sub outcrop. It is recommended that all soils are pre compacted below foundation works.

Recommended alternate foundation design solutions for single storey masonry structures are provided in the NHBRC “Standards and Guidelines”. However as many of these erven are likely to be developed with double storey structures it is recommended that engineered rationally designed foundations are adopted on the site.

Careful stormwater management will be required across this entire site in order to remove stormwater in a speedy and efficient manner and to prevent any accumulation of surface water against or near buildings.

Special care will be required for the design (and drainage) of services in close proximity to any of the existing natural drainage paths that occupy sectors of this site as sprint/seepage conditions may be expected to occur in such locations during periods of heavy or continuous rain.

Provision should be made to remove the areas of unconsolidated solid and organic waste fill uncovered during the geotechnical investigations.

Most sections of the site are underlain by soils with a general assessment of “fair” to “good as natural sub-grade materials. “intermediate” excavation (SABS 1200D) conditions should be anticipated in sections of the site as well as some degree of hard rock where outcrop conditions exist.

Certification of structures’ foundations by a competent geotechnical professional is required once buildings are under construction before the NHBRC will issue completion certificates.

All foundations should be inspected by a competent person to ensure that the desired founding medium has been attained and that recommendations made in the Geotechnical report have been adhered to.

9.6 AGRICULTURAL POTENTIAL

According to the Gauteng Agricultural Potential Atlas (GAPA Version 3), the site of the proposed development is classified as having a moderate agricultural potential.

An Agricultural Potential Assessment was carried out by *Index* for the proposed site. The Agricultural Potential Assessment is attached hereto under **Annexure C**.

The average yield of boreholes is estimated at 0,5 to 2,0 lt per second. The normal expected borehole yield is not sufficient for irrigated crop production. The total dissolved solids are expected to be between 200 and 600 mg/kg. The levels where crops and animals start being influenced are at 1 200 and 4 000 mg/l respectively. There is no surface water available on the property.

The area is mainly grassland with small portions encroached with black wattle. Most land on the farm is natural or disturbed veld with a grazing capacity of 6 hectares per large stock unit. Taking the quarry and eroded areas into consideration the farm can accommodate approximately 40 LSU's. According to NDA criteria, a viable farm should be able to carry at least 60.

The property is underlain by granite and gneiss, a rock that generally weathers into shallow coarse-grained sandy soils.

Five soil types were found, (1) deep and moderately deep red soils classified as Hutton, (2) moderately deep yellow and greyish brown colour soils classified as Avalon, (3) shallow greyish brown soils on partially weathered granite, classified as Glenrosa, (4) deep, dark waterlogged soil along the river classified as Longlands and Escourt; and (5) excavations.

A detailed soil and land analysis found that none of the soil types found can be described as high or medium potential.

Agricultural potential assumes that the property would sustain the commercial farmer and that the net farm income is positive. The following were found:

- Most crops fail to yield a positive margin.
- The preferred land use would be livestock, which can provide the farmer with a gross farming income of R143 076 before overheads and repayment of land. This is not sufficient to cover overheads or repay a bond if the land had to be bought. A farming loss of R57 648 is projected if this was a farming unit.

No land is presently under irrigation, there is also no water available.

The property has only 21 hectare medium to high potential soil. Further, no land was found to be high potential for rainfed

cropping according to the departmental guidelines.

The site is suitable for livestock, but the income that can be derived from the number of cattle that the property can keep,

is not high enough to cover overhead costs if the farm was managed as a financial venture.

In conclusion, the property is not a viable farming unit.

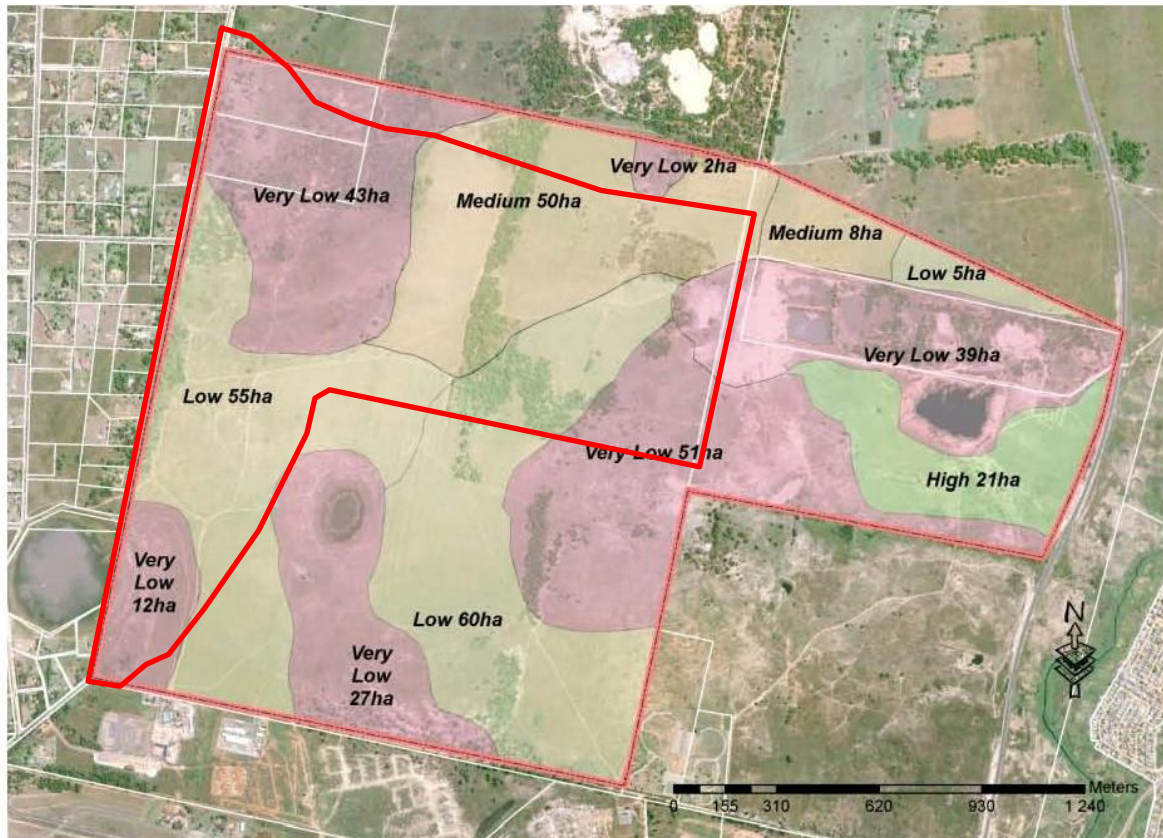


Figure 12: Agricultural potential

9.6.1 Implications

No land is presently under irrigation, there is also no water available.

The property has only 21 hectare medium to high potential soil. Further, no land was found to be high potential for rainfed cropping according to the departmental guidelines.

The site is suitable for livestock, but the income that can be derived from the number of cattle that the property can keep, is not high enough to cover overhead costs if the farm was managed as a financial venture.

In conclusion, the property is not a viable farming unit.

Therefore no additional impacts of the proposed development are anticipated in terms of agricultural potential.

9.7 ECOLOGICAL ASSESSMENT

Please refer to the **Vegetation Assessment** as completed by *Eco-Agent CC* and is attached hereto under **Annexure D**

The ecological assessment studies were undertaken to determine the overall condition and ecological status of the proposed development site, as well as the occurrences (and possible potential habitat) of any RDL floral species. The findings of these studies should be used to propose recommendations and mitigation actions for the construction and management phases of the proposed development activity pertaining to various ecological processes, as well as to develop an Environmental Management Plan (EMP).

A desktop study to gain background information on the physical habitat and potential floral biodiversity lists of the proposed development site and surrounding areas was initially undertaken. These lists included the RDL species applicable to the area and a description of the physical habitat and vegetation types represented within the area. This information was then cross-referenced with the data from the habitat assessments done during the field survey. The field surveys for the Vegetation assessment were undertaken during March 2009. A letter from Prof. George Bredenkamp confirming that the conditions on site are still the same is attached to the Vegetation Assessment.

9.7.1 Results of Vegetation Assessment

The site is situated in the Bankenveld Veld Type as described by Acocks (1988). Low & Rebelo described the vegetation of the area also as Rocky Highveld Grassland. In the new vegetation map of South Africa (Mucina & Rutherford. 2006) the area falls within the Egoli Granite Grassland.

The area is topographically a uniform, slightly sloped plain, mostly covered with old fields, planted pasture, secondary Anthropogenic grassland and wattle plantations. .

Due to decades of habitation, the natural vegetation was long ago transformed into agricultural fields now replaced by secondary grassland, wattle plantations and sand and granite mining activities. Other relevant studies in the area include those of Bredenkamp & Brown (2003), Bredenkamp et al. (2006) and Grobler et al. (2006).

The following vegetation units were identified on the site:

1. Old Fields & *Eragrostis* Planted Pasture (low sensitivity)
2. Secondary Anthropogenic *Hyparrhenia* Grassland (low sensitivity)
3. Transformed Secondary Grassland (low sensitivity)
4. Extremely disturbed areas (low sensitivity)
5. Alien Plantations (low sensitivity)
- 6a. Pan Wetland (high sensitivity)
- 6b. *Eragrostis* Wetland Fringe (high sensitivity)
- 6c. *Stoebe* Disturbed Pan Area (high sensitivity)
7. Old Mining Area (low sensitivity)
8. Spruit (high sensitivity)

9.7.1.1 Vegetation Units determined as part of the Vegetation Assessment

9.7.1.1.1 Old Fields & *Eragrostis* Planted Pasture

These areas were old fields long ago, but since *Eragrostis* planted pastures have been established. The general impression of the vegetation of these areas is that it is quite disturbed, with *Eragrostis curvula* dominant. The tall growing anthropogenic grass *Hyparrhenia hirta* is mostly not present but locally in isolated patches it may be present. Weedy species are found throughout the unit. Most of this area is very low in species richness.

This area has no conservation value, low sensitivity. No signs of the original grassland are present and the proposed development can be supported.

9.7.1.1.2 Secondary Anthropogenic *Hyparrhenia* Grassland

These areas were old fields long ago, or areas where sand was stripped from the surface for sand mining. The general impression of the vegetation of these areas is that it is quite disturbed, with *Hyparrhenia hirta* dominant while *Eragrostis curvula*, *Eragrostis chloromelas*, *Eragrostis plana*, *Cynodon dactylon* and *Aristida congesta* are mostly present. Weedy species are found throughout the unit. Most of this area is very low in species richness. Some road tracks transect the area, here weeds are more prominent.

The area is dominated by tall grass with most herbaceous species present being weeds. This area has no conservation value, low sensitivity. No signs of the original grassland are present and the proposed development can be supported.

9.7.1.1.3 Transformed Secondary Grassland

These areas were where sand was stripped from the surface for sand mining, or other areas where there had been a severe impact on the natural vegetation. The general impression of the vegetation of these areas is that it is very degraded, rather seen as transformed, with *Hyparrhenia hirta* dominant while weedy species are found throughout the unit. Most of this area is very low in species richness

The area is totally disturbed and transformed, but often dominated by tall grass and with most herbaceous species present being weeds. This area has no conservation value, low sensitivity. No signs of the original grassland are present and the proposed development can be supported.

9.7.1.1.4 Extremely Disturbed Areas

These areas were where sand was stripped from the surface for sand mining, or other areas where there had been a severe impact on the natural vegetation.

The general impression of the vegetation of these areas is that it is very degraded, rather seen as transformed, with *Hyparrhenia hirta* dominant while weedy species are found throughout the unit. Most of this area is very low in species richness.

The area is severely disturbed and transformed, with mainly bare soil but patches may be dominated by tall grass and with most herbaceous species present being weeds. This area has no conservation value, low sensitivity. No signs of the original grassland are present and the proposed development can be supported.

9.7.1.1.5 Alien Plantations

Several patches of Wattle plantations, or old plantations, or Wattle encroachment are found scattered over the site. Locally, where there were old residences, now only ruins, some other alien trees are also present. The general impression of the original vegetation of these areas is totally transformed, with almost no undergrowth remaining under the wattle trees.

The area is severely disturbed and transformed, with mainly wattle trees and with most herbaceous species present being weeds. This area has no conservation value, low sensitivity. No signs of the original grassland are present and the proposed development can be supported.

9.7.1.1.6 Pans and wetland areas (Pan wetland, *Eragrostis Wetland* and *Stoebe* Disturbed Pan Area)

Two pans are situated in the area. The one is located within the site, the other is actually outside the site, but a small portion is inside the far south-western corner. The pans have 2-3 zones, namely:

6a - the wet core area with hygrophilous species,

6b - a fringe area with *Eragrostis plana* and

6c - the outside rim which is the result of mining and this area is highly disturbed, dominated by *Stoebe vulgaris*.

This entire pan area, including all the zones, is considered to be ecologically sensitive, and will be described as a whole..

The pan areas are ecologically sensitive and should be protected. It is suggested that the pans and a 32 m buffer zone from the outer edge of the pans be protected from any developments and incorporated as green belt in the development plan. This is in accordance with the GDARD and DWS policies.

9.7.1.1.7 Old Mining Area

This old mining area is totally disturbed and transformed. Two large dams, old quarrie areas, are present in this unit. The natural vegetation in the area has been replaced and mostly alien tree species occur here. Wattle is dominant. On the water fringe is reed (*Phragmites australis*) very prominent. Other prominent species include *Cortaderia seloana*. The general impression of the vegetation of these areas is that it is very degraded, rather seen as transformed, with Wattle dominant while weedy species are found throughout the unit. Most of this area is very low in species richness.

9.7.1.1.8 Spruit

The spruit is located on the southern boundary with the area where development has been approved (the Remainder Portion). The spruit is mostly in the Remainder Portion located south of the site investigated and reported on in this report. However, a small part of the spruit forming the catchment area, and also a small dam in the spruit falls within the current site. This area forms a moist grassland in the catchment and a wetland at and below the small dam. In the catchment are several *Eucalyptus* trees and at the dam is also a few alien trees, but no indigenous woody riparian vegetation is present.

Below the dam the wetland is covered with reeds (*Phragmites australis*), but this merges into the adjacent southern property.

The spruit area is ecologically sensitive and should be protected. It is suggested that the a 32 m buffer zone from the outer edge of the spruit (or the 1 in 100 year flood line, whichever is the greater) be protected from any developments and incorporated as green belt in the development plan. This includes the catchment area. This is in accordance with the GDARD and DWS policies.

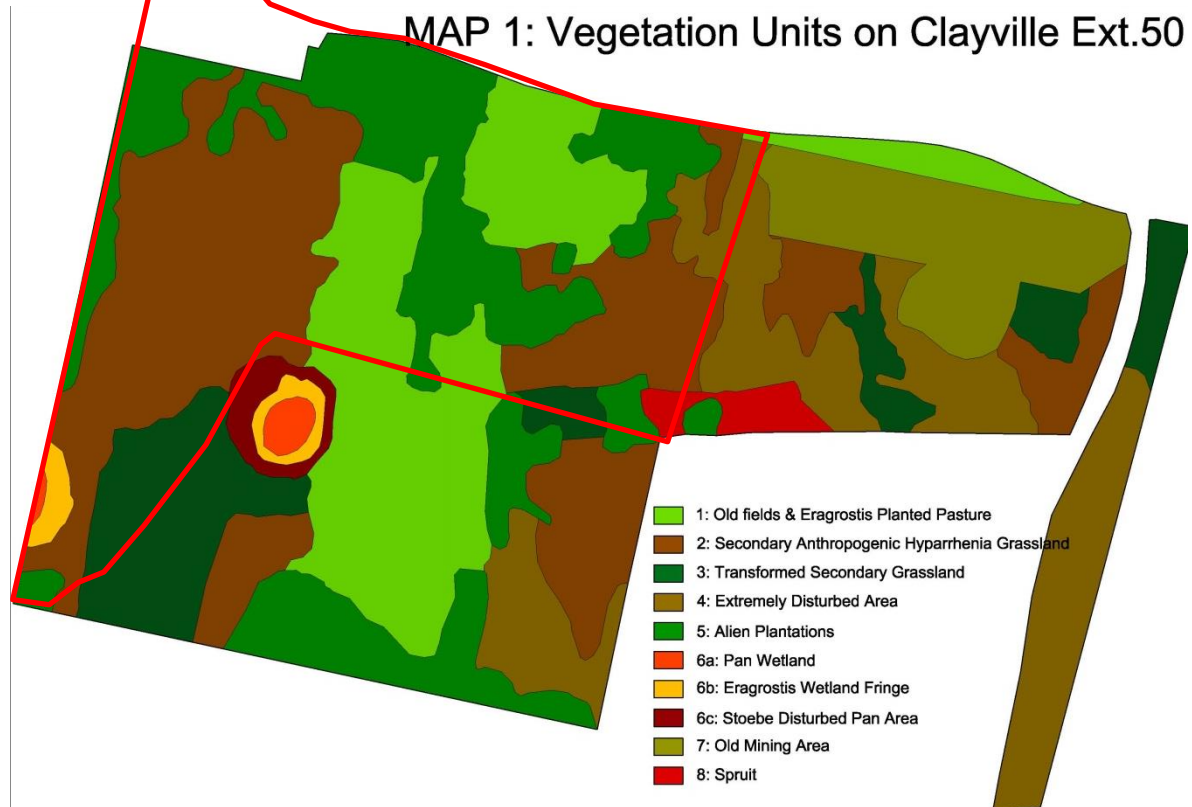


Figure 13: Vegetation Units on Clayville X50

9.7.1.2 Red Data Species

An assessment considering the presence of any floral species of concern, as well as suitable habitat to support such species, was undertaken.

No red data plant species occur on this site

9.7.1.3 Implications

The following applies:

- There are no ridges on the site.
- The site does not fall within a conservancy.
- The site does not fall within a protected area.
- The site does fall within a dolomite area.
- There are wetland areas on the site, mainly a pan and man-made quarries, and a small portion of a stream
- There are no sensitive terrestrial areas on the site.

Apart from the pans and the spruit, the entire site is highly disturbed or transformed. It is suggested that the development can be supported, provided that the pans and spruit be protected in green areas within the development plan.

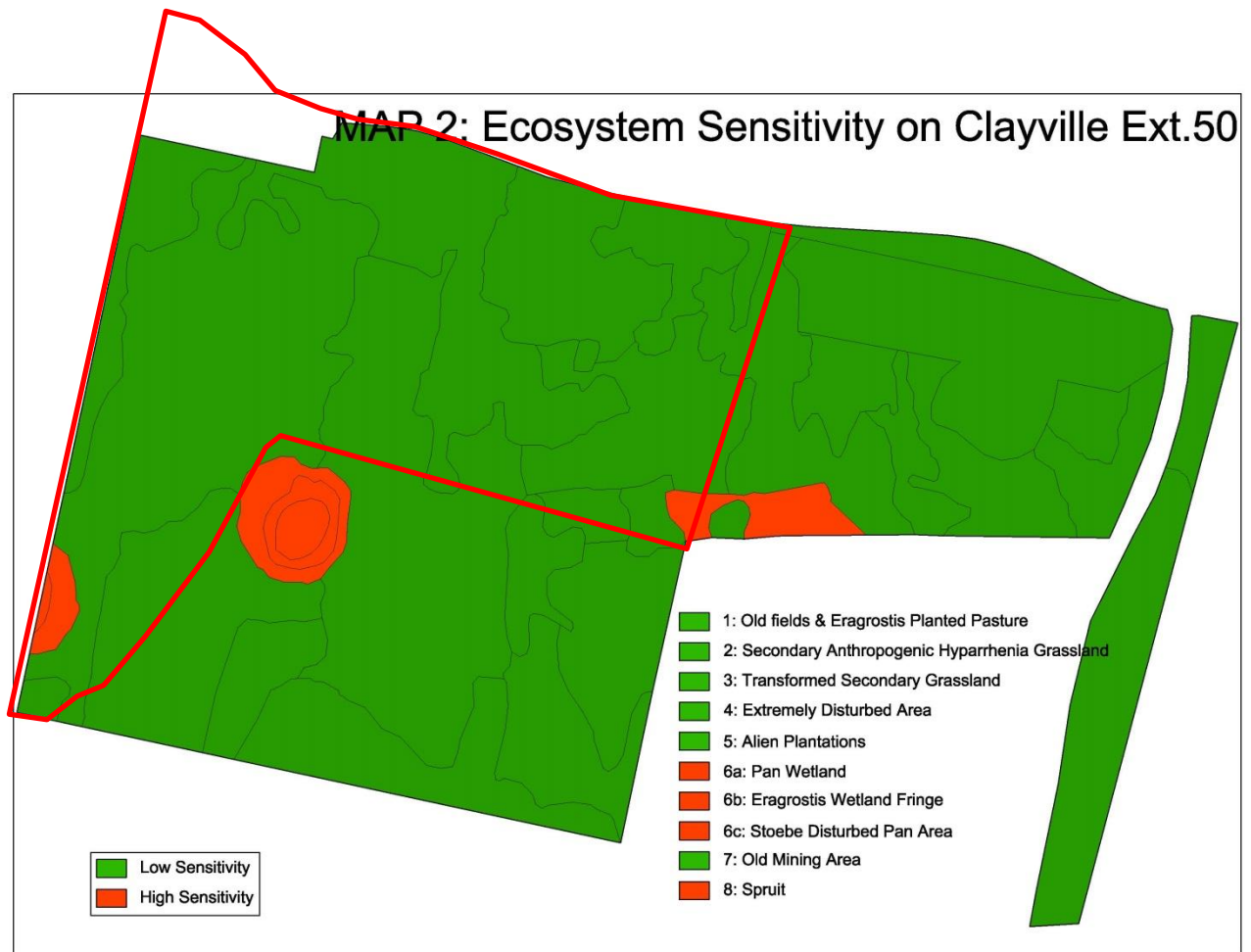


Figure 14: Ecosystem Sensitivity map

9.7.2 Fauna

The majority of the study area has undergone transformation due to the historic and on-going anthropogenic activities within the study area as well as immediate surroundings. This has led to the reduction of viable faunal habitat for indigenous species, resulting in only species, which have adapted to cohabitate with humans or be tolerant of habitats affected by anthropogenic disturbance presently expected within the study area.

Due to the location of the study area as well as the current habitat conditions no SCC (Species of Conservation Concern) are expected to inhabit the study area. However the presence of the Giant Bullfrogs *Pyxicephalus adspersus* was confirmed. According to the IUCN Red List the Giant bullfrog is listed as least concern. However an amphibian assessment was completed.

9.7.3 Amphibian assessment

Please refer to the **Amphibian Habitat Assessment** as completed by *VC Management Services* and is attached hereto under **Annexure E**

The proposed site includes the habitat for the Giant Bullfrogs *Pyxicephalus adspersus*.

Surrounding land use includes industry to the south, fragmented small holdings to the west open areas to the north and townships on the east.

The assessment completed by VC Management Services assessed the potential impact of the proposed development on amphibians, especially Giant Bullfrogs and made recommendations for the mitigation of the impacts.

The proposed route for the K109 route passes through the site. The impact of the road on the Giant Bullfrog population would be considerable and is also considered.

9.7.3.1 *Principles considered in the Giant Bullfrog Assessment*

- Principle of social need – housing and economic development is imperative
- Principle of ecological process – conserving ecosystems is more important than single species but the latter are indicators of healthy systems.
- Principle of landscape assessment

9.7.3.2 *Methods used*

- Desk research
- Site visits
- Consultation with experts, officials and interested parties.
- Assessment of alternative mitigating strategies in terms of how well each one meets a set of four criteria
 - Long-term viability of the Giant Bullfrog Population at Glen Austin
 - Functionality of the wetland systems and wetland services on the site.
 - Overall financial, social and economic value of the development
 - Considerations beyond the boundaries of the site.

9.7.3.3 *Findings*

Glen Austin is an important bird and Giant Bullfrog site and is subjected to special regulations.

Giant Bullfrogs require four types of specialized habitat in order to survive, namely breeding sites, burrowing soils, foraging grounds and dispersal corridors. The study site currently provides all four of these habitats.

9.7.3.4 *Impacts*

The proposed development will have the following impacts if no mitigation steps are taken:

- Breeding sites will be disturbed / damaged
- Foraging grounds and burrowing habitats will be reduced
- Road kills and general disturbance will reduce Giant Bullfrog population will be confined to a genetically isolated “island” surrounded by impenetrable development.
- Excavation will damage the perched water table and wetland seepage system.

9.7.3.5 K109

The impact of the K109 road would be considerable. No mitigating action by the Clayville X50 project will be adequate in the long term if the K109 is authorised in its proposed form. However the road is not part of the Clayville Ext 50 application and the developers are not in a position to implement recommendations made in the Amphibian Assessment regarding the road.

The application for Environmental Authorisation in respect of the K109 road is currently being undertaken by Lokisa Environmental Consulting (Ref: GAUT: 002/14-15/0243). Refer to **Figure 15** below for the proposed locality map as provided by Lokisa Environmental Consulting and Refer to **Figure 16** for the Gautrans Masterplan in respect of the K109 and PWV5.13.

The K109 road will be 4.9km in length with a reserve of 48.4 metres. The construction involves the upgrading of a portion of Dale Road to K route standards. The rest of the road traverses open ground until it joins Road K127.

The design will be done as a Dual Carriageway though only one carriageway will be constructed. The Gauteng Department of Roads and Transport has not indicated when the other carriageway will be built.

The K109 forms part of the Gauteng Department of Roads and Transport's future road network planning aimed to enhance connectivity within the province and to other provinces. The route alignment for this road is fixed. No location alternative for this development was considered

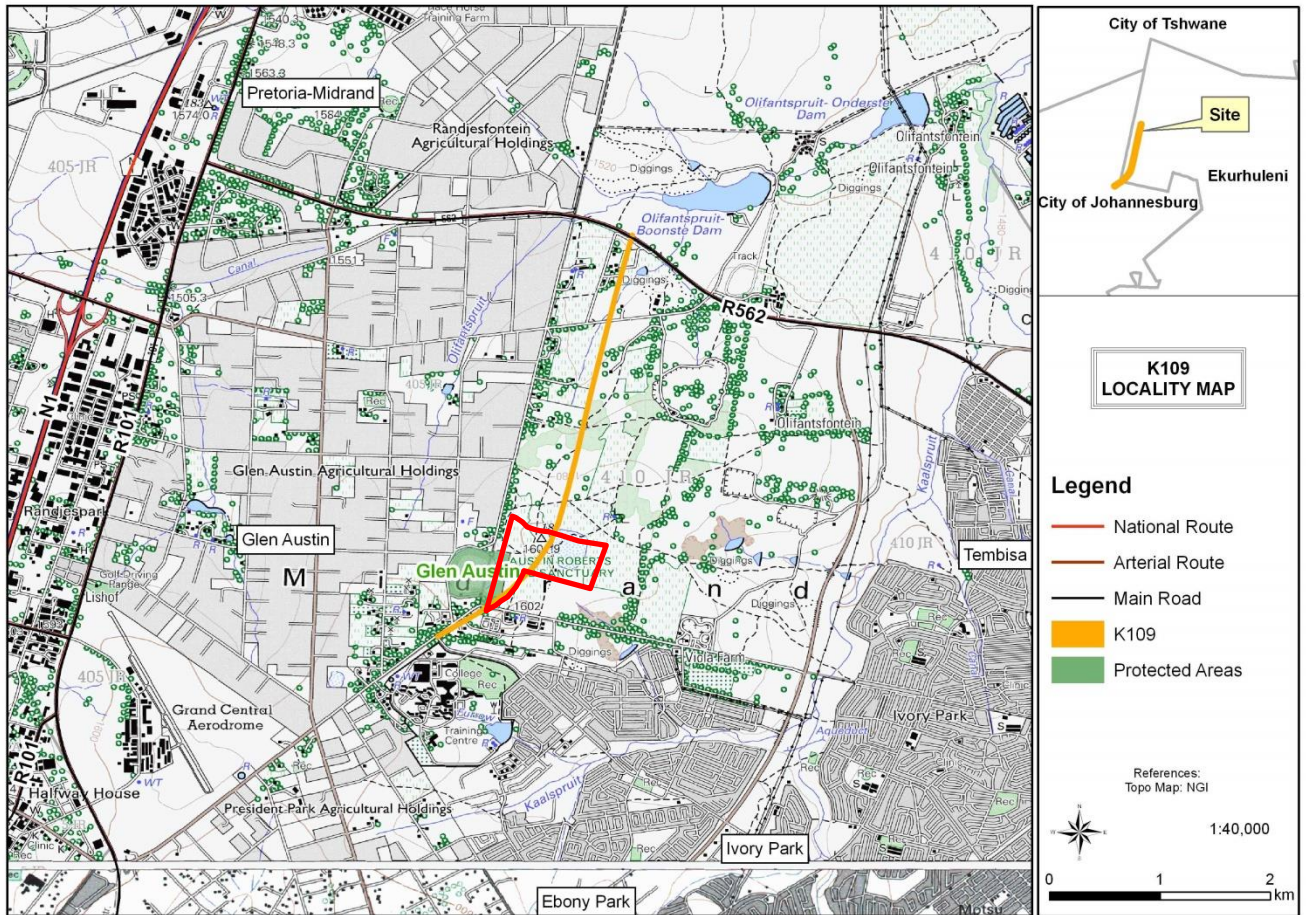


Figure 15: Proposed locality of K109 from Lokisa Environmental Services

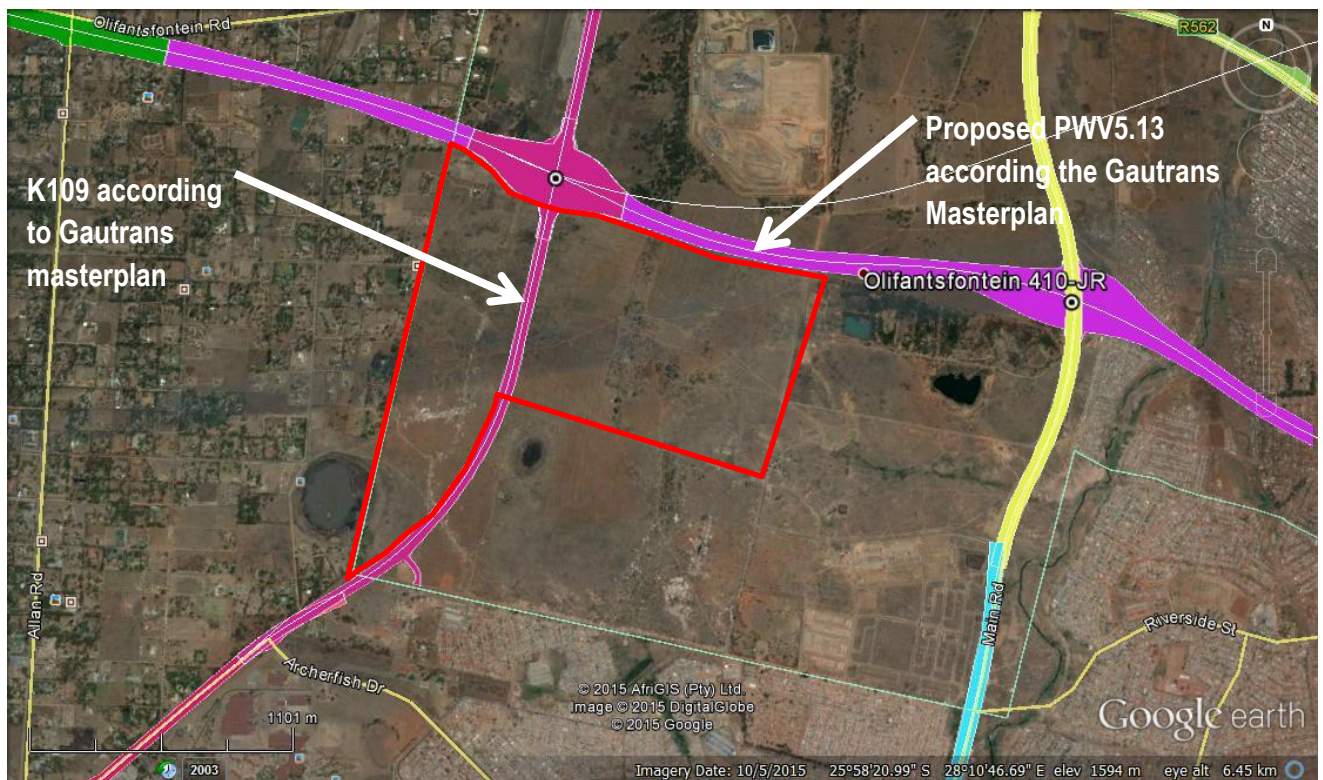


Figure 16: Gautrans roads masterplan in respect of the Clayville X50 site

9.7.3.6 Alternative strategies

9.7.3.6.1 Alternative 1 – No Go – Not recommended

Withholding environmental authorization for the proposed development would meet some short-term ecological criteria but none of the social-economic criteria. If the K109 is authorized then a no go decision on Clayville Ext 50 offers no advantages at all.

9.7.3.6.2 Alternative 2 – 1000m buffer – Not recommended

The buffer zone prescribed by GDARD would leave an isolated population on about 80 hectares surrounded by development and not a sustainable, long term system. The K109 would reduce the effective buffer to a 36 hectare area with access to the breeding site.

9.7.3.6.3 Alternative 3 – Translocation of specimens to an alternative site – Not recommended

Translocation usually fails because a) Giant Bullfrogs are strongly philopatric, b) moving tadpoles merely increases the number that will die because the resources at a site can only sustain a given population c) "new" sites not currently used are, by definition unsuitable, d) translocations increase the probability of transmitting disease and disrupting natural gene dispersal processes e) capturing techniques rarely, if ever, gather more than a fraction of the population

9.7.3.6.4 Alternative 4 – Preferred Alternative – Use of the K109 to delineate a buffer and dispersal corridor – Preferred alternative as a compromise if the K109 is constructed. As indicated above the construction of the K109 is currently in planning phase, application for environmental authorisation is being undertaken by Lokisa Environmental Consulting (Ref: GAUT: 002/14-15/0243).

A narrow, buffer zone and corridor delineated by the alignment of the road would probably allow about 50% of the population to survive.

Private open space areas are provided by the proposed development that connects to larger biodiversity corridors in the area. However as part of the construction of the K109 Road measures, For example large culverts which provide enough space for the Giant bullfrogs and other small faunal species, must be implemented by Gautrans and its contractors to ensure connectivity and allow movement to these areas beneath the road. Refer to **Figure 17** below, which indicates the open space areas provided as part of the proposed development.

9.7.3.6.5 Alternative 5 – Combined buffer and corridors with a re-aligned K109 – Not practical

Re-alignment of the K109 to allow buffer zones and corridors to be interlinked with wetland across the development would provide adequate habitat for the long-term survival of ecological systems and the Giant Bullfrog population. However as indicated above the road alignment is fixed and that no other alternative routes are considered.

Implications

- Ample private space is provided as part of the proposed development,

- Construction should be limited to the dry seasons as far as possible, with silt fencing and sediment traps being implemented to negate the impact of soil erosion and sub-sequential siltation of the associated aquatic habitats
- The proposed development activities, if undertaken in an environmentally responsible manner and the proposed ecological sensitivity map is adhered to, is perceived to have an insignificant effect on the overall conservation of species within the region.

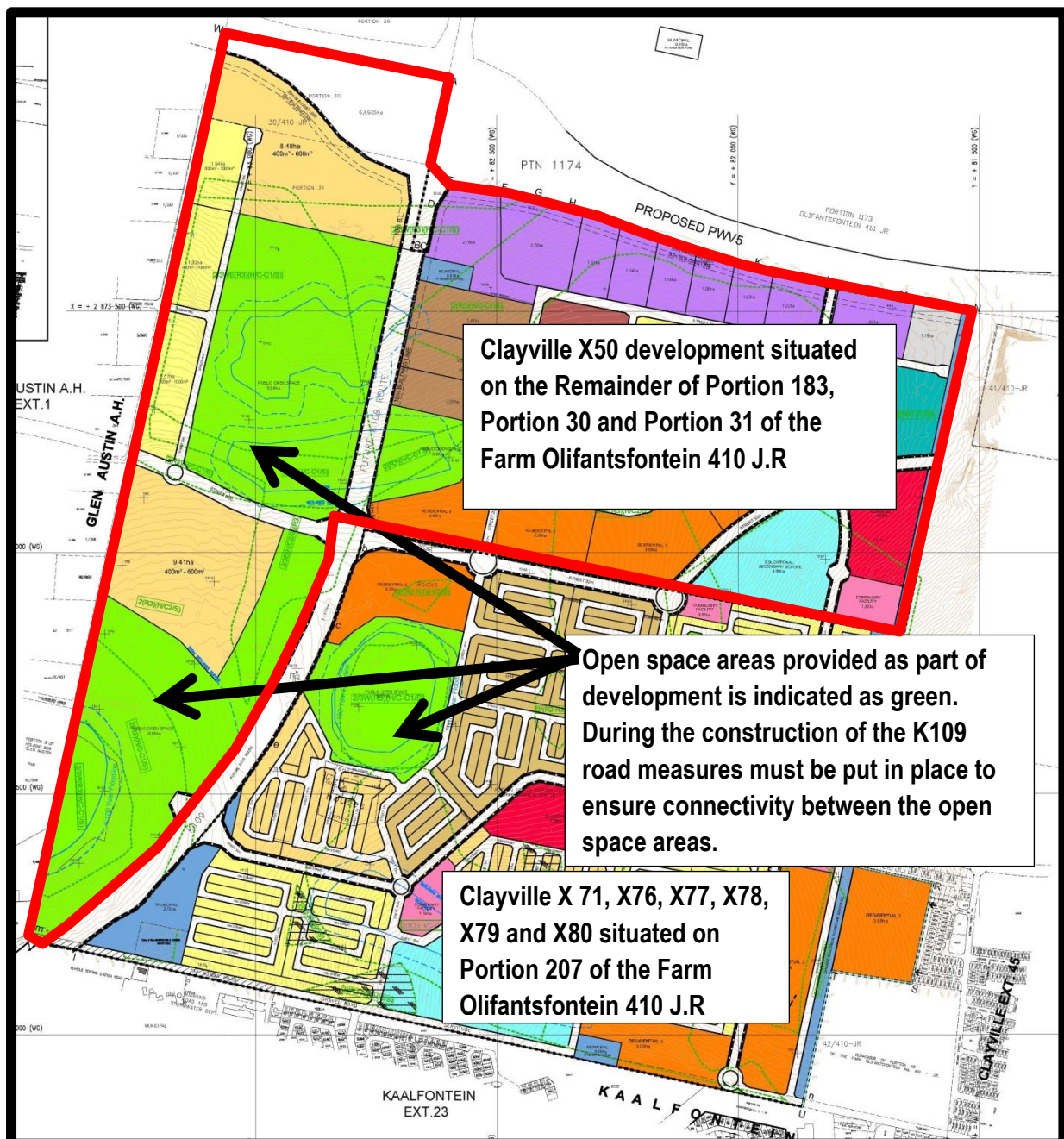


Figure 17: Open space areas allocated to the proposed Clayville X50 development situated on the Remainder of Portion 183, Portion 30 and Portion 31 of the Farm Olifantsfontein 410 J.R as well as open space provided on Clayville X 71, X76, X77, X78, X79 and X80 situated on Portion 207 of the Farm Olifantsfontein 410 J.R

9.7.3.6.6 Methods to ensure connectivity to biodiversity corridors

Culverts at least 500mm high and 500mm wide must be installed underneath roads crossing the biodiversity corridors to serve as migration tunnels for giant bullfrogs and other small faunal species.

Along the K109 where the road crossing the open space area is wide grates allowing light to pass through must be placed in the median between the lanes and culverts to ensure that enough light is provided.

This must be completed in conjunction with an amphibian specialist and the Gauteng Department of Agriculture and Rural Development during the construction phase.



Figure 18: Examples of culverts to allow amphibians and small faunal species to cross roads

9.7.4 Wetland / Riparian Delineation and Functional Assessment

Please refer to the **Wetland Delineation and Assessment** as completed by *Wetland Consulting Services (Pty) Ltd* in 2009 and is attached hereto under **Annexure F**. The aforementioned Wetland Delineation and Assessment was verified by *Limosella Consulting* in 2014 and is attached hereto under **Annexure G**. Take note that both wetland delineations were carried out for the original Portion 183 of the Farm Olifantsfontein 410 J.R, which has now been subdivided.

9.7.4.1 Wetland Delineation and Assessment completed by Wetland Consulting Services (Pty) Ltd

9.7.4.1.1 Methodology

For the purposes of delineating wetland boundaries use is made of indirect indicators of prolonged saturation, namely wetland plants (hydrophytes and wetland soils (hydromorphic soils), with particular emphasis on hydromorphic soils where under normal conditions soils must display signs of wetlands (mottling and gleying) within 50cm of the soil surface (DWAF, 2005).

A desktop delineation of suspected wetland areas was undertaken by identifying rivers and wetness signatures from the digital base maps using geo-referenced Google Earth images. The suspected wetland boundaries were captured using heads up digitising in ArcView 3.2. All identified areas suspected to be wetland were then further investigated in the field.

For field verification the study area was sub divided into transects placed at right angles to the suspected wetlands. A hand held soil augur was used to expose soil profiles along these transects, and the wetland boundary was subsequently determined where the exposed soil profile exhibited redoximorphic features associated with wetness.

The wetlands were subsequently classified according to their hydro-geomorphic determinants based on modification of the system proposed by Brinson (1993), and modified for use locally by Marneweck and Batchelor (2002). This was subsequently revised by Kotze et al (2004). Notes were made on the levels of degradation in the wetlands based on field experience and a general understanding of the types of systems present.

The Present Ecological State assessment of the wetlands within the study area was undertaken to determine the extent of departure of the wetlands from a natural state or reference condition. For the purpose of this study, the scoring system as described in the document “Resource Directed Measures for Protection of Water Resources, Volume 4. Wetland Ecosystems” (DWAF, 1999) was applied for the determination of the PES.

9.7.4.1.2 Catchments

The study area falls within the Primary Catchment A (Limpopo River Catchment), and at a finer scale with quaternary catchment A21B which is drained by the Hennops River. The study area is the source of two tributaries that flow into the Kaalspruit. To the north, just outside the border of the study area is the source of a tributary of the Olifantsspruit, which is itself a tributary of the Kaalspruit.

9.7.4.1.3 Findings

A site visit was undertaken to verify and further define the suspected wetland areas and boundaries from the desktop analysis. The wetland and site generally have been severely locally impacted. These impacts include:

- Dumping (litter and building rubble) and infilling;
- Excavation (sand burrowing) resulting in extensive erosion and head cutting in some places;
- Encroachment of alien invasive plants;
- Sewer line inside the wetland area; and
- Road crossing, culverts and excavations resulting to extensive erosion and head cutting in some places.

A considerable portion of the study area that was provisionally mapped as possible wetland was found to consist of disturbed soils, characterised by exposed hard plinthic horizon and dominated by *Stoebe vulgaris*. These soils are very shallow and it is believed that the sandy soil layer characteristic of weathered granites has either been intentionally removed for building and construction sand, (there are a number of sand mining operations still active in the area) or has eroded leaving the plinthic horizon exposed.

Based on the impacts and land use practices, an investigation on site indicates that most of the areas mapped in the desktop delineation exercise probable were wetlands, but the lack of either an orthic and/or A horizon precludes their classification as wetlands.

The actual extent of the extant wetlands on site, based on the methods advocated by DWAF, 2005 are shown in **Figure 19** below.

Using a modification (Marneweck and Batchelor, 2002, Kotze et al, 2004), of the hydrogeomorphic classification system proposed by Brinson, 1993, three types of wetland systems were recognised on the site. These are:

- Hillslope seepage wetland
- Valley bottom wetlands
- Pans

Additional areas were mapped which consist of eroded incised streams characterised by excessive erosion. These areas have been included as it was considered that they fall within the definition of a watercourse in terms of the National Water Act.

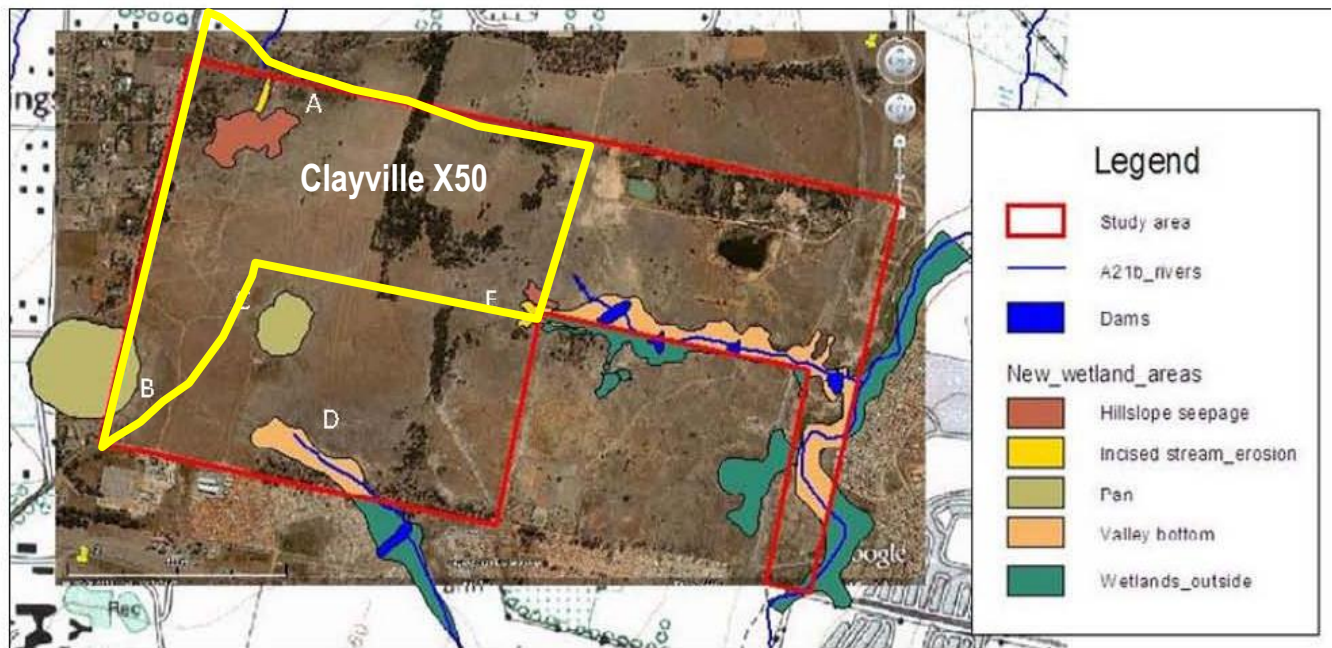


Figure 19: The extent of delineated wetland areas on site

9.7.4.1.4 Hillslope seepage wetlands

Hillslope seepage wetlands in this environment are associated with the soils derived from the weathering profile of the Halfway House Granites, the geological formation on which the site is located. The hillslope seepage wetlands on the proposed site consists of deep sandy soils with mottling and gleying depending on the wetness of the soil and shallow soils underlined by hard plinthic horizon.

The Present Ecological State PES was calculated as a C/D due to the wetlands being moderately to largely modified in some areas especially where erosion has taken place and alien vegetation invasive encroachments has occurred.

9.7.4.1.5 Valley bottom wetland

The valley bottom system is characterised by clayey soil, gleyed and dens mottling in some areas which indicated seasonal variation of the water table within this environment.

The Valley bottom wetlands were determined to be largely to seriously modified with a Present Ecological State Score of D/E, especially with the sand mining that has taken place, excessive erosion, and crossings including dumping and littering which has resulted in alien vegetation invasion.

9.7.4.1.6 Pans

Two pans were recorded on site with a portion of the Glen Austin Pan which falls within the study area. The pans were characterised by shallow sandy soil in some places underlined by plinthic horizon. The edges of the plan are disturbed including dumping and erosion and they are dominated by *Stoebe vulgaris*.

The Pans were calculated to have a Present Ecological State of B/C, Largely natural to moderately modified, especially along the edges where dumping was observed and some disturbances that has resulted in encroachment by *Stoebe vulgaris*.

9.7.4.1.7 Incised streams

The incised streams are characterised by extensive erosion, exposed hard plinthic horizon and shallow to non top soil in some areas. They are regarded as part of the watercourses on site as they form part of the broader water resources system on and around the site as they maintain connectivity amongst all water courses recorded on and around the site.

9.7.4.2 Verification of Wetland Delineation and Assessment by Limosella Consulting

9.7.4.2.1 Methodology

The delineation method documented by the Department of Water Affairs and Forestry in their document “A practical field procedure for identification and delineation of wetlands and riparian areas” (DWAF, 2005), the “Classification System for Wetlands and other Aquatic Ecosystems in South Africa” (Ollis, *et al.*, 2013) and the Minimum Requirements for Biodiversity Assessments (GDARD, 2012) was followed throughout the field survey. These guidelines describe the use of indicators to determine the outer edge of the wetland and riparian areas such as soil and vegetation forms as well as the terrain unit indicator. A hand held recreation grade gps was used to capture GPS co-ordinates in the field. Google Earth, 1:50 000 cadastral maps, historical images (1939 and 1976), and available spatial data were used as reference material for the mapping of the preliminary wetland boundaries. These were converted to digital image backdrops and delineation lines and boundaries were imposed accordingly after the field survey.

9.7.4.2.2 Results

Batchelor (2009) identified 6 wetland areas on the study site (including a small portion of Glen Austin Pan. These wetlands are labelled as A, B, C, D and E (**Figure 19** above). Fieldwork conducted in May 2014 focused on these areas to verify their current extent and Present Ecological Status.

9.7.4.2.2.1 Wetland A: Seepage

Fieldwork conducted in 2014 supported the 2009 delineation. Indicator recorded in this wetland included a typical wetland soil profile with a bleached matrix and iron precipitation in the form of orange mottling above a hard plinthic layer. The plants *Haplocarpa scaposa*, *Helichrysum nudifolium*, *Nidorella anomala* and *Burkeya radula* could be seen in this area, together with *Eragrostis gummiflua*.

Batchelor (2009) classified the Present Ecological Status of this wetland as class C/D. This remains an accurate reflection of the PES of the wetland. Impacts to this wetland remain as they were in 2009, namely, historic ploughing, draining, footpaths and grazing.

9.7.4.2.2.2 Wetland B: Glen Austin Pan

The boundaries of Glen Austin Pan remain much the same as they have historically done. This endorheic pan has clear hydrological zonation reflected in the plant species evident in aerial images

over a range of years. Glen Austin Pan is known to provide habitat for many bird species as well as a population of the Giant Bullfrog (*Pyxicephalus adspersus*),

Batchelor (2009) classified the Present Ecological Status of this wetland as class B/C. The PES status of this wetland remains unchanged.

9.7.4.2.2.3 Wetland C: Pan

Fieldwork conducted in 2014 supported the 2009 delineation. Clear hydrological zonation remains visible in the plant species occurring around the pan. This zonation has not altered since 2002 (the oldest available images available in Google Earth). Wetland plants recorded at this pan included *Andropogon eucomus*, *Aristida congesta*, *Eragrostis gummiflua*, *Eragrostis plana*, *Hyparrhenia hirta*, *Schoenoplectus corymbosus*, *Persicaria serrulata*, *Centella coriacea*, *Helichrysum nudifolium*, *Hypoxis rigidula* and various *Cyperus* species. The close proximity of Glen Austin Pan suggests that bird and frogs utilize this pan.

Batchelor (2009) classified the Present Ecological Status of this wetland as class B/C. The PES status of this wetland remains unchanged. Impacts since the 2009 survey have not altered the function of the wetland to such a degree that it falls in a lower PES class.

9.7.4.2.2.4 Wetland D: Valley Bottom

Fieldwork conducted in 2014 supported the 2009 delineation. This wetland was characterised by surface water, sandy, though darker organic soil, and plant species typical of wetlands including *Haplocarpa scaposa*, *Helichrysum nudifolium*, *Nidorella anomala*, *Hypoxis rigidula* and *Burkeya radula*. highlights wetland characteristics recorded here.

Batchelor (2009) classified the Present Ecological Status of this wetland as class D/E. Although the integrity of this wetland has deteriorated since 2009, it has not deteriorated sufficiently to be classified as a lower category. Recent dumping is evident in the eastern section of the wetland. The other impacts, such as *Eucalyptus* trees planted along the southern section of the wetland, roads and pathways, have been present for some time.

9.7.4.2.2.5 Wetland E: Seepage

No wetland indicators could be found in this area during the 2014 survey. It appears as though erosion has led to the loss of topsoil exposing the hard plinthic layer. Plant species recorded in this area are not associated with soil moisture, but rather with disturbance. These species included *Seriphium plumosum* (Bankrupbush), *Bidens bipinnata*, *Bidens formosa*, *Senegaia mearnsii* (Black Wattle), *Datura stramonium*, *Gomphocarpus fruticosa*, *Tagetes minuta*, *Solanum incanum* and *Melia azedarach*.

Batchelor (2009) classified the Present Ecological Status of this wetland as class C/D. This wetland no longer exists.

Wetland conditions recorded in 2014 not reflected in the 2009 study

In the central portion of the site, a large area was found on which wetland indicators were recorded (Figure 8). This area is not reflected in Batchelor (2009). Areas of seepage indicated by rusty red

(oxidised Fe)/oily (soluble Mn) water characterised this area. Sedges (hydrophytic plants characteristic of wetlands) occurred in this area in some density. Distinct mottling in soil samples taken in this area provide further evidence of a fluctuating water table characteristic of wetlands.

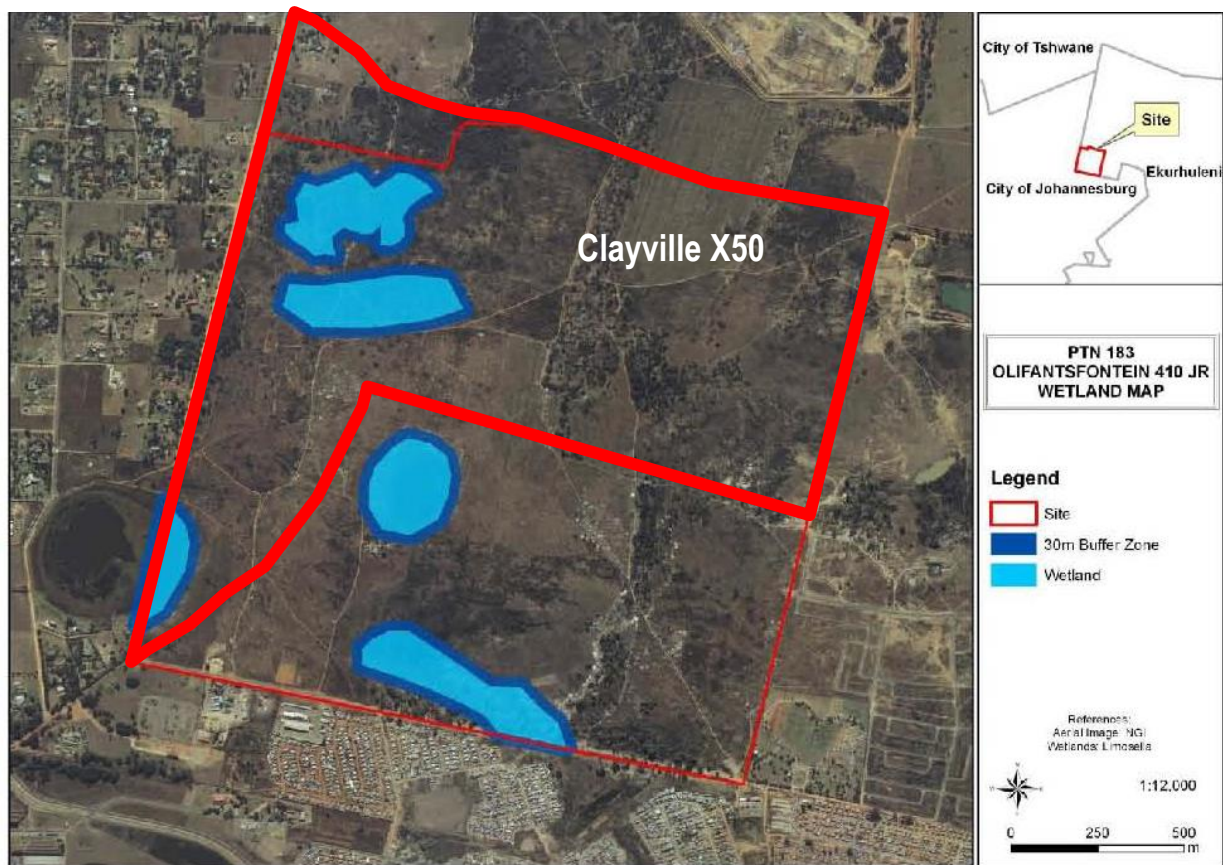


Figure 20: Wetlands recorded in the 2014 assessment with their associated buffer zones

9.7.4.3 Construction of community facility including a school on the area designated as a valley bottom wetland situated on Clayville X79

It is proposed that a Community Facility including a school be constructed on the area designated as a Valley Bottom Wetland on situated on Clayville X79. Refer to **Figure 27** below.

The valley bottom wetland has been described as falling within **class D/E**. The integrity of this wetland has deteriorated since 2009 .Recent dumping is evident in the eastern section of the wetland. The other impacts, such as *Eucalyptus* trees planted along the southern section of the wetland, roads and pathways, have been present for some time.

Furthermore as per GDARD's policies and Ekurhuleni Metropolitan Municipality's wetlands there are no wetlands situated in this area. Refer to **Figure 28** for Ekurhuleni's wetlands policies below.

It is proposed that a biodiversity offset plan including a rehabilitation plan must be compiled in conjunction with GDARD prior to commencement of construction to offset the loss of the degraded valley bottom wetland and rehabilitated and improve the current state of the open space system to be provided

as part of the Clayville/Tembisa Mega City project and to improve connectivity of ecologically sensitive areas in the Clayville area.

By rehabilitating and improving the allocated ecologically important open space relating to the Clayville/Tembisa Mega City project the quality of the ecologically sensitive areas, which are mostly very degraded as discussed above will be greatly improved.

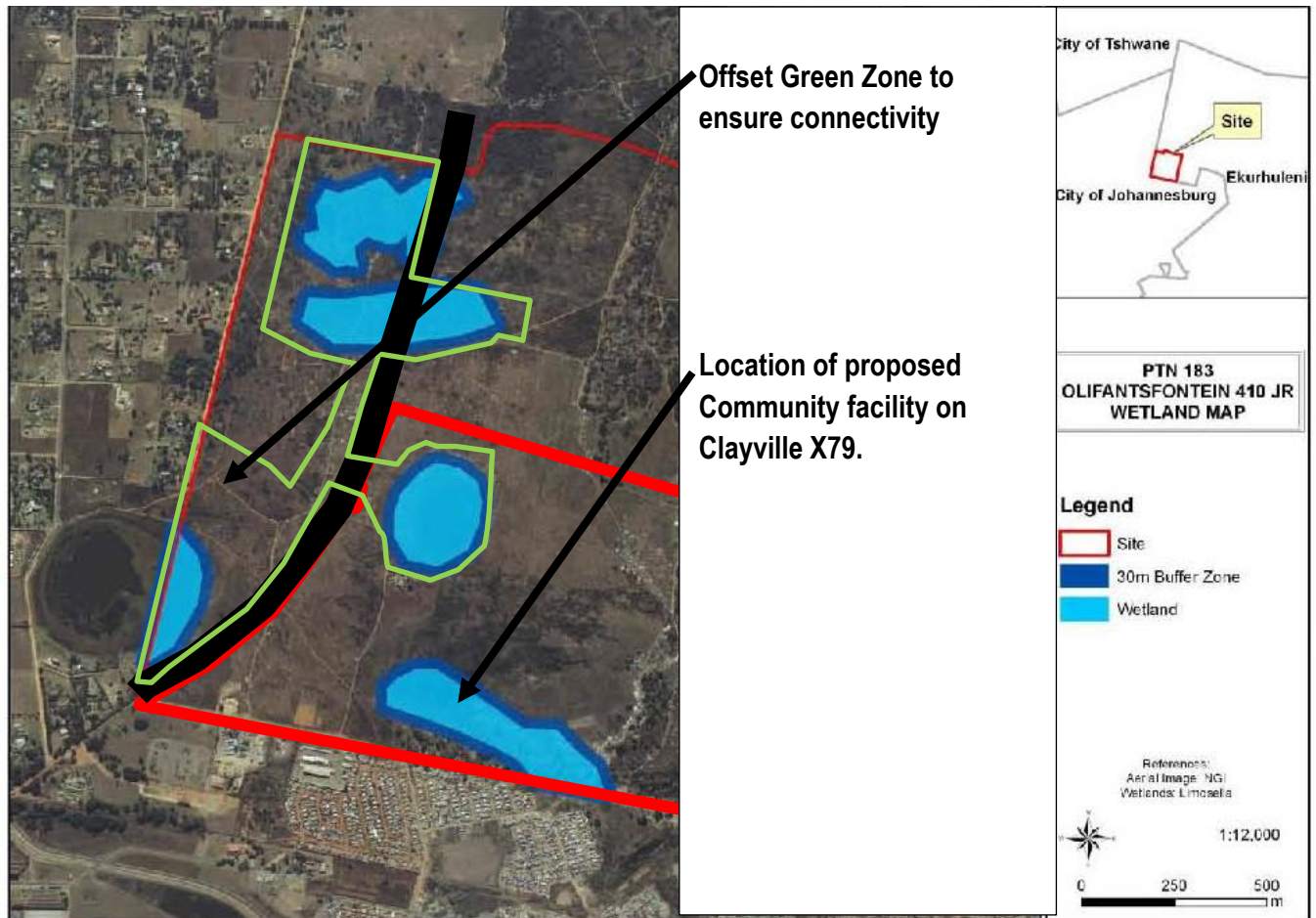


Figure 21: Proposed location of biodiversity offset plan

The proposed Community facility on Clayville X79 will be located on approximately 12 ha but will be will be mitigated with more than 36 ha (3x 12 ha) green connectivity areas outside the wetlands. It is thus proposed that a biodiversity offset plan be compiled in conjunction with GDARD to offset the loss of the degraded valley bottom wetland and rehabilitated and improve the current state of the open space system to be provided as part of the Clayville/Tembisa Mega City project and to improve connectivity

A wetland and open space rehabilitation and management plan has been completed and is attached hereto under **Annexure Q** and will be updated as required by the Record of Decision

10.0 DESCRIPTION OF SOCIO-ECONOMIC ENVIRONMENT

10.1 CULTURAL HERITAGE ASSESSMENT

For further information, please refer to **Annexure H1** for the **Cultural Heritage Resources Impact Assessment** as completed by *African Heritage Consultants* as well as the approval letter from the Provincial Heritage Resources Authority.

Scope of the Study

An independent heritage consultant was appointed to conduct a survey to locate, identify, evaluate and document sites, objects and structures of cultural importance found within the boundaries of the proposed development site. The following are the most important sites and objects protected by the National Heritage Act:

- Structures or parts of structures older than 60 years
- Archaeological sites and objects
- Palaeontological sites
- Meteorites
- Ship wrecks
- Burial grounds
- Graves of victims of conflict
- Public monuments and memorials
- Structures, places and objects protected through the publication of notices in the Gazette and Provincial Gazette
- Any other places or object which are considered to be of interest or of historical or cultural significance
- Geological sites of scientific or cultural importance
- Sites of significance relating to the history of slavery in South Africa
- Objects to which oral traditions are attached
- Sites of cultural significance or other value to a community or pattern of South African history

10.1.1 Methodology

All relevant maps and documents on the site were studied. The site was visited and evaluated.

10.1.2 Findings

The site lies near Sebokeng Township and illegal dumping takes place all along the rim of the site. The major portion of the site is highveld grassland with patches of exotic trees.

Near the centre of the site is a natural pan with water and on the south eastern and south western side are two farm workers settlements each with a number of buildings.

At S25° 58' 34.1" & E28° 10' 21.3" is the Mahlangu settlement consisting of a number of flat roofed and pitched roof houses. According to the inhabitants the Mahlangu family lives here since the late 1940's. The houses are typical of the period when grass (thatch) was replaced by corrugated iron as a roof covering. According to Mrs. Mahlangu there are no graves on the farm as the deceased were buried in the cemetery just north of the development area.

The second farm workers settlement is at S25° 58' 28.4 & E28° 10' 19.4". This settlement belongs to the Kutumelo family who live here since 1949. The houses are typical Ndebele flat roofed houses, but with no decorations – see photographs.

Except for the ruins of an old farm house of which little has survived, no other important structures or graves were found on the area. There is also no Stone Age material on the surface at the eroded areas and no graves.

The two Ndebele farm workers settlements will most probably be demolished during development. The two Ndebele farm settlements are typical of farm workers settlements and are older than sixty years. The two sites are given a rating of General Protection B (Field rating IV B and shall be recorded before destruction (Medium). Very few sites of this period and of farm workers settlements have been recorded in the past and are important in demonstrating the principal characteristics of a particular class of South African cultural history.

A Phase II heritage study is currently being undertaken by Leonie Marais-Botes.

Implications

From a heritage point of view the proposed development can continue.

Except for the two Ndebele farm workers settlements no other important cultural heritage resources or graves have been found on the proposed development site. The two farm workers settlements are important and should be fully recorded in a Phase II cultural heritage resources impact assessment (currently being undertaken by Leonie Marais-Botes) before an application can be made for demolishing permit.

If during construction any cultural heritage resources or graves are unearthed all work has to be stopped until the site has been inspected and mitigated by a cultural heritage practitioner.

10.2 PALEONTOLOGICAL ASSESSMENT

For further information, please refer to **Annexure H2** for the **Paleontological Impact Assessment** as completed by *African Heritage Consultants* as well as the approval letter from the Provincial Heritage Resources Authority.

The impact of the development on fossil heritage is INSIGNIFICANT or ZERO and therefore mitigation or conservation measures are not necessary for this development. A Phase 1 Palaeontological Assessment will not be recommended. The rocky outcrops, overburden and inter-burden need not be

surveyed for fossiliferous outcrops. Special care must be taken during the excavation of foundations, footings and channels, only if the presence of the Transvaal Supergroup is suspected.

10.3 VISUAL INTEGRITY OF THE AREA

Due to the topography and location of the study area, the proposed development will have some visual impact. However, it could have a positive impact if the development is planned well and integrated into the surroundings.

The following visual criteria were used to determine what possible visual impact the proposed development could have on the surrounding environment:

Table 7: Visual Impact Analysis

PREDICTED IMPACT			
Visual criteria	Low	Medium	High
Quality of the area	The site or surrounding environment has little or no natural quality	The site or surrounding environment has some natural quality	The site or surrounding environment has a definite natural quality
Compatibility with surrounding environment	The development will blend in / compliment the surrounding environment completely	The surrounding environment will be able to accommodate the development without looking out of context	The surrounding environment will not be able to accommodate the development. Development will look abnormal in setting
Viewing distance	Continuous viewing distance to site is less than 500m	Continuous viewing distance to site is between 500 m and 1 km	Continuous viewing distance to site is more than 1 km
Visual acceptance capability	The environment can visually accept the type of development, due to its location adjacent to the existing CBD	The environment can moderately accept the type of development, due to its varied vegetation and land-uses	The environment cannot visually accept the type of development, due to its unvarying vegetation and land-uses

The visual assessment shows that the visual quality of the development can fit into the surrounding residential areas due to the similar scale and texture of the proposed residential units (for example the existing Clayville development to the east of the site)

However, the views from the residential areas towards the site will be different than currently experienced. Although large areas of the natural lands will be retained, the residents will not be able to see it directly from their houses as it is currently perceived.



Figure 22: Views from the surrounding areas will be impacted with the proposed development Implications

It can be deduced that the proposed development will be able to blend in with the surrounding environment and will not look out of place due to its location within the developing realm. However, the views from the surrounding areas will largely be changed to be a developed areas rather than natural areas.

The architectural and landscape architectural guidelines for the proposed development will be developed to allow for a positive aesthetic influence on the surrounding environment. The guidelines will include placing of buildings, aspects of finishes, lights pollution, colours to blend into the surrounding colours, heights of buildings, and roof finishes. Aesthetics and contextual appropriateness is to be a major aspect of these guidelines.

11.0 ENVIRONMENTAL COMPOSITE MAP

An Environmental Composite Map was configured to clearly understand the various environmental characteristics and areas of significance that could be taken into consideration. This map indicates the following in relation to the proposed development site:

- Geotechnical Zones
- 1:100 year floodline delineation
- Contours
- High, medium and low ecological sensitivity
- Red data species with buffer areas.
- Riparian areas with buffers



Figure 23a: Environmental Composite



Figure 23b: Environmental Composite with layout

12.0 INFRASTRUCTURE AND SERVICES

12.1 TRAFFIC AND ACCESS ROUTES

Please refer to **Annexure G – Transportation Assessment** as completed by **WSP | Parsons Brinckerhoff**

Study methodology

During February 2015 a site visit was undertaken for the Traffic Impact Study and the following was confirmed:

- Layouts of intersections considered in the study
- Appropriateness of recommended site access
- Intersection control for relevant intersections
- Presence of existing public transport and no-motorised transport facilities

Traffic counts were used to estimate the traffic demand and traffic volumes for the proposed development. A traffic count was commissioned by WSP on Thursday 5th February 2015 at the following intersections:

- Olifantsfontein Road (R562)/Olifantsfontein Road
- Olifantsfontein Road (R562)/Main Road (Future K111)
- Main Road (Future K111)/Thabana Ntlenyana Drive
- Main Road (Future K111)/Riverside Street
- Main Road (Future K111)/Karee Street
- Dale Road/Archerfish Drive
- Dale Road/Modderfontein Road
- Dale Road/Old Pretoria Road

12.1.1 Surrounding Road Network

12.1.1.1 Provincial and National Planning

- Planned K111: Provincial dual carriageway road, K111 is planned on the existing Main Road alignment. The existing Main Road is currently operating at capacity. Therefore the planned K111 road will mitigate capacity constraints in the future.
- Planned K109: Provincial dual carriageway road, K109 is planned adjacent to the proposed development. The planned K109 will run in a north south direction and will connect Olifantsfontein Road (R562) to Dale Road/Archerfish Road. Two access points will be provided off the K109 to the proposed development.
- Planned PWV5: Provincial Class 1 freeway which is planned to run in the east west direction passing the north of the proposed Clayville Extension 50 township.

12.1.1.2 Surrounding road network

The following roads in the vicinity of the proposed development are regarded as relevant to this study and are discussed in detail below:

- Olifantsfontein Road (R562): This is a Class 2 dual carriageway road located to the north of the site which provides a link between the R101 and the R21 national freeway.
- Olifantsfontein Road: This is a Class 2 single carriageway road located to the north of the site which provides a link between the R101 and the R562.
- Main Road (Future K111): This is a Class 3 single carriageway road which runs in a north - south direction pass the east boundary of the site.
- Dale Road: This is a Class 3 road located to the west of the site; this road follows a north - south west alignment.
- Allan Road/Modderfontein Road: This is a Class 3 road located to the west of the site; this road follows a north - south east alignment.

12.1.2 Access to the proposed development

It is proposed that the development be served by two primary accesses off the planned future K109 route. The secondary access to the proposed development is off Main Road (planned future K111 route) and Thabana Ntlenyana Drive. Furthermore a future access is planned 500m north from the K111/Thabana Ntlenyana Drive intersection.

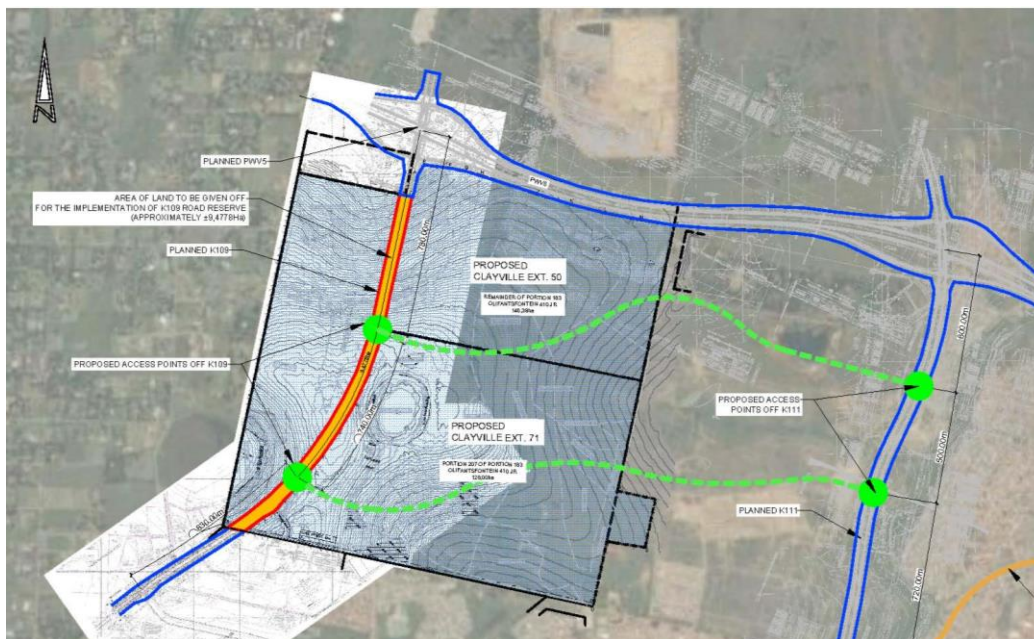


Figure 24:
Planned
routes and
proposed
accesses

12.1.3 Trip Generation

The proposed development is expected to generate approximately 5061 trips and 5870 trips (in and outbound) during the Weekday AM and PM peak hours respectively on the external road network.

12.1.4 Road and/or intersection upgrades required

The following existing intersections will require improvements:

- Olifantsfontein Road (R562)/Olifantsfontein Road
- Olifantsfontein Road (R562)/Main Road (Future K111)
- Main Road (Future K111)/Thabana Ntlenyana Drive

- Main Road (Future K111)/Riverside Street
- Main Road (Future K111)/Karee Street
- Dale Road/Archerfish Drive
- Dale Road/Modderfontein Road
- The following new intersections external to the development are required:
- Olifantsfontein Road (R562)/K109
- Access Road (R562)/K109
- Access Road (R562)/K109

12.1.5 Non-Motorised & Public Transport

- It is recommended that K109 be provided with a pair of public transport lay-bys in the form of bus and taxi stops at each access point where access to the township is gained. It is further recommended that the proposed lay-bys be constructed to the appropriate design standards of the relevant roads authority.
- In order to ease and formalise the movement of pedestrians between site accesses and the recommended lay-bys, it is proposed to construct at least 1.5m wide paved (or dust free) sidewalk along at least one side of all roads within the development.

Implications

From a traffic engineering perspective, the proposed development is regarded as feasible and sustainable and is therefore supported

12.2 CIVIL SERVICES

Please refer to **Annexure J – Civil Engineering Services Outline Scheme Report** as completed by *Bigen Africa*

12.2.1 Water

12.2.1.1 Authority and Service provider

The Ekurhuleni Metropolitan Municipality is the Water Service Authority for the Clayville development in terms of the Water Services Act (Act No. 108 of 1997).

12.2.1.2 Regional Supply

The project area is sited within the Ekurhuleni Metropolitan Municipality jurisdiction area. However, the existing bulk water infrastructure close to the development is located within the Johannesburg Metropolitan Municipality. Johannesburg's water entity, Johannesburg Water (Pty) Ltd, implements the stipulations of the Water Master plan for the Midrand MLC as compiled in 2000. This plan reflects the division of the Midrand supply area into 18 distribution zones, each served by either ground reservoirs or water towers. The project area falls within the PPT (President Park Tower) supply zone.

In addition to the above existing Johannesburg Water infrastructure, a 915mm diameter Rand Water Bulk RW3508 supply line is located within Allan Road to the west of the development. A 600ND connection from this Rand Water line exists to Clayville Extensions 71 and 50 and runs along the southern boundary of Clayville Extension 71. This bulk connection is to also supply water to Clayville

Extensions 71 and 50 via two zones within Extensions 71 and 50; a direct feed zone and a reservoir and tower zone.

12.2.1.3 *Water Demands*

The design of the bulk, link and internal reticulation required for the development will accommodate the ultimate demands anticipated. The proposed demands followed the identical approval process as that of the norms and standards. The total average annual daily demand (AADD) of the Clayville Ext 50 development project amounts to 4.3 Mℓ/day. The peak hour demand totals 203 ℓ/s.

12.2.1.4 *Design Norms and Standards*

The design criteria for the development of the site are based on the standards of Ekurhuleni Metropolitan Municipality: “Developer’s Guidelines to Installing Water and Sewer Services” which adopted the standards of the Guidelines for the Provision of Engineering Services and Amenities in Residential Township Development.

12.2.1.5 *Required upgrade*

As indicated above, Johannesburg Water and Rand Water bulk water infrastructure exist in close proximity to the development. The utilization of both entities’ infrastructure was considered for the provision of water, but the only viable option is the supply from the Rand Water infrastructure.

12.2.1.6 *Rand Water Infrastructure*

A 915mm diameter Klipfontein – Pretoria Rand Water Line RW3508 is situated within the road reserve of Allan Road to the West of the development. Supply to on-site infrastructure was considered by connecting to the abovementioned Rand Water pipeline. Rand Water requires that on-site storage facilities be provided if the peak flow rate exceeds 30% of the average annual daily demand flow rate.

As a result a 20Ml ground reservoir, a 2Ml Water tower and pump station which will supply the high and low pressure zone areas need to be constructed. A 700mm diameter supply line will be required between the Rand Water line and the new ground reservoir on site, as well as a new 400mm diameter steel connection line to the township. Refer to **Figure 24** below.

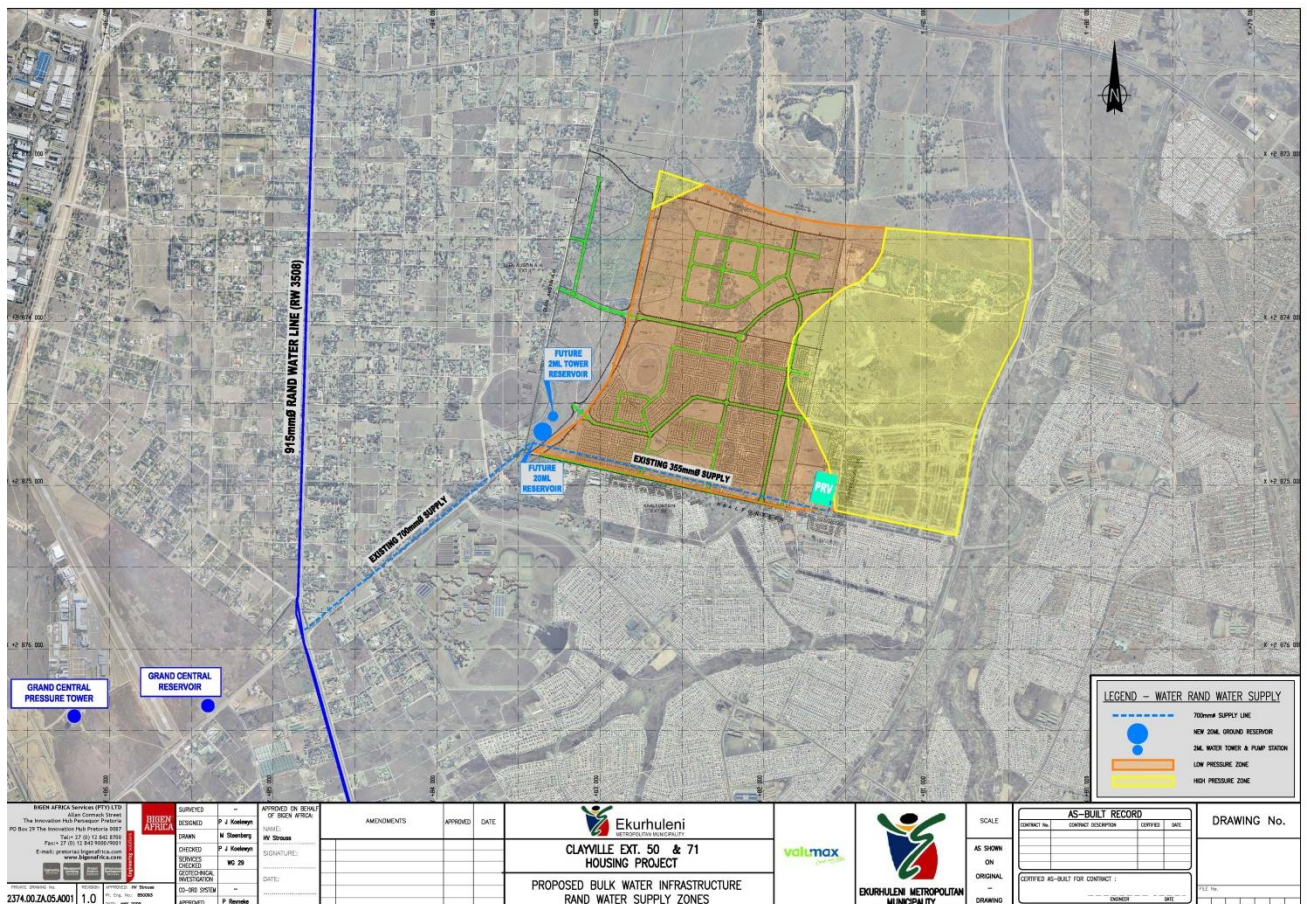


Figure 25: Proposed Bulk Water Infrastructure and Rand Water Supply Zones

Implications

Should the mitigation measures as provided in the Environmental Management Plan be implemented no added environmental impact is anticipated.

12.2.2 Proposed Sewer reticulation

12.2.2.1 Authority and Service Provider

The Ekurhuleni Metropolitan Municipality is the Water Service Authority for the Clayville Extension 50 development in terms of the Water Services Act (Act No. 108 of 1997).

12.2.2.2 Design Norms and Standards

The design criteria for the development of the site have been based on the standards of Ekurhuleni Metropolitan Municipality: "Developer's Guidelines to Installing Water and Sewer Services" which adopted the Guidelines for the provision of engineering services and amenities in residential township development.

Sewerage designs will be in line with the Sewer Master Plan of the area. The entire development will be in accordance with conventional level 3 – a metered pressure water connection with water-borne sanitation for each property.

12.2.2.3 Connection to existing Bulk Services

The Kempton Park Water Master Plan categorizes the project area within the “Eastern Area” served by the 750mm diameter ERWAT Regional Outfall Sewer, draining the entire area and connecting to the Olifantsfontein Waste Water Treatment Works (WWTW) located to the North West of Clayville.

12.2.2.4 Required upgrade

The natural topography of the site divides it into three drainage areas

Drainage Area One

Drainage area one (± 52.5 ha) drains to the south where it will connect into a bulk sewer located in the vicinity of the Kaalspruit floodline in Kaalfontein. A 160mm diameter link sewer of 1 100 m in length needs to be constructed and 475m of 250mm diameter need to be upgraded to a 315mm diameter pipeline. The sewer drains into the ERWAT Regional Outfall Sewer which drains into the Olifantsfontein WWTW.

Drainage Area Two and Three

Drainage area two (± 300 ha) slopes towards the east where a 450mm diameter communal link sewer) needs to be constructed which will drain both the Clayville Development and a future Ekurhuleni Housing Development ($\pm 4\,000$ stands) located to the east. This pipe follows the Kaalspruit flood line at a minimum slope.

Drainage area three drains Extension 50 and (± 50 ha) drains toward the north where a new 250mm diameter link needs to connect area three with the link of area two. A small pump station may be required to transfer the run-off from this area over the watershed into Drainage Area 2.

Pipe 2 and Pipe 3 will connect into the proposed 500mm outfall sewer and a 500mm sewer bridge crossing need to be constructed upstream of the connection into the ERWAT sewer east of the Kaalspruit. The total length of the outfall sewer is approximately 1.5km and the sewer bridge crossing is approximately 80 m in length.

The sewerage will be treated at the Olifantsfontein WWTW which has a total capacity of 105 Mℓ/day. Previously Ekurhuleni Metro Municipality indicated that the treatment works are currently operating at 65 Mℓ/day. ERWAT still needs to confirm that the works has sufficient capacity to accommodate sewer flows generated by the proposed development of 9.2 Mℓ/day.

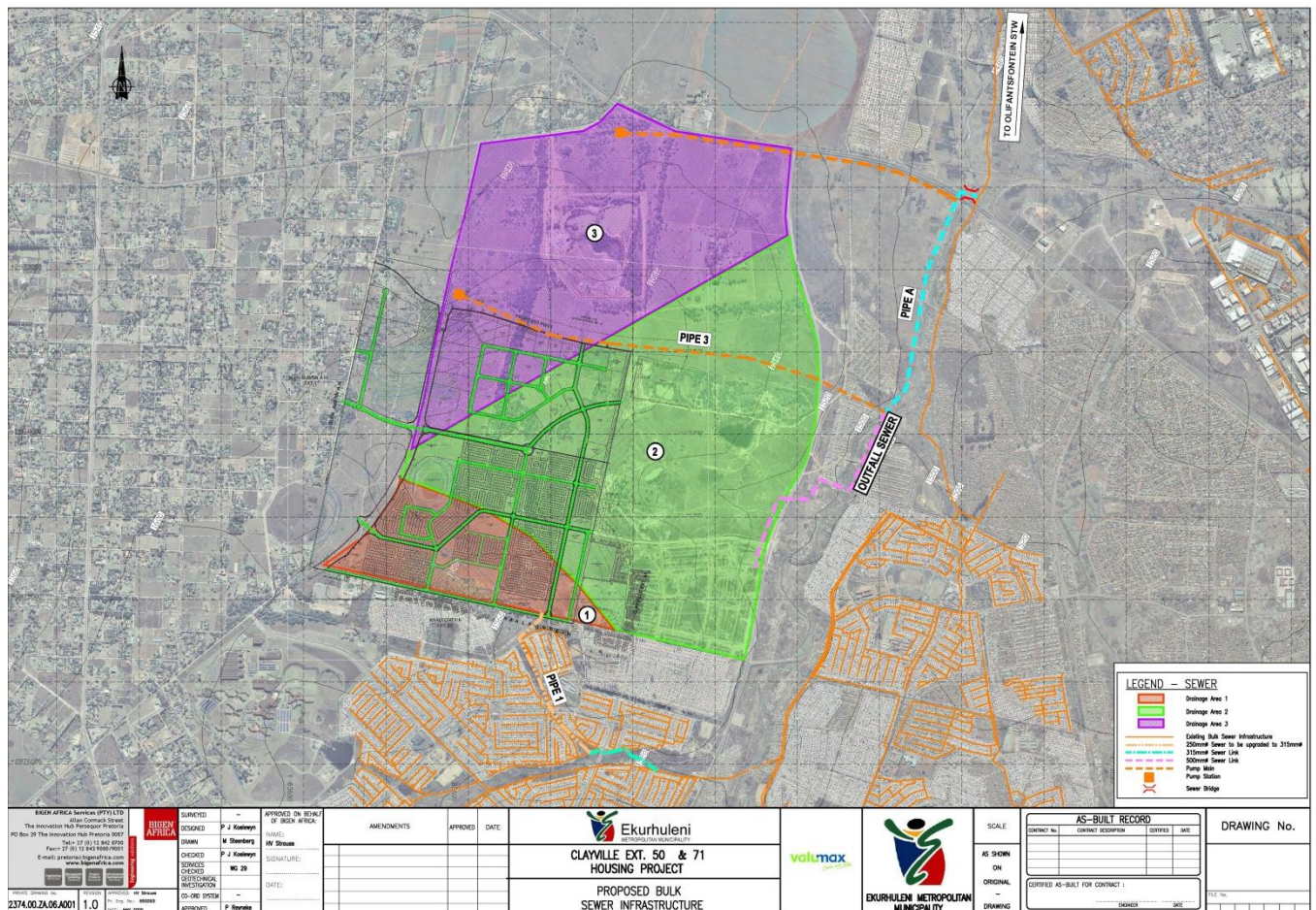


Figure 26: Proposed Bulk Sewer Infrastructure

12.2.3 Roads

The design guidelines of Ekurhuleni Metropolitan Municipality, supplemented by the Guidelines for Human Settlement Planning and Design (Red Book) were used to establish the criteria various road classes on relevant road reserve widths. This design will be finalized after the township is approved, inputs from a Traffic Engineer in the form of a Traffic Impact Assessment are provided, and before construction drawings are submitted for approval.

A structural design period of 20 years will be adopted.

Implications:

Bigen has proposed a road design for access to the proposed development based on existing infrastructure and information received. The final conditions and requirements from the Ekurhuleni Metropolitan Municipality need to be confirmed and reviewed for the proposed development.

12.2.4 Storm water

Please refer to **Annexure K – Stormwater Management Report** as completed by *Bigen Africa*

The minor stormwater drainage system is an underground pipe system that will collect stormwater at low points on roads and where justified, before intersections of roads. All commercial, educational,

residential 2 & 3 stands will be provided with direct stormwater connections. The major stormwater floods are drained at the low points of the development by the pipe systems designed to accommodate the major flood.

All stormwater is to be collected in attenuation ponds at the low points of the catchments and discharged into the downstream stormwater systems to the south and east of the development.

The site slopes primarily to the south and east from the higher pan area in the western portion of the site with slopes varying around 4%. The highest point on the site is the western portion (about 1602m amsl.) sloping towards the south and eastern portions of the site with a lowest points of about 1563m and 1553m amsl respectively. The north-west corner of the site slopes towards the north.

Ground Water Drainage Recommendations:

Signs of potential seepage and perched water tables were noted in many of the opened trial holes and are probably associated with the impermeable nature of the underlying pedocrete soils and bedrock across this site.

These seepage zones require particular attention. The following comments and recommendations apply:

- The subsurface profile typically consists of a thin horizon of hillwash, overlying hardpan ferricrete grading into soft and hard rock granite.
- During the rainy season ground water accumulation and lateral seepage occurs within the soils horizons, on the soil-ferricrete/granite interface. This water gathers upslope of the seepage zone and migrates downslope until it is forced to "daylight" by the outcropping or dramatic shallowing of the granite or ferricrete.
- These these sub-areas can be developed from a geotechnical perspective provided certain precautionary measures are implemented, including:
 - Use of cutoff drains topographically immediately above the delineated area and also the side drains in appropriately designed roads networks.
 - Subsurface drains located strategically to capture the groundwater seepage e.g. below the sewer pipeline in sewer trenches. These drains could remove the water and discharge it downslope possibly into road side drains.
 - Using spoil (from sub-areas shown on Figure 3) to backfill the deeper pan areas - later to be planned as POS.
 - All structures and walls will need to have adequate freeboard and appropriate damp proofing, to preclude rising damp.

Design philosophy and principles

The Rational Method was used in calculating the peak run-off discharge for the various stormwater catchment areas. A recurrence interval of 1:5 years was adopted for the design of the minor flood system and a recurrence interval of 1:25 years for the design of the piped major flood system.

As commercial, educational, residential 2 & 3 stands are provided with a stormwater connection, most stormwater will be accommodated in the stormwater pipe system and attenuation pond. During minor floods all the stormwater will be accommodated in the stormwater pipe system. Two primary access

roads will be constructed into these extensions Clayville 45, 50, 71, 76, 77, 78, 79 and 80, and will only be allowed to be partly flooded during a major storm event.

The stormwater management and mitigation will be approached primarily from the intention of Sustainable Urban Drainage Systems that will enhance the existing natural waterways, minimise or remove impact on the downstream systems and allow easy and continued maintenance such that the systems can function properly indefinitely.

Subsoil drainage will be kept and incorporated into the proposed stormwater systems. Overland flow systems will prevent flooding and hazards and direct major floods to safe discharge points that are protected from erosion. Underground piped systems will meet Ekurhuleni engineering standards and also discharge at outlets that are protected from erosion.

Drainage Routes to Be Utilised:

Each commercial, educational, residential 2 & 3 stand will be provided with a stormwater connection. The site is essentially is three major catchment areas draining to the north, south and east each into their own attenuation pond to be constructed as part of the works.

All three ponds will be compensate for the smaller areas in the west and north that cannot drain into these three ponds.

The pond in the south will be constructed at the low point on the original extension 71. The pond in the east will be constructed inside the northern area of extension 45 within the natural low point just above the origin of the water course there, thus maintaining the flow route into the watercourse.

The stormwater pond in the north will be constructed in the south-east corner of the future K111-PWV5 interchange which is on the northern edge of the original extension 50.

Design details:

A mean annual rainfall precipitation of 750mm/year was used to calculate the precipitation intensity to be used in the run-off discharge calculations.

The minor stormwater drainage system is an underground pipe system that will collect stormwater at specific stands, low points on roads and interim locations where necessary.

Kerb and field inlet structures are selectively placed to collect the minor stormwater flood into the piped systems.

Stormwater collected at the commercial, educational, residential 2 & 3 stands and on the roads is discharged into an attenuation pond. The ponds will then discharge into the existing stormwater systems to the north, south and east. Piped systems passing between erven will be constructed in appropriately registered servitudes in favour of the local authority.

Attenuation

It is a requirement of the Ekurhuleni Metropolitan Municipality that provision is made for stormwater attenuation to reduce the increased stormwater run-off resulting from the development to pre-development flow rates through the incorporation of stormwater attenuation ponds in the stormwater system. As such and because the pre-development site is disturbed due to earthwork and dumping activities on it the C value has been calculated in accordance with the National Drainage Manual.

Attenuation is achieved with an attenuation pond in the public open space at the south of X71. The volume of the attenuation pond is 63,130m³ with outlets of; 1 x 1050mm dia, 1 x 750mm dia and an overflow broad crest weir of 1.8m width as a back-up safety overflow.

The attenuation is achieved with an attenuation pond in the public open space at the top of the water course in X45. The volume of the attenuation pond is 73,939m³ with outlets of; 2 x 750mm dia, 2 x 1050mm dia and an overflow broad crest weir of 1.0m width as a back-up safety overflow.

The attenuation is achieved with an attenuation pond in the public services erf in the north of X50. The volume of the attenuation pond is 23,979m³ with outlets of; 3 x 450mm dia and an overflow broad crest weir of 1.8m width as a back-up safety overflow.



Figure 27: Stormwater drainage for the proposed development

Implications

Storm water can be accommodated in storm water attenuation structures.

The stormwater management master plan proposed for Clayville Extensions 71, 50 and 45N will consist of the following elements:

- Minor and a major stormwater system to convey water to the existing stormwater systems without causing damage to property, and furthermore designed according to accepted principles and standards.
- Ground water will be diverted to the piped stormwater systems via sub-soil drains or cut off drains at applicable locations to protect services and life.
- The stormwater design includes stormwater attenuation systems will decrease the peak flow to pre-development conditions.
- All elements are constructed in a way to blend in with the environment and will be barely noticeable once fully established.
- Attenuation ponds will be located in areas that are public open space, zoned for public services or even better where they can enhance and maintain existing water courses and wetlands to facilitate mitigation as close to natural conditions as possible.

No added environmental impact is anticipated.

12.3 ELECTRICAL SUPPLY

Please refer to **Annexure L – Electrical Services Report** as completed by *Lebohang Consulting Engineers*

The Clayville/Tembisa Mega Project is situated within the Ekurhuleni Metro Municipality Boundary and on the border of the Ekurhuleni Metropolitan Municipality (EMM) and Eskom supply areas which makes the provision of supply more challenging than under normal circumstances.

After basic planning was completed to establish the extent of the development, negotiations were entered into with Ekurhuleni Metropolitan Municipality Electricity and Energy for the provision of bulk electrical services for the development.

The scope of the project will entail the bulk electricity supply via Eskom backbone overhead network by Ekurhuleni Metropolitan Municipality through the self-build/turn-key construction of a new Ekurhuleni Metropolitan Municipality substation, the bulk link from the newly constructed sub to the development distribution points and the internal electrical reticulation inclusive of service connections and the street lighting networks. The entirety of the electrical infrastructure will be taken over by the Ekurhuleni Metropolitan Municipality for maintenance and billing purposes upon completion.

12.3.1 Design Criteria

12.3.1.1 Bulk Supply

Temporary bulk supply

Currently a Budget Quote has been received from Eskom for a temporary 7MVA supply to service a portion of the first phase of Clayville Ext 45 from their College Substation. According to Eskom there is minimal additional 11kV capacity at the substation however the HV capacity is limited and as a result no

additional load can be added to the substation. There are currently no other feasible temporary alternatives.

This supply will expire after 5 years and as a result a permanent bulk supply solution must be found for the entire development.

Permanent Bulk supply

Bulk supply in the area is constrained, however after holding meetings with Eskom they have indicated that a solution could be available as early as the end of 2016 when they envisage their HV network to be repaired, however planning meetings are continually being postponed and as yet there are no set dates which are being worked towards. If their current network is repaired, an upgrade will be required to create sufficient additional capacity on the repaired network. A new substation is required in the area not only to supply the Clayville/Tembisa Mega Project but also the surrounding areas. The developer has received confirmation from the relevant supply authorities that they will be allowed to construct the substation and associated works as a “Self-Build” Project due to Eskom/ Ekurhuleni Metropolitan Municipality’s capital constraints. The envisaged end state of the new Ekurhuleni Metropolitan Municipality Clayville substation is 3x30MVA 88/11kV. An approximate total capacity of 55 MVA is required for the entire Clayville/Tembisa Mega Project. This includes approximately 3 MVA excess per extension in order to cater for the unknown number and scale of the urban amenities.

After holding discussions with Eskom there appears to be 2 possible options for bringing sufficient capacity into the area, with each posing a different set of challenges.

Option 1 – Linking into existing Claystep/Clayglass 88kV ring:

Option 2 – Upgrading and repair of existing Lulamisa/Crowthorne 88kV infrastructure.

The Lulamisa-Crowthorne line had to be dismantled (Legal matter) which is one of the ring’s ends, the other end being the Lepini-Ivory Park line. Lepini-Ivory Park was already running at 101% under normal conditions before winter.

The entire associated network is operating under an abnormal situation and operational contingency plans are being used to prevent blackouts.

As a result, no immediate work can be done on any part of that network and no additional load can be added. A larger servitude will likely, still be required.

In order for the construction of the substation to proceed, Eskom’s network strengthening needs to be completed. No timelines are currently available for either option.

12.3.1.2 Internal Infrastructure

The proposed infrastructure will follow Ekurhuleni’s underground specifications as they will ultimately take over the infrastructure. The Medium Voltage (MV) infrastructure is underground; Low Voltage (L.V) infrastructure is underground and the service connections underground. The technical specifications discussed in the electrical services report may change after final discussions with Ekurhuleni.

MV Infrastructure

The development will be subdivided into zones and miniature substations placed per zone, rendering 3kVA per subsidised household ADMD and 3.5kVA per FLISP household ADMD according to Ekurhuleni Metropolitan Municipality Electricity and Energy specification. Essentially 500 kVA mini-substations may be used.

Mini-substation Information:

- Type: Type 'B' Mini-sub with SF6 RMU,
- Colour: Beige,
- LV Spurs: MCCB (Fixed size, CBI or similar) Contractor to size accordingly (depending on feeder size) and install.
- Including: Streetlight Control Panel
- The mini-subs must be installed complete with concrete plinths.
- All mini-substations must be fitted with protective structures.

All MV Cables will be to Ekurhuleni Standard: 6.35/11kV, 300mm² Al x 3 core PILC, screened cable. All MV cables are to be buried at a depth of 0.9m (on a 0.1m bed) total trench depth 1m, trench width 0.45m.

The mini-substations will be connected on ring/ 3 leg-ring design networks directly from the substation or switching station.

LV Infrastructure

The low voltage network will be fed from appropriately rated feeder circuit breakers in the miniature-substations via underground cables to Metering Kiosks (equal or similar to 12, 16 or 20 way Power Process Systems 3CR12). Earth conductors (120mm², 70mm² and 35mm²) must be run in parallel with the LV supply cables.

All meter kiosks must be protective structures able to house standard British footprint meters. LV cables will be 95mm² Cu PVC/PVC/SWA/PVC 600/1000V. All LV cables are to be buried at a depth of 0.5m (on a 0.1m bed) total trench depth 0.6m, trench width 0.3m.

Service Connections

Parameters:

- ADMD (Subsidised Unit): 3kVA/erf
- ADMD (FLISP Unit): 3.5kVA/erf
- Supply voltage: 420/242 Volt
- Regulation: +- 8%
- Service connection (max.): 40 Amp, Curve 1, 10kA (In Kiosk)

All service connections will be done with 16mm² 2-core Cu PVC/SWA cable and shall be installed from the Kiosk to the DB in the residential unit to avoid joining of cables. The service connection must be

able to interface with an Ekurhuleni specified pre-payment meter. Currently the preferred meter will be a standard footprint PLC meter.

Metering and Vending

The house owner is responsible for applying for a pre-paid meter directly at Ekurhuleni Metro Municipality. The contractor will terminate and install a CB in the Meter Kiosk and must clearly mark the Unit/House numbers in the Kiosk

Sleeves

Cable sleeves shall be installed for road crossings and any other required position where the sleeves would be considered appropriate. 160mm inside diameter PVC or NEX tube sleeves shall be used, buried at a depth of 1.5m where roads are to be constructed at a later stage.

Earthing

Earthing requirements shall be carried out in accordance with Ekurhuleni Metropolitan Municipality specification and shall adhere to the latest revision of the SANS 10292 (SABS 0292) *Earthing of low-voltage (LV) distribution systems*. The TN-C-S earthing system shall be employed.

Multiple earthing at less than 5Ω shall apply to all mini-substations.

Street Lighting

The public lighting shall be in accordance with Ekurhuleni Metropolitan Municipality specification and SANS 10098-1:2007, Table 2: *Recommended lighting values for group B and group C streets and footways*.

Streetlight Poles

New 8.7m galvanised steel poles shall be installed. The poles must be earthed using 6mm² BCEW

Streetlight Fittings

70W HPS Luminaire, side entry, no overhang with a boom angle of 15° must be installed. Luminaire mounting height: 7.5m. One fitting per pole.

12.3.2 Construction Stage

- Install components of the reticulation system as per Ekurhuleni Metropolitan Municipality specifications.
- Before installation all items must be inspected and approved to ensure that quality standards are maintained. Also obtain appropriate certificates and paperwork and forward to Ekurhuleni Metropolitan Municipality.
- After construction is complete the scheme shall be finally inspected.
- Inspection sheets shall be completed for record purposes.

12.3.3 Operation and Maintenance

The operation and maintenance of the electrical networks will be executed through the existing organisational structures of Ekurhuleni Metropolitan Municipality.

Implications

Electricity can be supplied to the facility by connecting into the existing facility and by providing the necessary upgrades as discussed above. Additional cables and lines will run along the existing roads and servitudes. No environmental impact is anticipated.

13.0 PUBLIC PARTICIPATION

Please refer to **Annexure M for the Public Participation Report**.

The Public Participation Process is being conducted as an essential component of the Environmental Impact Assessment Process in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended, and the Environmental Impact Assessment Regulations, 2006 (Version 1).

13.1 NOTIFICATION OF INTERESTED AND AFFECTED PARTIES

Interested and Affected Parties were notified of the public participation process for the proposed development in the following ways:

- A newspaper advertisement was placed in the Die Beeld Newspaper on 31 July 2014.
- As requested by the Gauteng Department of Agriculture and Rural Development the proposed project will be advertised in the Citizen newspaper. This advertisement will inform I&AP's of the project and indicate that the Draft Environmental Impact Assessment report is available for review and comment.
- Detailed site notices were prepared in accordance with the requirements of the Regulations and were erected at the main entrance to the property, as well as other visible points, on the 23rd and 29th of July 2014
- A Background Information Document (BID) was posted, faxed, emailed or hand delivered to adjacent landowners. Written acknowledgement has been gathered from each of these landowners. The BID document provides information concerning the proposed development. Interested and affected parties were invited to submit written comments concerning the proposed development and become part of the environmental process
- The Ward Councillor for the area (Ekurhuleni, Ward 1) Henry Vusi Shabalala and Ward Councillor Leepile Motsumi (CoJ – Ward 92) was informed regarding the proposed development via e-mail notification
- Local authority officials were contacted by the relevant consultants

13.2 PUBLIC MEETING

- A Public Meeting will be arranged with I&AP's once the Draft Environmental Impact Assessment has been made available to Interested and Affected Parties, once they have had sufficient time available to review the documents

The presentation that was prepared for the meeting will included under the Public Participation Report of completed as part of the Final Environmental Impact Assessment.

13.3 ISSUES AND CONCERNS

Written correspondence received from I&APs by LEAP has been collected and a list of all issues and concerns compiled. These are referred to the appropriate specialists for addressing. A list of issues and concerns was drawn up from the following sources:

- Written correspondence received from I&APs
- Issues identified by specialist studies
- Comments from Ward Councillor
- Comments from municipal officers
- Field observations

The Environmental Impact Assessment aims to address these issues & concerns from the public, and those identified during all the other methods of impact identification. All issues and concerns received throughout the entire environmental assessment process will be addressed in the Final Environmental Impact Assessment. Issues and concerns are addressed in this report.

13.4 PUBLIC INSIGHT

The Draft Scoping Report was made available to I&AP's for review and comment from the 24th of March 2015 until the 24th of April 2015. Comments that were received was included and addressed in the Comments and response report

The Draft Environmental Impact Assessment Report was made available for public insight from of December 2015 until end January 2016 in electronic format. The expected impacts, as issued by the I&APs are included in the issues and response register as attached to this report, also **Table 9** below. Comments received on the Draft EIA is included within the Comments and Response Report (Appendix 6) of the Public Participation Report (**Annexure M**)

13.5 ISSUES AND RESPONSE REGISTER

Table 8: Comments and response register

	NAME	DATE RECEIVED	COMMENT	RESPONSE
1.	Chris van Zyl	29/07/2014	<p>I suggest that the following issues of concern be investigated: Increased traffic; lack of infrastructure (sewage) to cater for demand</p> <p>I suggest the following for the public participation process: Full engagement and disclosure with residents of the area.</p> <p>Any other comments: Other areas of concern: Increased traffic; infrastructure capacity; loss of property value; strain on public services (fire/police); safety.</p>	<p>The traffic will be studied by the traffic engineer.</p> <p>A public meeting will be scheduled after the Draft reports have been made available,</p> <p>Noted</p>
2.	Christine Robinson	29/07/2014	<p>I suggest that the following issues of concern be investigated: The 3 fountains that supply water to the Glen Austin bird Sanctuary wetlands.</p> <p>Any other comments: Roads are inadequate No Sewage connections</p>	<p>The Glen Austin Pan is recognised as a protected environment and will be included in a suitable protected area.</p>
3.	Charles Warren-Hansen	29/07/2014	<p>I suggest that the following issues of concern be investigated: Appropriate sewage infrastructure, traffic congestion; noise pollution</p> <p>I suggest the following of the public participation process: Full engagement and disclosure with residents of the area</p> <p>Any other comments: Other areas of concern: Lack of infrastructure; Environmental impact; pollution; impact on property values; safety; etc.</p>	<p>These aspects will be investigated</p> <p>Public participation will be completed according to the NEMA requirements that require disclosure of all information.</p> <p>Noted</p>
4.	Success Lengwati	01/08/2014	<p>I suggest that the following issues of concern be investigated: Type of township/development protection of endangered species in the lake.</p>	<p>The Glen Austin Pan is recognised as a protected environment and will be included in a suitable protected area.</p>

CLAYVILE X50 SITUATED ON THE REMAINDER OF PORTION 183, PORTION 30 AND PORTION 31 OF THE FARM OLIFANTSFONTEIN 410 J.R – DRAFT EIA

	NAME	DATE RECEIVED	COMMENT	RESPONSE
5.	Maria McGibbon	04/08/2014	<p>I suggest that the following issues of concern be investigated: Impact on Environment? Especially wetlands, springs and borehole water and preservation of the grass owls and birds. Preservation of the bull frog and infrastructure and Roads and electricity can't cope now. This may be the breaking point. Pollution.</p> <p>I suggest the following for the public participation process: Impact study and other specialist studies – “independent” party.</p>	<p>Impact on the environment will be mitigated as best as possible. There will however be impact that cannot be mitigated but will be minimised to the extent possible.</p> <p>Studies that have been completed will be verified by and f necessary given to independent specialists.</p>
6.	<ul style="list-style-type: none"> • Jeff Norton • Glen Austin Residents Association • Johan Dijkman • Edward Thackeray • Vicki Thackeray • Steven Johnstone • Pieter Hanekom • Elsabe Nigrini • Gunther Tiepelt • Brian Landman • Raymond Oertli • Mami van Rooyen • Luanne Krog • Reinhard Kramer • Henry Krog 	Several I&AP's provided the same comment during the public participation process	<p>No development should take place within 1 km radius of the Glen Austin Pan. Devaluation of properties on the East side of Glen Austin. The GA Pan could be destroyed with pollution from the development.</p> <ul style="list-style-type: none"> • Once it is gone, it is gone forever. • Once RDP houses are built, there is no control and shacks get attached to them for renting out. • Litter • Overpopulation will become a problem. • Noise will be a problem. • What roads will be built to cater for this huge development? • Where will the access points be? • Will power cables be overhead or underground. • Please provide detailed development plans. • More information required about the Developer. • Who is the backer - last time it was Nedbank. • Who now owns the land? • Impact of dust and noise during the development. • Lots of concrete and roads and where will all the water drain to. • Contamination of boreholes. • Roads planned for over the wetland and underground fountains will have to be on stilts. • Wetland delineation should be done and buffer zones should be established around the wetlands. • Groundwater impacts. • The impact of sewerage on water is of concern - residents in some instances have boreholes only. • Preservation of the Bull Frog. • Preservation of Grass Owls. • Flamingos and other birds visit the pan during the summer - a development will stop this. • Protection of indigenous flora and fauna. • Protection of snakes - a rare snake was released there recently. • Dolomite study should be done. • Traffic congestion will be increased for Midrand. • Crime during construction. • Power supply already under pressure, the impact on power provision should be considered • Where will the sewerage works be. 	<p>Existing houses are constructed within 1 km. The studies of the specialist will be used to determine the actual movement of the Bullfrogs and the areas to be included in the buffers.</p> <p>Suitable fences and mitigation measures will be proposed to protect the vulnerable environments.</p> <p>Infrastructure will be upgraded to provide for the increase in population and needed services. These studies will be contained in the civil and electrical services reports and in the traffic assessments.</p> <p>The Strydom family owns the land.</p> <p>Valumax is a reputable organisation that provided quality developments in collaboration with the provincial and metropolitan housing departments. More can be read about their track record on their website at www.valumax.co.za/</p> <p>The construction phase is managed according to the Environmental Management Plan. A Community Liaison Officer will be appointed to serve as a contact person between the developers, Contractor and the Community.</p> <p>Wetlands and all specialist studies will be made available to the registered I&APs</p> <p>The majority of the site drains towards the east and where the existing bulk sewer lines are located. Drainage toward the west where the bore holes are located is minimal.</p> <p>An avifaunal study will indicate the presence of any protected bird species.</p> <p>A full geotechnical investigation will be completed. Results will be made available to the I&APs.</p> <p>Sewer drains towards the existing Olifantsvlei sewer works which lies to the north east of the proposed development</p>

CLAYVILE X50 SITUATED ON THE REMAINDER OF PORTION 183, PORTION 30 AND PORTION 31 OF THE FARM OLIFANTSFONTEIN 410 J.R – DRAFT EIA

	NAME	DATE RECEIVED	COMMENT	RESPONSE
			<ul style="list-style-type: none"> The specialist studies should be done by an independent party. Broaden the public awareness process. The developer should be present at meetings. Consult with Caroline Yetman - Bullfrog specialist and Paul Farrell- wetland specialist. 	Noted
7.	Jan van Kroonenburg	04/08/2014	<p>I suggest that the following issues of concern be investigated: That the two water bodies (pans) not be disturbed.</p> <p>Any other comments:</p> <ol style="list-style-type: none"> The GASDD to be taken into account Take into account the input the Glen Austin Residents Association into the K109? (Dale Road Ext). Routing be taken into account Urban Agriculture between van Riebeeck and K109 	<p>Please provide the explanation of GASDD</p> <p>The K routes are planned by the provincial roads department GAUTRANS. It is not something that the developer can amend without the approval and investigation of the repercussions by GAUTRANS. If required by GAUTRANS realignment will be investigated.</p>
8.	Sally Lanham	04/08/2014	<p>I suggest that the following issues of concern be investigated: Those adequate sewerage facilities will be provided, possible pollution and destruction of nearby conservancy and underground water.</p> <p>Any other comments: Traffic flow on old Olifantsfontein Road already heavy and existing road will not be adequate.</p>	<p>Sewer drains towards the existing Olifantsvlei sewer works which lies to the north east of the proposed development . Bore holes lies to the west of the development in another drainage catchment area.</p> <p>The required upgrades will be implemented according to the traffic impact assessments.</p>
9.	Megan Hudson	07/08/2014	<p>I suggest that the following issues of concern be investigated: Pollution of environment and underground aquifers; insufficient infrastructure and increased congestion.</p> <p>Any other comments: Protection of flora, fauna and natural resources; over population and increase in crime.</p>	<p>Appropriate buffers will be included to protect the sensitive environments.</p> <p>Fences and buffers areas will be incorporated to prevent people moving to the agricultural holdings west of the side of the development.</p>
10.	Adrian Schofield	10/08/2014	<p>I suggest that the following issues of concern be investigated: The preservation of the unique habitat of the African Bullfrog and the associated wetland.</p> <p>I suggest the following for the public participation process: Circulate the full detail of the previous EIA</p> <p>Any other comments: Include the Endangered Wildlife Trust</p>	<p>Appropriate buffers will be included to protect the sensitive environments.</p> <p>To be transparent, the previous I&AP list was used to make the new process known to the stakeholders. This is a new process with new applicant. They have been made aware by the EAP and the GDARD of the issues previously encountered from the I&APs.</p>
11.	Robert Russel Knowles	12/08/2014	<p>I suggest that the following issues of concern be investigated: Destruction of wetland. Negative impact on our borehole and agricultural / rural environment</p> <p>I suggest the following for the public participation process: The developer needs to give exact intentions and plans.</p> <p>Any other comments: Ivory Park was originally started to be only for 100 families. What guarantees are there to prevent the same scale of overpopulation and negative effect on surrounding areas.</p>	<p>Appropriate buffers will be included to protect the sensitive environments.</p> <p>Fences and buffers areas will be incorporated to prevent people moving to the agricultural holdings west of the side of the development.</p> <p>Aspects of the post 1994 urban environments are difficult to mitigate and manage. It is proposed that a buffer area be included between the new and existing developments to the west of the property.</p> <p>Residents must also take responsibility and implement a local security initiative to curb influx</p>

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	NAME	DATE RECEIVED	COMMENT	RESPONSE
				of criminal elements.
12.	Edward & Vicky Thackeray	12/08/2014	<p>I suggest that the following issues of concern be investigated: Impact on borehole water, we only use this due to unreliable rand water supply</p> <p>I suggest the following for the public participation process: Notifications to public required, eco studies on area needed.</p> <p>Any other comments: Roads are already inadequate and untarred. Preservation of only nature we have in Midrand. Devaluation of our property.</p>	<p>Sewer drains towards the existing Olifantsvlei sewer works which lies to the north east of the proposed development . Bore holes lies to the west of the development in another drainage catchment area.</p> <p>The public participation process is run according to the NEMA requirements.</p> <p>Upgrades will be implemented according to the Engineering studies and its recommendations.</p>
13.	Gerhard Schutte	13/08/2014	<p>I suggest that the following issues of concern be investigated: Proposed road from Dale Road to Olifantsfontein Road.</p> <p>Any other comments: 200m Buffer of 1000m² stands on Van Riebeek Road.</p>	<p>Upgrades will be implemented according to the traffic study recommendations.</p> <p>Noted</p>
14.	Antonio Nasciminto	14/08/2014	<p>I suggest that the following issues of concern be investigated: Overpopulation, noise, dust and access Roads</p> <p>Water drainage and contamination of bore holes</p>	<p>Impacts are identified according to the specialist studies.</p> <p>The EMP will be used to manage construction impacts.</p>
15.	Gizelle Teixeira	14/08/2014	<p>I suggest that the following issues of concern be investigated: Glen Austin Pan Conservancy and devaluation of houses.</p> <p>Water drainage and reticulation.</p> <p>Ground water impact.</p>	<p>Noted.</p> <p>Services will be installed and upgraded according to the results of the engineers studies. No ground water extraction will be required. Also, sewer drains towards the existing Olifantsvlei sewer works which lies to the north east of the proposed development . Bore holes lies to the west of the development in another drainage catchment area</p>
16.	Danica Quintas	14/08/2014	<p>I suggest the following issues of concern be investigated: Wetland conservancy and underground water. Impact of electricity shortage and development plans. Crime During construction and road building.</p>	<p>Sewer drains towards the existing Olifantsvlei sewer works which lies to the north east of the proposed development . Bore holes lies to the west of the development in another drainage catchment area.</p> <p>The required upgrades will be implemented according to the electrical engineering studies.</p> <p>The EMP will be used to manage construction impacts.</p>
17.	Alexandre Teixeira	14/08/2014	<p>I suggest the following issues of concern be investigated: Ground water impact, impact of sewerage and power. Impact on wetland and developer must be present at road reticulation and impact on traffic and electricity</p>	<p>Sewer drains towards the existing Olifantsvlei sewer works which lies to the north east of the proposed development . Bore holes lies to the west of the development in another drainage catchment area.</p> <p>The required upgrades will be implemented according to the engineering studies.</p>

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	NAME	DATE RECEIVED	COMMENT	RESPONSE
18.	Chukwudi Emmanuel Onyeari	14/08/2014	I am interested to erect a building for church meetings on site.	Noted. Information will be provided to the developer.
19.	Walter & Cathie Webb	18/08/2014	I suggest that the following issues of concern be investigated: Impact on surrounding reserve, Road and sewage infrastructure.	The required upgrades will be implemented according to the engineering studies.
20.	Stefan Niemiec	19/08/2014	I suggest that the following issues of concern be investigated: Roads, Drainage, Water, Electricity Infrastructure inadequate, conservancy will be destroyed. I suggest the following for the public participation process: Take a vote requiring majority of residents to approve. Any other comments Review Municipal spatial plan for compliance	The required upgrades will be implemented according to the engineering studies. The planning for extension of townships are completed at a strategic planning level and the residents participation at that level is required to implement detail planning and designs. The 2006/7 Northern Spatial Development Framework or the Spatial Development Framework for the Northern Area. designates the area for residential development.
21.	Nicolette Niemiec	18/08/2014	I suggest that the following issues of concern be investigated: Impact on infrastructure. No development near conservancy. I suggest the following for the public participation process: Local vote requiring majority of residents to agree. Any other comments: Review Municipality Spatial Plan for compliance	Services will be installed and upgraded according to the results of the engineer's studies. The majority of residents is located in Tembisa and have no problem with the development located adjacent to them . The 2006/7 Northern Spatial Development Framework or the Spatial Development Framework for the Northern Area. designates the area for residential development.
22.	Garth Edwards	20/08/2014	I suggest that the following issues of concern be investigated: Increased traffic volumes, noise and water pollution, security. Devaluation of property and Environmental Impact.	The required upgrades will be implemented according to the engineering studies. Impacts are identified according to the specialist studies. The EMP will be used to manage construction impacts.
23.	Schalk & MP Engelbrecht	20/08/2014	I suggest that the following issues of concern be investigated: The destruction of the bird and bullfrog wildlife sanctuary I suggest the following of the public participation process: Discuss to find a different area for new houses. Any other comments: The surrounding properties value will be affected by the new proposal. Another area must be found for new houses. The surrounding properties will lose all value if proposal goes ahead.	Appropriate buffers will be included to protect the sensitive environments. The land that Mr Strijdom owns has been in the market for many years and anyone envisioning an different community character here, could have made an offer to purchase the land. The reality is that the current market for housing in South Africa is NOT for affluent South African, but for needy previously disadvantaged South African.

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24.	Carl Krog	22/08/2014	<ol style="list-style-type: none"> 1) Conservation issues - Frogs, Fauna & Flora etc. 2) Development of this nature even if management of surrounding ecological areas is put in place, they are never managed after the development is handed over. The people occupying this sort of development do not take into consideration any conservation boundaries etc. Rubbish dumped anywhere, shacks and informal housing rises up all over the place, informal business on the side of the streets and to the entrance of these developments. Increased traffic with taxis and motor vehicles parked all over the show at the entrances to these developments. Something that clearly will affect the ecological, tranquility and surrounding area of Glen Austin. 3) Over population - people move in over and above what the development caters for. 4) Water table that will be affected by pollution etc. Taking away of vegetation that assists our table. The residents use boreholes for irrigation and drinking water. 5) Power and its implementation. 6) Our lifestyle in the area will change completely. We live in Glen Austin for its tranquility, where we can enjoy our horses and animals etc. 7) Crime will definitely rise! 8) Value of our properties will decline to Zero, loss of investment and lifestyle. 9) Depreciation of surrounding properties. <p>I suggest the following clearly takes precedent in the EIA process:</p> <ol style="list-style-type: none"> 1) Proper investigation into market value of existing properties 2) The study of present developments of this nature which will clearly indicate that a development of this nature cannot be built in the designated area! 3) Alternative areas needed to be looked at! 4) The developers main concern be financial 5) Developer is to appoint the persons required for the necessary studies but chosen by an independent party. 6) I as a resident of Glen Austin am clearly against the development of the area due to the concerns of the total ruination of the designated ecological areas once development handed over. Other developments of this nature have shown this. 7) The environmental impact assessment done in 2009 is referred to. 	<p>Appropriate buffers will be included to protect the sensitive environments.</p> <p>Fences and buffers areas will be incorporated to prevent people moving to the agricultural holdings west of the side of the development. Residents must also take responsibility and implement a local security initiative to curb influx of criminal elements.</p> <p>Votes must mobilise the local municipality to manage their lands to comply with the National Environmental responsibilities. Sewer drains towards the existing Olifantsvlei sewer works which lies to the north east of the proposed development . Bore holes lies to the west of the development in another drainage catchment area.</p> <p>Noted. It will be appreciated if such previous studied could be made available. The land that Mr Strijdom owns has been in the market for many years and anyone envisioning a different community character here, could have made on offer to purchase the land for that purpose. .</p> <p>Independent ecological studies are completed and have been updated and verified. Noted.</p> <p>The applicant was made aware of the issues raised in the previous EIA.</p>
25.	Norman Long	24/08/2014	<p>I suggest that the following issues of concern be investigated: The health impact of the waste disposal facility adjacent to proposed development.</p> <p>I suggest the following for the public participation process: Discuss pollution, litter, shacks, noise, roads, power, waste, groundwater, sewerage</p>	<p>The waste disposal facility has its own EIA process that is being followed.</p> <p>Noted.</p>
26.	Christina Dohm	24/08/2014	<p>I suggest that the following issues of concern be investigated: Negative effect on GA Pan, noise; water drainage; wetland destruction, preservation of bullfrogs and grass owls and snakes, crime</p> <p>I suggest the following for the public participation process: Full environmental impact.</p>	<p>Appropriate buffers will be included to protect the sensitive environments. The required upgrades will be implemented according to the engineering studies and impact assessments An EIA is being conducted.</p>
27.	Sharon Tiepelt	25/08/2014	<p>I suggest that the following issues of concern be investigated: Impact on environment, pollution, traffic volumes</p> <p>I suggest the following for the public participation process:</p>	<p>Engineering studies are being conducted on the required infrastructure.</p>

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	NAME	DATE RECEIVED	COMMENT	RESPONSE
			An open public meeting with all the role players to answer questions.	A meeting will be scheduled once all the information has been gathered and can be presented.
28.	Albert van Oldenmark	25/08/2014	<p>I suggest that the following issues of concern be investigated: Sewerage, Road infrastructure, Ecology damage – wetland, springs, bull frogs, devaluation of properties.</p> <p>I suggest the following for the public participation process: Openness and transparency, Independent parties to perform specialist studies, consideration of development east of the quarry.</p>	Independent specialist studies have been conducted and verified.
29.	Brian Landman	25/08/2014	The total infrastructure of Midrand to be upgraded to cater for this development at developers cost.	The required upgrades will be implemented according to the Engineering studies and impact assessments
30.	Dale Holmes	25/08/2014	<ul style="list-style-type: none"> The Glen Austin Pan may be destroyed due to pollution from the proposed development. It may adversely affect the wildlife that inhabit the Pan. Already the bull frogs are an endangered species. Conservation should be of the utmost importance. The protection of the indigenous flora and fauna, protection of grass owls, bull frogs, birdlife, etc. should be carefully considered. The existing road infrastructure will not cope with increased traffic flow. What impact will be increased traffic of heavy vehicles during the development have on the existing roads? What additional roads will be built, and where will the access points be to this development? Midrand already has major traffic congestion. The impact of sewerage is of great concern. Many residents depend on boreholes for their water supply. Can assurance be given that there will be no contamination of boreholes? What will be the impact of an increase of rainwater runoff to surrounding properties? Will this cause water and flooding damage? Please provide detailed development plans. 	<p>The Glen Austin Pan is recognised as a protected environment and will be included in a suitable protected area</p> <p>Impact on the environment will be mitigated as best as possible. There will however be impact that cannot be mitigated but will be minimised to the extent possible.</p> <p>Infrastructure will be upgraded to provide for the increase in population and needed services. These studies will be contained in the civil and electrical services reports and in the traffic assessments.</p> <p>Sewer drains towards the existing Olifantsvlei sewer works which lies to the north east of the proposed development. Bore holes lies to the west of the development in another drainage catchment area.</p> <p>Development plans will be provided as part of the Draft EIA when all the specialist studies will also be available.</p>
31.	Dennis Greaves	26/08/2014	Impact on bullfrog reserves	The Glen Austin Pan is recognised as a protected environment and will be included in a suitable protected area.
32.	David & Christiene Morris	27/08/2014	<p>I suggest that the following issues of concern be investigated: Traffic studies / security to properties. EIA on adjoining wetland / Bird Sanctuary / Property Valuations</p> <p>I suggest the following of the public participation process: Involvement of all affected parties.</p>	<p>Infrastructure will be upgraded to provide for the increase in population and needed services. These studies will be contained in the civil and electrical services reports and in the traffic assessments.</p> <p>Public participation will be completed according to the NEMA requirements that require disclosure of all information</p>
33.	<ul style="list-style-type: none"> Marina Divo Karen Gerhardt Heleen Prinsloo Gideon Alderson Stuart Alderson Helen Divo Yvette Dunienville Simon Dunienville 	Several I&AP's provided the same comment during the public participation	<p>I suggest that the following issues of concern be investigated:</p> <ol style="list-style-type: none"> If this development goes ahead, it will spell disaster and the destruction of the Glen Austin Pan which is an extremely important bird sanctuary. It will create overpopulation of the area. There is already large low density housing areas in the vicinity. The roads in the area will not be able to cope with the extra traffic. Sewerage will be a problem. Most of Glen Austin relies on ground water which will become contaminated. 	<p>The Glen Austin Pan is recognised as a protected environment and will be included in a suitable protected area.</p> <p>Roads and Infrastructure will be upgraded to provide for the increase in population and needed services. These studies will be contained in the civil and electrical services reports and in the traffic assessments</p>

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	<ul style="list-style-type: none"> Eldred Bell Owen Bell Natasha Bell Tamara Bell Brigitte Bell Alex Divov 		<p>5. The wetlands and underground water fountains will become contaminated.</p> <p>6. The power supply in the area is already under pressure so will not be able to service this proposed new development.</p> <p>7. Crime in Glen Austin will increase.</p> <p>8. The property values in Glen Austin will dramatically decline so if the development is to go ahead, the developers must first arrange a reduction of municipal values for all the Glen Austin properties.</p> <p>I suggest the following for the public participation process: Advertising in local land national press: English & Afrikaans</p> <p>Any other comments: Environmental study must be done</p>	<p>Sewer drains towards the existing Olifantsvlei sewer works which lies to the north east of the proposed development</p> <p>Appropriate buffers will be included to protect the sensitive environments.</p> <p>Fences and buffers areas will be incorporated to prevent people moving to the agricultural holdings west of the side of the development.</p> <p>Aspects of the post 1994 urban environments are difficult to mitigate and manage. It is proposed that a buffer area be included between the new and existing developments to the west of the property.</p> <p>Residents must also take responsibility and implement a local security initiative to curb influx of criminal elements.</p>
34.	Helen Divov	28/08/2014	I sternly object to this development which will adversely affect my lifestyle and the value of my properties.	Noted.
35.	Owen Bell	28/08/2014	<p>I suggest that the following issues of concern be investigated: Security e.g. police station and fire stations</p> <p>Any other comments: There is a wetland that needs to be protected as it is a major filter for underground water and the home of a near extinct African bull frog, also bird wild life.</p>	<p>Appropriate buffers will be included to protect the sensitive environments.</p> <p>Fences and buffers areas will be incorporated to prevent people moving to the agricultural holdings west of the side of the development.</p> <p>Aspects of the post 1994 urban environments are difficult to mitigate and manage. It is proposed that a buffer area be included between the new and existing developments to the west of the property.</p> <p>Residents must also take responsibility and implement a local security initiative to curb influx of criminal elements</p>
36.	Natasha Bell	28/08/2014	Protection of wetland essential – It is resource of Glen Austin's water	Appropriate buffers will be included to protect the sensitive environments.
37.	Tamara Bell	28/08/2014	There is an existing wetland and conservancy in place that has to be protected	Appropriate buffers will be included to protect the sensitive environments.
38.	Patricia Kreeel	28/08/2014	<ul style="list-style-type: none"> No development should be allowed to take place within 1km radius of the Glen Austin Pan because the pan will become polluted and destroyed Contamination of boreholes through the pollution The habitats of the grass owls and other birds will be destroyed The bullfrogs and other frogs habitats will be destroyed The wetland and any flora and fauna will be destroyed The wetland and any flora and fauna will be destroyed Glen Austin has been registered as a conservancy therefore every effort should be made to preserve the pan and not put it at risk of being reduced into a dumping area and another place for pollution to take over ecology. 	<p>Existing houses are constructed within 1 km. The studies of the specialist will be used to determine the actual movement of the Bullfrogs and the areas to be included in the buffers. Suitable fences and mitigation measures will be proposed to protect the vulnerable environments.</p> <p>The construction phase is managed according to the Environmental Management Plan. A Community Liaison Officer will be appointed to serve as a contact person between the developers, Contractor and the Community.</p> <p>Wetlands and all specialist studies will be made available to the registered I&APs</p> <p>The site majority of the site drains towards the east and where the existing bulk sewer lines are located. Drainage toward the west where the bore holes are located is minimal.</p> <p>An avifaunal study will indicate the presence of any protected bird species.</p> <p>A full geotechnical investigation will be completed. Results will be made available to the I&APs.</p>

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				Sewer drains towards the existing Olifantsvlei sewer works which lies to the north east of the proposed development Noted
39.	Geoffrey Robinson	28/08/2014	1km zone between pan water's edge and buildings due to breeding zone of bullfrogs. More advertising in Midrand Reporter.	Existing houses are constructed within 1 km. The studies of the specialist will be used to determine the actual movement of the Bullfrogs and the areas to be included in the buffers. Suitable fences and mitigation measures will be proposed to protect the vulnerable environments. Noted.
40.	Elisabeth Hinke	02/09/2014	<ul style="list-style-type: none"> I have done all required paperwork to register the Conservancy 2009 – does still may have any impact? As we know a lot of deterioration took place but the buffer zone of 1-1.5km for the pan should still exist. Here some facts and questions for my registrations. On the border of Glen Austin to Ekurhuleni Municipality (mainly Strijdom Farm) lies the precious ancient Giant Bullfrog pan. This seasonal wetland site, which comes alive during the rainy season, <u>is home of a red data species, the Giant Bullfrog</u>, but also other frog species. The decline of these important fellows is more and more visible (the area is invested with termites and people use poison to eradicate them – more toxic waste for our ground water on the end....) The Bullfrog pan is also an important stop-over for migration birds (yellow billed stork, spoon billed stork, Cormorants, White-faced Ducks, Flamingos, Egrets and Egyptian Geese and many rare winged guests can be spotted during the summer season. The Strijdom Farm lays on the highest geological formation on the North-West border of Midrand and forms herewith an important water-shed. The <i>ephemeral</i> wetland side (more or less untouched until the 1970ties) functions on a high water table and has therefore formed rich water sources. Excessive borehole use has already caused the drop of the water table, however, the still clean ground water is an important water-source for many households here in the area. With the planned housing development a threat for the drinking water is given as the government will not provide enough educational programmes to bring in responsible home owners taking care of their environment (oil spills by not maintained cars, rubble, chemical waste and others will seep into the soil and spoil the water. Glen Austin, Randjesfontein including the big Strijdom farmland function still as a great 'green lung' in the air-polluted mega city. JHB-PTA. takes 7th place world-wide if it comes to air-pollution. Our municipalities should protect us and provide or safe green lungs! Infrastructure: At time we have already a peak situation during morning and evening rush hours on Olifantfontein-, Dale-, Alan-, Hampton-, Belvedere-, George-Road! Even a development of certain roads in this area will not bring the desired effect as the 'catch-up' roads like Old Pretoria Road, K101, R562 already burst with the given capacity of traffic load. Electricity: The Strijdom Farm and closer surroundings is a high target zone during summer thunderstorms for lightening (water table, high elevation in this area). What kind of security will be offered by the developers and who is paying for a – most probably constant – damage? The neighbours on Van Riebeeck Road and bordering George Road (where I live) normally have no electricity after a thunder storm and our 	<p>A copy of the plan or map of the registered Conservancy with the mandates from the owners will be appreciated. The Glen Austin Pan is recognised as a protected environment and will be included in a suitable protected area. Noted.</p> <p>Noted.</p> <p>Noted</p> <p>The majority of the site drains towards the east and where the existing bulk sewer lines are located. Drainage toward the west where the bore holes are located is minimal.</p> <p>Noted</p> <p>Infrastructure will be upgraded to provide for the increase in population and needed services. These studies will be contained in the civil and electrical services reports and in the traffic assessments.</p>

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			<p>electrical installations and appliances are often damaged!</p> <ul style="list-style-type: none"> • <u>The new development also needs to be supplied with electricity and we already in very short supply</u> – how will this issue be solved? • The North-West area of Midrand (Randjesfontein., Glen Austin) rely on septic tanks and French drains. What is the plan for waste-water, sewerage and water-provision in the new development (with a view on the sensitive ground-water again)? • On the northern border of Strijdom Farm (next to Old Olifantsfontein-Road) an old quarry was transformed into a rubble site. This has already a bad impact on the ground water on this side. The quarry functioned as a wildlife refuge for little duikers, owls and others and was destroyed. • However, far worse....the dump site has regular burnings of toxic waste (mostly at night) and releases toxic air for the neighbourhoods mainly at night! Pollution and development – how does this fit together? • Besides...some interesting facts to know: • Most areas of Gauteng were formerly viable grasslands (not savannah with trees!) with ephemeral wetland spots (like the pan), although they are often undervalued in terms of their contribution of ecosystem services to the broader landscape compared to other wetland systems. There is a lack of understanding of ephemeral systems function and their ecological resilience, also the ability of the system to adapt to significant (directional) change. Those system are highly dynamic, however, ecosystem degradation through the direct impacts of land use such as urbanisation, erosion, indirect interferences on flow rates (borehole use), has greatly simplified these systems and reduced their resilience and hence their ability to adapt to climate change (in long term). Decreased resilience in ephemeral wetlands coupled with inadequate knowledge of how these systems function, has serious implications for the future sustainability of existing landscapes, <u>clean water resources</u>, fauna and flora and for us. • Have a closer look on the on storm water we had last summer! Buffer zones to prevent more damage are urgently needed and the Glen Austin/Strijdom Farm still functions like a buffer zone! Send some pictures with next mail. • My personal solution for this part of our 'green lung' in this mega-city-development would be a small farmer's educational centre (includes sensitive environmental programme) but I guess that this is not in the interest of money-orientated owner and Municipality? 	<p>Water quality test results before and after the establishment of the land fill will be helpful in determining the alleged impact on the ground water.</p> <p>Results of air quality test results before and after the establishment of the land fill will be helpful in determining the alleged impact on the air quality.</p> <p>Noted.</p> <p>Noted.</p> <p>Noted . Urban agriculture is an option that can be investigated. However the bull frogs don't like to compete with spades and shovels.</p>
41.	Elisabeth Hinke	29/09/2014	<p>Further North on the Farm next to the "legal" dumpsite from Interwaste a huge area (right into the wetland) has been filled with building rubble – the area is surrounded by sticks with some wires quickly pulled around and declared as 'bought property' from Strijdom – buyer: SA Demolisher. We asked for re-zoning plans and EIR but they say, we bought it and according to them it is in process (never!) and they rent now from Strijdom.....but nobody gave them permission to dump on a wetland, or?</p> <p>Well, we guess it is a huge scam to get rid of the wetland – good reason for this thinking is</p> <ul style="list-style-type: none"> - they dump only <u>at night</u> and some vagrants are since then busy to burn the cables (toxic smell in the air at night) besides that the rain now comes and all the toxic like asbestos etc. are in the groundwater. - no SA demolisher is driving – these are so-called subcontractors from SA Demolisher and 	<p>Noted. The waste project is not related to the residential development proposed on portion 183 or 207.</p> <p>Please contact the land owner directly or the municipality for information regarding the waste activity.</p> <p>The wetlands are delineated by a qualified specialist and the condition is determined according to the minimum requirements of the national Department of Agriculture Forestry and Fisheries. (DWAF)</p>

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	NAME	DATE RECEIVED	COMMENT	RESPONSE
			<p>SA Demolisher said: We have nothing to do with it....</p> <p>Just interesting enough to show what happens a little bit further down where all the development should go on.and with a bit gut feeling one can point out the real culprits.</p> <p>On Friday Miyelani from GDARD was here for investigation and what he needs now is the address and contacts for the Strijdom Family Trust – can you provide me urgently with it?</p>	<p>Noted.</p> <p>Unfortunately, we don't have the contact details of the land owner – we are appointed by the applicant that has no responsibility other than the land under application. The application form only shows a ID number for Mr Strydom – not a contact number.</p>
42.	Michelle Botha	23/10/2014	<p>CV's and Qualifications of specialist:</p> <ul style="list-style-type: none"> Please ensure that the CV's and qualifications of all specialists used to conduct biodiversity assessments are provided. <p>Dust:</p> <ul style="list-style-type: none"> There will be dust created during the construction phase resulting in air pollution as well as a visual disturbance Please do dust monitoring now to determine the current dust levels and then calculate the expected dust levels to determine if the developers will exceed the standards when construction commences <p>Noise:</p> <ul style="list-style-type: none"> There will be noise during both the construction and occupational phases Please do a baseline noise assessment to determine the current noise levels and then calculate the expected noise levels to determine if the developers will exceed the acceptable levels <p>Birds:</p> <ul style="list-style-type: none"> Numerous Red Data birds exists in the area, there are also many water birds near the pans Please do an avifauna study to determine the impact of the development on the bird life due to loss of habitat In addition, the developers are constructing powerlines and therefore a study needs to be done focused on the possible infrastructure related bird collisions <p>Wetlands/pans:</p> <ul style="list-style-type: none"> There are 2 pans on the property and several other wetlands The pans are classified as NFEPA (National Freshwater Ecosystem Priority Area) Wetlands by SANBI The pans and wetlands are likely to be interlinked and their functioning should be assessed in relation to each other The pans attract many water birds and these birds should be included in the avifauna study <p>Sense of place / change of lifestyle:</p> <ul style="list-style-type: none"> The sense of place will change from a largely rural / small holding sense or place to an urbanised / industrial sense of place Sense of place is the character of a place This is one of the aspects that should be covered in a visual impact assessment 	<p>All specialists have CV's on file with GDARD.</p> <p>The dust is addressed under EMP for the construction and operations phases.</p> <p>The noise is addressed under EMP for the construction and operations phases.</p> <p>The bird life is addressed under the specialists reports.</p> <p>The wetlands are addressed under the specialist reports. .</p> <p>The sense of place is addressed under the specialist reports.</p>

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			<ul style="list-style-type: none"> You have advised that you will not be conducting a visual impact assessment as the development will not have a visual impact I disagree and would request that you do a visual impact assessment including a section on the sense of place / lifestyle changes <p>Glen Austin Bird Sanctuary:</p> <ul style="list-style-type: none"> According to the SANBI protected areas, this bird sanctuary actually overlaps the south-eastern corner of the property <p>Air quality/pollution:</p> <ul style="list-style-type: none"> This includes other pollutants that could be produced from factories in the industrial area Please do an air quality impact assessment including dispersion modelling if there will be any factories emitting pollutants into the air Please disclose what type of industry they are planning (there is very little detailed information with regards to the type of development) <p>Comments on the scoping report:</p> <p>Fauna:</p> <ul style="list-style-type: none"> It is confirmed that the study will focus on the Giant Bullfrogs but what about the other animals in the area (most likely small mammals) Please include a full fauna study <p>Threatened Ecosystems and Priority Area (SANBI 2011):</p> <ul style="list-style-type: none"> Vegetation from 2 threatened ecosystems occur on the property, namely, Egoli Granite Grassland which is endangered and Glen Austin Pan which is critical The property is within the Bushveld-Bankenveld priority area This is relevant to the biodiversity studies <p>Surface Water:</p> <ul style="list-style-type: none"> The property falls in a Phase 2 FEPA (Freshwater Ecosystem Priority Area) catchment Please ensure that the floodline determination you are doing is signed off by a registered engineer Please also look at the impact of the development on the surface water in the area <p>Visual:</p> <ul style="list-style-type: none"> In the scoping report it is claimed that the development will not have a significant visual impact and therefore you/they will not be conducting a visual impact assessment Please do a visual impact assessment with viewshed modelling including an evaluation of the changes to the sense of place of the area 	<p>Noted</p> <p>Air quality is addressed as part of the Ekurhuleni Air Quality base studies.</p> <p>The bullfrogs are addressed under the specialist reports.</p> <p>The vegetation is addressed under the specialist reports.</p> <p>The hydrology is addressed under the specialist reports and by the engineers</p> <p>The visual assessment is addressed under the specialist reports.</p>
43.	Christine Robinson – Glen Austin Residents Association	24/10/2014	<p>Same as Plot 207 we want to know the distance from the Bird Sanctuary to the building line.</p> <p>We want to know how many houses are envisaged and what type.</p>	The layout plans are being finalised and will be provided as part of the Draft EIA.

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44.	Jan van Kroonenburg	27/10/2014	<p>In connection with the above draft report I comment as follows:</p> <p>Although the properties are situated in Ekurhuleni the spatial development plans that apply in the area adjacent need to be taken into account. These plans are the Glen Austin Spatial Development Plan and the Johannesburg development plans that may apply. The GASDP represent the thinking of the residents of Glen Austin and must be taken into account.</p> <p>The thinking that was expressed at the time the R109 was routed was the route would not pass between the two main water bodies that make up the Glen Austin Pan complex. This meant that the route would be move eastward to incorporate the East pan and then be aligned parallel to van Riebeeck Road a distance that equalled the depth of the plots East of van Riebeeck and South of Olifantsfontein. The space thus defined namely van Riebeeck on the West and the 109 on the east could possibly become urban agriculture, or grazing. The area defined by the route of the R109 East of the East pan could become a conservation area of the two pans in a holistic and meaningful way. I may add that at the time that the GASDP was formulated with the Jo'burg Planning I was the chairman of the Glen Austin Residents Association (GARA).</p>	<p>Noted. the Townplanners will be informed to obtain such.</p> <p>A copy will be appreciated.</p> <p>Noted.</p>
45.	David & Christiene Morris	27/10/2014	<p>Location Should the development not be located closer to Tembisa/ Olifantsfontein where there is an established infrastructure and work opportunities? Kindly advise to which work opportunities the report is referring in para 5.1.</p> <p>Road access Key portions of the Old Pretoria road – k101, Allan Road, Dale Road, Olifantsfontein road, have remained unchanged for decades. Congestion / delays, relative to the traffic volume, are unacceptable, before even considering yet further increases in traffic. A key feeder – George road, remains partially untarred after many years and is a disturbing example of where First World and Third world meet. A development behind the Eskom training centre has several thousand dwellings all with attendant transport needs – and NO change has been made to relieve traffic for these residents. From a traffic flow viewpoint, Johannesburg municipality really do believe that you can “fit a quart into a pint pot”.</p> <p>Environmental concerns Extinction is forever – a statement of the obvious. The pan is a pristine wetland- one of the few remaining bullfrog breeding points on the Highveld. Any assurances, in this regard, should be seen in the light of the Fourways development area in earlier years - where no restitution of breeding facilities was undertaken (as far as we know). Equally important is the <u>migration</u> of the frogs. Currently, the construction of brick walls with no access points (in particular on the North and Western side of the pan, in Glen Austin), almost preclude their natural migration. There will be higher attrition levels when crossing and migrating along tar roads, than even at the present time. Current survival rate is only 1-2%. Many of these concerns apply to avian breeding/ ongoing survival. A buffer zone of 32metres / 1km for buildings, is no buffer zone at all – Bullfrogs migrate over kilometre distances. Kindly investigate this.</p> <p>Devaluation of property values On a national level, some 4m taxpayers currently support 16million people on grants. As government continues to hammer the broad middle base of tax/ ratepayers, so this equation</p>	<p>The development is immediately adjacent to Kaalfontein which lies immediately adjacent to Tembisa.</p> <p>Work opportunities will be generated during the construction and operations phases.</p> <p>Noted.</p> <p>The pan is recognised as an important feature in the province and will be protected.</p> <p>Noted – however, the application must be reviewed on its merit and cannot be valued on its impact on a national tax base.</p>

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			<p>becomes more untenable. Do not drive down property values and with it, drive out valuable ratepayers. A significantly smaller, lower density development of medium cost housing for a broader cross-section of the population, may be a more equitable compromise and earn the municipality more in the longer term.</p> <p>Farming Refer item 5.1 alternatives and motivation. Despite the negative reference to agricultural use, farming still forms the backbone of the economy in many parts of the country. Various examples of farming project are evident in the Glen Austin area and more ventures should be encouraged, not discouraged. It is a pre-requisite for any nation to feed its people. Refer farming ventures on Pitzer Road, Olifantsfontein Road, President Park (which includes a fish farm and vegetable production), Cresset House, etc. (photos to follow).</p> <p>Enforcement of regulations As plot owners, we are currently experiencing several glaring examples of the incompetence / impotence/integrity /disinterest /of the Johannesburg municipality to enforce their own regulations, opposite building development in Glen Austin. These have implications on the entire grading of Glen Austin as an "Agricultural Holding" area. For example, the industrial site on the corner of Belvedere and Douglas Roads to the immediate west of the pan – it is an aesthetic eyesore, which has no place in a residential area, but which has remained in situ for some 8 years. No EIA was conducted and there are ongoing concerns re potential spillage of chemicals/ contaminated effluent run off and noise pollution. (Specific details available to any interested parties). It is hardly likely that the Municipality will have any greater commitment to proposed enforcement of environmental / other concerns in this new development.</p> <p>Security Reference has been made to short term security concerns during construction (7.4.2 of the scoping document). The development, as outlined, may have far greater <u>long term security</u> considerations, however, for the current and future residents. Security awareness peaks and troughs according to the latest incidents, but the problem is ever present (refer to latest Midrand reporter dated 23 Oct 2014). This is especially true, if low cost housing is erected and shacks built alongside these, for some who are unemployed or even unemployable. A drive past Diepsloot or the development in the vicinity on Allandale Road, east of Carstenhof Hospital, will illustrate the point.</p> <p>In Conclusion As committed Christians, we accept that we do not, in truth, own anything, but are custodians of God's creation. Nevertheless, we would like to be competent custodians, conserving what we can for future generations.</p>	<p>Noted - However, the application must be reviewed on its merit and cannot be valued on its impact on the national farming status quo.</p> <p>Urban agriculture in a development of this nature will always be encouraged.</p> <p>Noted. The ward councillor is the best person to address the experiences in Council.</p> <p>The security is addressed under EMP for the construction and operations phases.</p>
46.	Cedric Bessit	27/10/2014	<p>Please see below extraction from comments by others, which I also agree with, specifically my issues are in relation to:</p> <ul style="list-style-type: none"> controlling and monitoring of groundwater pollution considering most persons in the area depend on groundwater for animals. How will sewer collection and treatment and stormwater management be done for the development? entry and exit roads for traffic to and from the new development, considering existing Van Riebeeck is un-tarred. Has a traffic impact assessment been completed? Not to mention potential dust pollution, if this road is to be 	<p>Since no water will be taken from the groundwater sources for the development, the underground sources will not be affected by this development.</p> <p>A full traffic report will be conducted as part of the specialist reports for the development proposed.</p>

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			<p>accessible.</p> <ul style="list-style-type: none"> • we are supplied directly by Eskom power meaning that although the development will be in Ekurhuleni as oppose to Johannesburg (where we reside) there may be significant additional loading on our existing cables. • What is the minimum distance that residential development can be done to an existing and operational landfill site? Is there some degree of screening required? <p>Annexures to Comments:</p>	<p>A full electrical engineering report will be conducted as part of the specialist reports for the development proposed.</p> <p>As per the guidelines of the GDARD and depending on the uses of the landfill the buffers are from 100m to 1000 m</p>

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			<p style="text-align: center;"><u>ANNEXURE A.</u></p> <p style="text-align: center;"><u>COMMENTS ON THE DEVELOPMENT ON STRYDOMS FARM</u></p> <ol style="list-style-type: none"> 1. No development should take place within 1 km radius of the Glen Austin Pan. 2. Dale Road, Allen Road and Modderfontein Roads to be upgraded and widened. 3. There will be a marked Devaluation of properties on the East side of Glen Austin. 4. The GA Pan could be destroyed with pollution from the development. Once it is gone, it is gone forever. 5. Once RDP houses are built, there is no control and shacks get attached to them for renting out. Litter, Overpopulation will become a problem. Noise will be a problem. 6. What type of roads will be built within the development to cater for this huge development? And where will the access points be? 7. Will power cables be overhead or underground. 8. Please provide detailed development plans. 9. More information required about the Developer. 10. Who is the backer – last time it was Nedbank. 11. Who now owns the land? 12. Impact of dust and noise during the development. 13. Lots of concrete and roads and where will the water drain to. 14. Contamination of boreholes. 15. Roads planned for over the wetland and underground fountains will have to be on stilts. 16. Wetland delineation should be done and buffer zones should be established around the wetlands. 17. Groundwater impacts. 18. The impact of sewerage on water is of concern – residents in some instances have boreholes only. 19. Preservation of the Bull Frog. 20. Preservation of Grass Owls. 21. Flamingos and other birds visit the pan during the summer - a development will stop this. 22. Protection of indigenous flora and fauna. 23. Protection of snakes – a rare snake was released there recently. 24. Dolomite study should be done. 25. Traffic congestion will be increased for Midrand. 26. Who is going to monitor and prevent Crime during construction? 27. Power supply already under pressure, the impact on power provision should be considered 28. Where will the sewerage works be. 29. The specialist studies should be done by an independent party. 30. Broaden the public awareness process. 31. The developer should be present at meetings. 32. Consultation should be done with Caroline Yetman – Bullfrog specialist and Paul Farrell – wetland specialist. 33. What type of walling will be erected around the entire proposed development? 	

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			<p>Annexure A</p> <p>Addition to Public Participation Process</p> <p>JHC Sasser / Sasser Family Trust</p> <p>My comments regarding the proposed school on Eagles Nest X12</p> <ul style="list-style-type: none"> Access to the school via the service road off R82 Environmental impact considering the area neighbours a green belt area Electricity supply issues – the whole area is currently under severe electric strain with constant power interruptions due to poor infrastructure in our area Water supply – water in the area comes 18km far from Mondor connections – we have a constant issue with water pressure Sewerage – there is no sewerage and the whole school would have to run on septic tanks – that I extremely impractical for a school Potential traffic disaster – we have 60 units in Eagles nest estate and this already causes traffic issues in the mornings and evenings. Additional traffic in and out of the main road will most definitely start causing accidents. It is not possible to put a robot on the intersection as there is a robot less than a kilometre down the R82. Another robot will cause unnecessary pressure on an already busy main- <p>Details: <i>Mr C F Krog</i> <i>POBox 50765</i> <i>Randjesfontein</i> <i>1683</i> <i>No 39 Van</i> <i>Riebeeck Road</i> <i>Glen Austin</i> <i>Midrand</i> <i>Email: carlkrog@gmail.com</i></p> <p>Comments as follows:</p> <ol style="list-style-type: none"> 1) Conservation issues - Frogs, Fauna & Flora etc. 2) Development of this nature even if management of surrounding ecological areas is put in place, they are never managed after the development is handed over. The people occupying this sort of development do not take into consideration any conservation boundaries etc. Rubbish dumped anywhere, shacks and informal housing rises up all over the place, informal business on the side of the streets and to the entrance of these developments. Increased traffic with taxis and motor vehicles parked all over the show at the entrances to these developments. Something that clearly will affect the ecological, tranquility and surrounding area of Glen Austin. 3) Over population - people move in over and above what the development caters for. 4) Water table that will be affected by pollution etc. Taking away of vegetation that assists our table. The residents use boreholes for irrigation and drinking water. 5) Power and its implementation. 6) Our lifestyle in the area will change completely. We live in Glen Austin for its tranquility, where we can enjoy our horses and animals etc. 7) Crime will definitely rise! 8) Value of our properties will decline to Zero, loss of investment and lifestyle. 9) Depreciation of surrounding properties. <p>I suggest the following clearly takes precedent in the EIA process:</p> <ol style="list-style-type: none"> 1) Proper investigation into market value of existing properties 2) The study of present developments of this nature which will clearly indicate that a development of this nature cannot be built in the designated area! 3) Alternative areas needed to be looked at! 4) The developers main concern be financial 5) Developer is to appoint the persons required for the necessary studies but chosen by an independent party. 6) I as a resident of Glen Austin am clearly against the development of the area due to the concerns of the total ruination of the designated ecological areas once development handed over. Other developments of this nature have shown this. 7) The environmental impact assessment done in 2009 is referred to. 	

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47.	Carl and Shirley Winter	27/10/2014	Shirley (shirleyannwinter@gmail.com) and I object to this development on the same grounds as before.(i.e. environmental and legal etc.)	Noted.
48.	Henry Krog	27/10/2014	<p>There seems to be some impact studies still outstanding.</p> <p>The main issue is the impact this low cost housing development has on the community to the west of proposed development. The developers are only interested in their own pockets. I have seen developments of this nature turn into shanty towns allowing uncontrolled building of additional rooms on very small properties for rental. The development mushrooms 4 to six times the size it should be catering for. The surrounding area is largely affected with increased crime, uncontrolled pollution and traffic way beyond what the environment can cope with. This will lead to the pollution of our water tables in the area and our pans etc.</p> <p>No mention has been made as to what will be put in place to assure that the community of Glen Austin will be protected and its own environment remains intact.</p> <p>Our spatial development plan saw to it that the K109 would run through Strydom farm and not on Van Riebeeck Rd. Thus creating an agricultural barrier and Bird sanctuary which in turn will protect the pan. Glen Austin needs to remain separate from any development in the area and the developers should come up with the necessary plans to do so. This should take place before any development could go ahead. Closing off Glen Austin on the western side above van Riebeeck Road and the pan – take a look at the spatial development plans for the area.</p> <p>Our concerns for our life style should also be addressed without us standing in the way of housing for others. I hope that all parties concerned can find a way to work together.</p>	<p>The impact studies are being compiled based on the feedback from the public. The issues that are addressed are stipulated by the minimum standards for reporting as described by GDARD nad these are supplemented by the feedback from the public comments to ensure that all the aspects are adequately addressed.</p> <p>Copies are being obtained for review. The legal standing of this document is also being determined.</p> <p>Noted.</p>
49.	Trevor Stacey	27/10/2014	<p>The issue of real concern for me is the high density of development and the closeness to the Bullfrog pan. I cannot see how we can mitigate the impact of bringing any type of humanity closer to this sensitive area. An environmental impact study will examine what happens to humanity but as we know all classes of humanity have a tendency to go over the top and do unexpected things and the proximity to the pan and the fact that the pan is downhill of the development in question does not bode well for the pan.</p> <p>We know that the frogs migrate away from the pan if one looks at the roads around Glen Austin to see the number slaughtered on the existing roads.</p> <p>We humans have an unfortunate habit of challenging nature in new and creative ways. This development is just too close for comfort, foot and road traffic will increase, fences get broken (removed) and I can see people taking shortcuts "home" through this very sensitive area.</p> <p>We also have a reputation for poor maintenance and I would think that this development will be the same leading to more danger to the pan.</p> <p>Storm water (and associated pollution from poorly maintained hygiene structures) will also cause potential damage to the pan. Why risk it?</p>	<p>The Glen Austin Pan is a provincial importance and will be protected. Measures will be put in place to protect movement and habitat of the bull frogs.</p> <p>Noted.</p> <p>Noted.</p> <p>Noted.</p> <p>The storm water will be designed to address the important ecological value of the Pan.</p>

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			<p>Humans wash and recycle – the pan being downhill will be in grave danger from these human settlements and the storm water that will need to be dealt with and maintained.</p> <p>Development I am not sure that the developer is obviously keen to generate a profit from development. I am sorry but an excuse such as costs to redevelop the farm must pale into insignificance on the cost of developing a township. The motivation seem disingenuous at least and no reason to change the existing restrictions and zoning. The land could be leased to a real farmer if the current owner cannot or more likely does not want to farm</p> <p>Surrounding areas and development The requirement for high density housing also seems to be used as a City requirement? Midrand we are told is the fastest developing suburb in South Africa. There are plenty of sites and development happening to the west of the N1 (Lever road, Kyalami and Blue Hills area) which seem to cater for multi-level/medium density housing. The East is low density and agricultural and provides an industrial belt along the N1 Highway and R101 and then we have low density and green belt for the area and the city to breath. Development should be kept low density around this area in order to balance the overuse of land in the east by Tembisa and Ivory Park.</p> <p>The area has several wild animals in the area apart from the bullfrogs; bringing humans closer will lead to an even greater destruction of this wildlife.</p> <p>Traffic Dale Road and Glen Austin roads are all traffic nightmares at the moment in peak hours with low-density living. How many roads will need to be built to ease the congestion?</p>	A traffic impact assessment is being completed to address the potential impacts of the generated traffic.
50.	Cebolenkosi Mhlongo, Johannesburg City Parks and zoo, Environmental Protection unit. .		<p>Johannesburg City Parks and Zoo (JCPZ) is a municipal entity within the City of Johannesburg which is responsible for the development and maintenance of Public Open Spaces, Parks, Road verges and Cemeteries within the jurisdiction of Johannesburg Metropolitan Municipality.</p> <p>JCPZ examined the submitted Draft Scoping Report in terms of environmental legislation and other applicable policies, procedures and town planning related criteria, location, surrounding land uses, proximity to conservation areas and areas of ecological importance, and alignment to environmental standards; and the following is applicable:</p> <ol style="list-style-type: none"> 1) Compliance with town planning requirements and open space provisioning of 10% of the total site to be allocated as Public Open Space which excludes rivers, wetlands, ridges and other areas which are already protected by relevant environmental legislation. 2) Establishment of a network of ecological and recreational open spaces as the identified area and according to the Open Space Masterplan, the identified properties are located in an area with a shortfall of functional, ecological and recreational Public Open Spaces in line with 2.4ha per 1000 people requirements. 3) Submission of technical and specialists studies as per EIA requirements to determine the impacts on the receiving environment, which include the status quo of rivers and wetlands, groundwater movement, ground and surface pollution, the long-term seepage impacts on the wetland, biodiversity, water table and birdlife assessment, 	<p>Noted.</p> <p>Noted. The requirement for provision will be provided to the Town planners to include.</p> <p>Noted. The requirement for provision will be provided to the Town planners to include.</p> <p>The draft EIA with the specialist studies will be circulated for review.</p> <p>A site layout will be provided.</p>

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			<p>services such as stormwater management, roads, electricity, water and sewer, the potential impacts and mitigation measures.</p> <p>4) A comprehensive site layout plan that outlines the proposed activities, and information of the existing activities that will be expanded to be indicated on the layout plan.</p> <p>5) Development of a network of fully functional recreational and greenbelt open spaces, which include community parks and/or regional parks for the benefit of the surrounding community.</p> <p>6) To prevent waste disposal on Public Open Spaces, City Parks recommends an EMP, to address the management of domestic waste, waste disposal and collection measures; and to encourage waste recycling and provide adequate space for waste separation at source measures.</p> <p>7) The agricultural potential of the site, the soils properties and dolomitic conditions be assessed further. Land parcels and areas allocated as part of the citywide initiatives such as Food Resilience programmes, Waste Recycling and Buy Back centres etc.</p> <p>8) An ecological sensitivity map used to assess the ecological sensitivity of the site, sensitivity map indicating the rocky outcrops, Eskom servitudes, proposed roads etc.</p> <p>9) Information from studies done to investigate the requirement, planning, alternatives and potential impacts of services such as storm water management, road access, road network and future upgrades, electricity, potable water provision and sewer connections.</p> <p>10) All activities on site must comply with the Local Authority By-Laws and other applicable legislation.</p> <p>11) A comprehensive storm water management plan, which incorporates the Sustainable Urban Drainage (SUD's) principles, to manage storm water on site and minimize the impacts must be compiled in line with the City of Johannesburg Metropolitan Municipality's requirements and standards. Stormwater management plan to be provided and alternative of on-site attenuation to alleviate pressure on existing stormwater network and associated sewer infrastructure.</p> <p>12) A landscaping plan must be designed and submitted to Johannesburg City Parks for approval prior to any commencement of any construction activities. This plan must include the use of indigenous vegetation to visually screen the proposed development from residential areas in the vicinity.</p> <p>13) Assessment of areas of historical significance on the site, heritage Assessment will assist in the location of historically significant sites and their significance. Should any heritage resources of any nature be uncovered during development, SAHRA or a professional Heritage Specialist must be contacted immediately for investigations.</p> <p>14) Dust impacts during construction and post construction, and noise reduction measure to be addressed in the new township establishment through tree planting along the boundaries and in the peripheries of the township as a noise barrier.</p> <p>15) The applicant shall be responsible for ensuring compliance with the conditions contained in this letter by any person acting on his behalf including but not limited to contractors and consultants.</p> <p>16) GN Reg 544, Activity 24 refers to the transformation of land bigger than 1000 square metres in size, to residential, retail, commercial, industrial or institutional use, where, at the time of the coming into effect of this Schedule or thereafter such land was zoned open space, conservation or had an equivalent zoning.</p> <p>17) Clearance of indigenous and endemic vegetation and local trees to be minimised and avoided and/or a tree replacement strategy be in place as part of beatification and</p>	<p>Noted. The requirement for provision will be provided to the Town planners to include.</p> <p>Noted. The requirement for provision will be provided to the engineers and planners to include.</p> <p>Open spaces will be allocated and could be used for the indicated programs.</p> <p>A sensitivity map will be provided.</p> <p>Noted. The requirement for provision will be provided to the engineers and planners to provide.</p> <p>Noted.</p> <p>Noted. The requirement for provision will be provided to the engineers and planners to provide</p> <p>Noted. The requirement for provision will be provided to the designers and planners to provide</p> <p>A heritage assessment has been completed and the requirements from the PHRA will be included.</p> <p>Dust will be addressed in the EMP for the construction and the operations phase</p> <p>Noted</p>

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			landscaping the new township.	
			18) Measures to be in place for borehole and natural spring's protection and long term monitoring strategy to be implemented.	Noted we will confirm to include this listed activity .
			19) The Hydrological Study is required to understand the quality, surface and ground water resources. The study will also help understand the potential impacts and identify measures to minimise the impacts. To identify how the new proposed development going to affect the invertebrate species found within the stream.	
			20) Rehabilitation or relocation plan of indigenous fauna species should also form part of the report. The proposed project will cause bad impacts on the habitat of unique African Bullfrog, therefore the plan on how the preservation of this species has to be outlined and form part of the final report.	Noted.
			21) Fauna, flora and biodiversity studies will assist with the understanding of the available species on the site and surroundings and the potential impacts.	Since the land will not extract bore hole water it is not envisioned to affect the ground water sources.
			22) Socio-economic assessment will assist with the services requirements such as schools, recreational areas, public open spaces, water, electricity and sanitation of the adjacent communities.	Since the land will not extract bore hole water it is not envisioned to affect the ground water sources.
			23) Crime prevention measures to be in place through incorporating smart cities approach and adequate provision of crime-deterrent measures to minimise security risks on the proposed open spaces and wetland systems.	
			24) Emphasis on wetland delineation and relevant technical studies, impact on the endangered bullfrogs which exists on sites, the establishment and strengthening of the local conservancy initiatives.	Noted.
			25) No development to occur in wetland and river streams; a 32m buffer zone to be kept from wetlands and river streams. Development along the wetlands is strictly prohibited because it leads to destruction of habitat of aquatic species.	The draft EIA with the specialist studies will be circulated for review.
			26) Compliance with legislation where river crossings and encroachment into wetlands is proposed, impact on groundwater table should be investigated.	The draft EIA with the specialist studies will be circulated for review.
			27) Stormwater should not be discharged on Public Open Spaces and watercourse.	Security will be addressed in the EMP for the construction and the operations phase
			28) Roads have to be planned away from the water streams and conservation areas to minimise ecological impacts. The development of roads will cause seriously negative impacts on the indigenous flora and fauna species.	Noted.
			29) Investigation be undertaken to assess the electrical requirement of the proposal and the impacts to the existing users to be minimised. The construction of such infrastructure should be kept away from wetlands, Public Open Spaces, watercourse and conservation areas to prevent negative impacts to the natural environment.	Noted.
			30) Expansion of roads has to be done in such a way that it accommodates 100% of the project capacity and prevent the negative impacts on the natural habitat. Additional roads that might affect Open Space	Noted. – the requirements will be provided to the engineers – storm water will be designed according to the minimum requirements of the EMM.
			31) The traffic impact study is required understand the status of the surrounding areas. The study will help estimate the need for additional roads that will be required for the additional population.	Noted.
			32) The assessment of availability of schools to address the need of additional schools. The proposed project will directly and indirectly have negative impact on the adjacent community and as such a plan on how are they going to minimise such impact has to form part of the report	Noted. The requirement for provision will be provided to the engineers and planners to provide
			33) Air quality assessment has to be conducted to understand the air pollution sources, patterns and implement mitigation measures. Compliance with Air Quality Legislation is required and buffer zones established to comply with the Air Quality regulations.	The EMM base will be used for the air quality assessments.

CLAYVILE X50 SITUATED ON THE REMAINDER OF PORTION 183, PORTION 30 AND PORTION 31 OF THE FARM OLIFANTSFONTEIN 410 J.R – DRAFT EIA

	NAME	DATE RECEIVED	COMMENT	RESPONSE
51.	Mr. H.S Nkosi, Ekurhuleni Metropolitan Municipality, Environmental Resource Management	12/11/2014	<p>The municipality does not have an objection to the report. In commenting on the application, the municipality considered the following:</p> <ol style="list-style-type: none"> 1. The municipality concurs with the specialist studies identified for the proposed development.. 2. The proposed site falls within "Critical Biodiversity Area1" (CBA 1) and "Ecological Support Areas 1 & 2"Categories. Therefore, the proposed vegetation and Giant Bullfrog assessments mentioned in pages 28-29 will establish whether the area is still in its natural state to meet targets for ecological processes or be released for the proposed development. 3. The outcome of the proposed engineering service investigation is crucial for the municipality to establish whether the existing bulk infrastructure in the area will be able to accommodate additional load by the proposed development or not. The said report will be circulated to Roads and Stormwater Department for approval. 4. The proposed stormwater management plan must be compiled by a stormwater competent professional engineer to the satisfaction of the Department of Roads and Stormwater of the EMM. The said plan will be circulated to the Department for approval. <p>However, the following issues from the report need to be addressed:</p> <ol style="list-style-type: none"> 1. On page 32 of the report it is mentioned that electricity will be supplied City of Johannesburg. It should be noted that the proposed development falls within the jurisdiction of the Ekurhuleni Metropolitan Municipality. 2. It is mentioned in the report that an advert was placed in a local newspaper. It is also recommended that as advert be in both English and Afrikaans Languages. 3. The proposed layout map of the proposed development on the property must be attached to the draft Environmental Impact Report (EIR). The said map must clearly indicate sensitive areas and buffers within the proposed development. 4. Traffic Impact Study must be conducted and attached to the draft EIR. The said report will be circulated to Roads and Storm water department for approval. <p>Finally, the Municipality requests that the draft EIR appended with all identified specialist studies be forwarded for review and comments as soon as they are available. Recommendations made in the said studies must be incorporated as mitigation measures in the Environmental Management Programme (EMPr) to be developed for the management of potential adverse impacts during planning, construction and operational phases of the proposed development.</p>	<p>Noted.</p> <p>Noted</p> <p>Noted.</p> <p>Noted – the engineers reports will be provided for review.</p> <p>Noted – the engineers reports will be provided for review.</p> <p>Electricity will be provided by the Ekurhuleni Metropolitan Municipality</p> <p>Noted. the Star will also be utilised</p> <p>Noted, a layout plan with the sensitive areas will be addressed.</p> <p>Noted – the traffic engineers reports will be provided for review.</p> <p>The full d raft with all specialist studies will be circulated for review</p>
52.	Elisabeth Hinke	05/04/2015	<p>In the scoping report for 207 you write on page 24: "There is vacant land, old mining activities, agricultural land, Olifantsstein Road and Midstream estate situated to the north of the proposed site." Old mining activities? I'm not aware of such but since 2009 (9) Interwaste has established a rubble-dump with extraordinary portions along the old sand quarry – it was recently extended and the odour (depending on wind direction) is sometimes so bad, that we only want to leave here... The suggested tonnage of dump material by GDAARD was extended (changed by whom?). The Interwaste stench is even more intense in the zoned area for your proposed</p>	<p>The land fill area is not part of this application and should be addressed with the City Environmental Health Department – it must have an operating license and if they do not meet the requirements of the license they can be issued with a non-compliance notice form the City . Furhter the provincial Department must have issued a Record of Decision and requested to complete an inspection to determine compliance of the operation.</p> <p>Noted</p>

CLAYVILE X50 SITUATED ON THE REMAINDER OF PORTION 183, PORTION 30 AND PORTION 31 OF THE FARM OLIFANTSFONTEIN 410 J.R – DRAFT EIA

	NAME	DATE RECEIVED	COMMENT	RESPONSE
			<p>development.</p> <p>Interwaste shouldn't be there at all as many residential areas around and a rubble dump has a negative impact on the lifestyle and health conditions of the people around (fine dust, bacteria's, bio gas, stench etc., danger for water pollution) as well as the deterioration of property values. As far as I'm informed W. Strijdom has private shares in this dumpsite or leases the land (?). On the other hand he offers the rest of the farm for development for a residential area....</p> <p>a conflict which results in long-term problems for the people living around a dump-site not maintained in a proper way (we have enough dust and odour as proof).</p> <p>I'm sending this as this could be a serious conflict zone and the only winner is Mr. Strijdom. In my opinion Interwaste should be closed in this area.</p>	Noted
53.	Mashudu Ratshitanga, Sub Head: Environmental Impact Management, City of Johannesburg, Metropolitan Municipality	23/04/2015	<p>The proposed township falls within the Ekurhuleni Metropolitan Local Council's jurisdiction, this Department can therefore not comment on any By-Laws, IDP's, RSDF's, policies or precinct plans for the area.</p> <p>The proposed development will take place in close proximity of the Glen Austin Bird Sanctuary which is a proclaimed sanctuary. This is a known site for the Giant Bullfrog.</p> <p>A specialist in Herpetology should conduct a Giant Bullfrog Survey and habitat assessment which should be included in a management plan for the area and included in the EMP.</p>	<p>Noted</p> <p>The Draft Scoping nad Final scoping was sent to the City of Joburg for notification</p> <p>The Glen Austin Bird Sanctuary and an appropriate buffer will be protected.</p> <p>A thorough Herpetological assessment was completed.</p>

Implications:

Comments from the local authority, Ekurhuleni Metropolitan Municipality, City of Johannesburg situated on the western boundary of the proposed site and registered Interested and Affected Parties have been addressed.

14.0 ALTERNATIVES IDENTIFIED & MOTIVATION FOR PROPOSED DEVELOPMENT

The concept of Integrated Environmental Management suggests that an Environmental Impact Assessment process, to determine the possible impact of the proposed activity, should incorporate the consideration of feasible alternatives. A reasonable number of possible proposals or alternatives, to achieve the same objective should be assessed. The identification, description, evaluation and comparison of alternatives are important for ensuring a sound environmental scoping process.

Alternatives should be considered as a norm within the Environmental Process. These should include, as applicable, the demand alternative, scheduling alternative, land use alternative (including the NO-go option), location alternatives and service alternatives.

14.1 DEMAND ALTERNATIVES

Having regard to the size of the proposed development site (approximately 163 hectares), of which the majority is to be developed (the remaining to be private open space measuring approximately 39 hectares), and the location within the Ekurhuleni Metropolitan Municipality to develop the land as a mix use development on Portion 30, Portion 31 and the Remainder of Portion 183 of the Farm Olifantsfontein 410 J.R (Township to be known as Clayville X50) would align to the Ekurhuleni Metropolitan Municipality's needs and demands for housing and complimentary uses. The proposed development will assist in providing accessible employment opportunities, as well as the need for high and low density residential development, therefore creating housing, which is more economical alongside employment opportunities.

Clayville / Olifantsfontein is earmarked for major expansions and development of a regional node. It follows that, in a general sense, the demand alternative only presents two logical alternatives namely:

- To retain the site as open land (the status quo); or
- To develop the land as a mix use development on Portion 30, Portion 31 and the remainder of Portion 183 of the Farm Olifantsfontein 410 J.R (township to be known as Clayville X50) and provide additional housing, business opportunities, upgrading of existing infrastructure, etcetera, therefore increasing economic sustainability in the area. The proposed development will also link the site to surrounding activities and accessible infrastructure to compliment the increasing housing demand in the region or by providing additional mixed-income housing options and business opportunities and would align to the national and local demand for housing needs.

The financial requirement that is necessary to maintain the area as vacant land is rising every year and it is becoming more and more difficult to keep the space free of criminal activities as well as illegal occupants. Therefore events have overrun the option of retaining the land as vacant since the land has been recognised as being suitable for housing and commercial. The financial requirement that is necessary to revive the land's agricultural use is also rising and it is becoming more and more difficult to make a living by farming the lands. It appears that, from a demand perspective, the alternative of developing the land as an infill portion in the area concerned would be appropriate.

14.2 PROCESS ALTERNATIVES

It would appear that the process relevant to the establishment of a development area can only be achieved by way of one of two alternatives, namely:

- An application in terms of the new Gauteng Planning and Development Act No 3 of 2003; alternatively;
- An application in terms of the Town Planning and Townships Ordinance, 1986 (Ordinance 15 of 1986) as read together with the Spatial Planning and Land Use Management Act, 2013 and the Ekurhuleni townplanning Scheme, 2014 (preferred alternative).

The end result in respect of either of the above-mentioned processes would be similar in that the development area will result in the transformation of a portion of land into a housing environment with commercial support services.

Although the Town Planning and Townships Ordinance process is being followed, the value of the new Gauteng Planning and Development Act No 3 of 2003 principles have been realised and responded to. The end result in respect of either of the above-mentioned processes would be similar in that the development area will result in the transformation of a portion of land into a Mixed-use urban complex.

Clearly, methods applied may involve more or less manual labour in certain circumstances. In the development proposal under consideration, manual labour will indeed be feasible having regard to the scale and extent of the development which, in turn, will enhance employment creation and should be preferred as the alternative construction method where practically possible

14.3 SCHEDULING ALTERNATIVES

The development of a mix use development of the scale and nature proposed by the land development applicant is not specifically sensitive to weather patterns or cycles. There does not appear to be a more or less preferred time to undertake the physical development associated with a new urban complex in the form of road construction and the laying of infrastructure. Typically, the rainy season (spring and summer) may impact negatively on the construction related activities and may result in "down time". It follows that, if possible, the construction periods should accord with the winter months to avoid down time related to rain.

Following this alternative it may also result in less of an impact on the possibility of top soil erosion during flash thunderstorms and increased runoff where new trenches lie exposed to the elements for a restrictive period of time. However, suitable mitigation methods can be employed to curb washing of storm water into sensitive wetland areas.

14.4 LOCATION ALTERNATIVES

Location alternatives for the proposed development, which constitutes mix uses/residential development such as the preferred activity alternative, include the following:

14.4.1 Inner-city location

An inner-city location would be environmentally and socially feasible, however economically unviable, provided that the same area extent of land be found available for development as inner-city resources are very scarce.

14.4.2 Suburban location

Not socially, environmentally or economically feasible due to the following:

- Not situated adjacent to primary movement corridors
- Not accessible to a range of socio-economic population groups
- Isolated nature of development and therefore not inclusive
- Contrasting densities and heights with regard to the mixed-use nodal development
- Availability of land at an affordable cost minimal

14.4.3 Urban edge / rural location

Although land is available in this location at a lower economic cost, this location is socially and environmentally less feasible due to the following:

- Lack of proximity to social amenities, services and infrastructure
- Locating a nodal development far from other urban facilities
- Loss of land that is environmentally / ecologically valuable
- Creation of urban sprawl

14.4.4 Infill development location (preferred)

This is the most preferred location type due to the balance achievable between social, environmental and economic requirements:

- The land belongs to the Applicant
- Aligns to the prerequisites of the Ekurhuleni Metropolitan Municipality's SDF
- Situated within the urban realm adjacent to existing and proposed urban infrastructure, service and amenities
- Socially inclusive due to its location to numerous communities and along public transport routes

14.5 LAND USE ALTERNATIVES

The following Land Use alternatives have been investigated

14.5.1 Alternative 1: No-go Option

This implies that the site be left as is and that no development or alteration be done. If this alternative is pursued the sites existing habitat will be retained. This option has the following drawbacks:

- The potential to provide additional housing and related economic and social activities, which appears to be in accord with the prevailing land use regime in the area and the thinking of the local municipality to the population, will be lost;

- A very viable opportunity to exploit the limited residential, business, etc. opportunities in the area and creating jobs and income for the local market will be negated;
- The area will fall further in disrepair and the protection and appropriate management of the ecological significant areas will be negated; or
- Agriculture is not an economically viable option due to the location of the site. Virtually surrounded by current and future urban development and the natural location to develop further.
- Illegal squatters or vagrants will remain and further inhabit the site.

Given the fact that the site will eventually degenerate if left unmanaged, and the fact that it is unsuitable to be utilised for grazing or agricultural purposes due to its location, it is reasonable to state that the no-go option is less favourable than some of the other options presented. Furthermore, should this property not be developed it would be left as an isolated and disconnected land due to all the surrounding areas that have already received environmental authorisation and on which development will proceed and the necessary environmental management, mitigation and rehabilitation measures can be implemented.

14.5.2 Alternative 2: Single-use: Low density residential

This option will make provision for the subdivision into “Residential 1” erven only. The result of such a development will be a high income exclusive development where no social responsibility or economic sustainability and job creation can be considered. Limited ecological land will remain as all the land will be taken up by roads or erf portions.

14.5.3 Alternative 3: Light Industrial Development

The introduction of a light industrial development, although suited to the general functioning and land uses, especially in relation to the land uses to the north west, south and south east of the surrounding urban environment and other light industrial areas in Midrand and Olifantsfontein, is considered unsuitable due to the following reasons:

- Over-saturation of a single use activity – there are several pieces of land in the Olifantsfontein industrial areas that are vacant and that can be used for industrial development. These areas are serviced and ready for occupancy.
- Lack of diversity and vibrancy associated with a mixed-use development.
- Due to the sites close proximity to the Glen Austin Pan the risk of pollution of the Pan due to Industrial activities is very large.

14.5.4 Preferred alternative: Mix use Development

The preferred alternative is the mixed Use development on Portion 30, Portion 31 and the remainder of Portion 183 of the Farm Olifantsfontein 410 J.R with ample private open space (preferred alternative).

Figure 2: Proposed Layout. Although, there are many parcels of land available in the Ekurhuleni Metropolitan Municipality area, the land under investigation is owned by the Applicant and conforms to the Ekurhuleni Metropolitan Municipality Spatial Development Framework

The Spatial Development Framework (SDF) of the Ekurhuleni Metropolitan Municipality provides a clear indication of the broad land use pattern to be developed in Ekurhuleni to achieve sustainable spatial

development and to thus overcome the spatial imbalances of the past. The plan is at a level of detail, which clearly provides spatial development guidance at the macro level and yet provides sufficient flexibility for urban planning at the regional and local levels, which will be reflective of the needs of the relevant era.

In order to extract a more detailed indication of the spatial guidance and direction emanating from the policy and institutional instruments developed by the Ekurhuleni Metropolitan Municipality an assessment of the Regional Spatial Development Framework for Region B was carried out.

Region B is favourably located in the Economic Activity and Employment Area of the Gauteng Province. This has the potential to negatively impact on the region should a desirable growth and development strategy not be in place. Furthermore, Region B is in close proximity to the OR Tambo International Airport and is located within the core of the Aerotropolis. This locality further enhances the development potential of the region.

Region B can be described as a multi-centred region as it has multiple locations of economic activity (business and industrial) and human settlements. Urban development in Region B is predominantly west of the R21 Freeway, whilst development east of the R21 Freeway is generally agricultural in nature.

The regions locality, predominant land use and the development pressures are the principal elements which influence the role and function of the Region within the broader metropolitan context. In order to create a development concept for Region B a future vision of the role that it will play in relation to the broader Ekurhuleni Metropolitan Municipality area was outlined:

The function of Region B is to:

- Enhance and protect the existing urban fabric;
- Ensure the seamless integration between new and existing development;
- Integration between urban and agricultural areas;
- Provide for properly planned urban expansion towards the east.

For Region B to develop in a sustainable manner, to absorb the growth and to alleviate the development pressure it was important to prepare for growth and development in advance at a sufficient scale. Therefore the focus in Region B should be on enhancing the accessibility of the region and to diversify and strengthen the economic base.

The proposed site falls within an area classified as an urban development zone. According to the draft SDF “urban development” means residential development inclusive of all social and community facilities as well as business land uses as required for sustainable urban life (i.e. limited retail, consulting rooms, etc) as per the tertiary nodes

The following guidelines are applicable to urban development areas:

- Develop an urban structure of walkable neighbourhoods;
- Foster a sense of place in neighbourhoods through design and clustering of non-residential land uses;

- Provide access by way of an interconnected network of streets which facilitate safe walking, cycling and driving;
- Provide a variety of erf sizes and housing types to cater for the diverse housing needs of the community;
- Incorporate key environmental areas into the design of neighbourhoods for the benefit of all;
- Integrate the design of open space and stormwater management;

For further information please refer to Section 6 of this report and to **Annexure N – Town Planning Motivation**.

15.0 COMPARISON OF ALTERNATIVE LAND USES

Please refer to the Table 9 for comparison of alternatives below, a comparison of the four alternative activities for the proposed development site with regards to layout and densities, engineering and design alternatives, road access, storm water management, waste collection, sewer disposal, impact on the surrounding environment and visual impact. Within this comparison it may be assumed that mitigation measures have been adequately implemented. The impact rating is as follows:

High	-	5
Medium	-	3
Low	-	1
Lowest score	-	8
Highest score	-	40

Table 9: Comparison of alternatives

	Alternative 1: No-go	Consequence or Impact Rating	Alternative 2: Low Density Residential	Consequence or Impact Rating	Alternative 3: Light Industrial Development	Consequence or Impact Rating	Preferred Alternative: Mix use Development Clayville X50	Consequence or Impact Rating
Layout and densities	The site will remain as it currently exists. The potential for the site to fall into disrepair is high, along with inappropriate management / control and the potential for informal settlement invasion. The No-go option is not considered desirable.	Medium – 3 No improvements will be implemented.	A low density layout is monotonous and unresponsive to the SDF and will not create a balance between social, economic and environmental requirements for the growing urban environment.	High – 5 Due to lack of diversity and vibrancy and responsive-ness to city requirements	Monotonous and mono-functional. Unresponsive to the RSDF and will not create a balance between social, economic and environmental requirements for the growing urban environment.	High – 5 Due to lack of diversity and vibrancy and responsive-ness to city requirements	A mix use development with a layout that is responsive to the Ekurhuleni Metropolitan Municipality's requirements creating a balance between environmental, social and economic requirements. Optimal utilisation of land to promote an accessible development.	Low – 1 Urban design framework that responds to city requirements
Engineering and design	This alternative will not currently require upgrading of	Med-low – 2 No improvements will	Structural and design aspects can be accommodated within	Med-low – 2 The systems will be	Structural and design aspects can be accommodated within	Med-low – 2 The systems will be	Structural and design aspects can be accommodated within	Med-low – 2 The systems will be

	Alternative 1: No-go	Consequence or Impact Rating	Alternative 2: Low Density Residential	Consequence or Impact Rating	Alternative 3: Light Industrial Development	Consequence or Impact Rating	Preferred Alternative: Mix use Development Clayville X50	Consequence or Impact Rating
	engineering services; however no upgrades will be implemented to the benefit of the surrounding area.	be implemented	this proposal. Positioning of services will be strategically planned according to the proposed layout to prevent further impacts on the environment.	designed to function optimally and measures can be implemented to ensure effective monitoring and maintenance	this proposal. Positioning of services will be strategically planned according to the proposed layout to prevent further impacts on the environment.	designed to function optimally and measures can be implemented to ensure effective monitoring and maintenance	this proposal. Positioning of services will be strategically planned according to the proposed layout to prevent further impacts on the environment.	designed to function optimally and measures can be implemented to ensure effective monitoring and maintenance
Road access	To remain as existing. No upgrades will be required and implemented.	Medium - 3 No improvements will be implemented in an area that desperately requires road upgrades	Minimum upgrades to entrances and accesses according to the traffic engineering report. Limited public transport improvement and accessibility due to gated community.	High – 5 Due to gated community structure in an area that should be accessible	Minimum upgrades to entrances and accesses according to the traffic engineering report. During the operational phase there may be an increase of heavy vehicles in the area causing additional damage to the roads	High – 5 During the operational phase there may be an increase of heavy vehicles in the area causing additional damage to the roads	Upgrades of the intersections. Entrances and accesses as well as road upgrades according to the traffic engineering report.	Med-low – 2 Increase in traffic to be accommodated due to surrounding road upgrades
Stormwater management	The storm water is currently managed as sheet flow. The site drains naturally towards the streams, which border the flow. Better management options could be implemented to prevent erosion.	Medium - high– 4 No storm water management will be implemented, which could worsen erosion on the site and contribute to pollution of the watercourse situated on the eastern boundary of the proposed site.	Storm water management via a storm water drainage system composed of storm water inlets and pipes along internal roads which connecting to attenuation structures. No water will be released into natural systems without retention and slowing down of the	Medium – 3 Effective storm water management can be implemented	Storm water management via a storm water drainage system composed of storm water inlets and pipes along internal roads which connecting to attenuation structures. No water will be released into natural systems without retention and slowing down of the	Medium –high - 4 Effective storm water management can be implemented, however due to the industrial nature of the of the stormwater runoff there is an increased risk of pollution of the wetland areas identified on site.	Storm water management via a storm water drainage system composed of stormwater inlets and pipes along internal roads which connecting to attenuation structures. No water will be released into natural systems without retention and slowing	Med Low – 2 Effective storm water management can be implemented

	Alternative 1: No-go	Consequence or Impact Rating	Alternative 2: Low Density Residential	Consequence or Impact Rating	Alternative 3: Light Industrial Development	Consequence or Impact Rating	Preferred Alternative: Mix use Development Clayville X50	Consequence or Impact Rating
			water. Accumulated storm water can be utilised for irrigation of open spaces.		water. Accumulated storm water can be utilised for irrigation of open spaces.		down of the water. Accumulated storm water can be utilised for irrigation of open spaces	
Waste collection	No waste management strategies are currently being implemented.	High – 5 No improvements will be implemented. Illegal dumping will continue	Refuse removal to be provided by the Ekurhuleni Municipality, however waste is to be minimised by the provision of waste transfer stations	Med-low – 2 Effective waste management due to structure and management by Body Corporate.	Refuse removal to be provided by the Ekurhuleni Metropolitan Municipality, however waste is to be minimised by the provision of waste transfer stations	Medium High – 4 Due to hazardous waste risk	Refuse removal to be provided by the Ekurhuleni Metropolitan Municipality, however waste is to be minimised by the provision of waste transfer stations	Med-low – 2 Effective waste management due to structure and management by individual land parcels and the incorporation of a homeowners association, which duties will include but not be limited to supervision of waste management
Sewer disposal	No additional requirement.	Medium – 3 No improvement to system in the area	Improvement of municipal sewage reticulation system. Increase on load.	Medium – 3 Less time for expansion due to probably once-off roll out	Improvement of municipal sewage reticulation system. Increase on load.	Medium – 3 Less time for expansion due to probably once-off roll out	Improvement of municipal sewage reticulation system. Increase on load	Medium – 3 Phased nature of development will ensure the correct and timeous planning associated with the potential requirements for upgrading of sewer system
Impact on surrounding environment	No change expected other than the potential degradation that could be resultant of poor site management, illegal informal occupation,	Med – 3 No change, however possibility of illegal squatters and illegal dumping	Impact on the environment is mitigated due to the provision of adequate open space for ecological connectivity and	High – 5 A definite change in land use, although strict access control with no surrounding community access	Impact on the ecological environment is mitigated due to the provision of adequate open space for ecological	Medium high - 4 A definite change in land use. Impact on the ecological environment is	Impact on the ecological environment is mitigated due to the provision of adequate open space (approximately	Med-low – 2 A definite change in land use, along with a mix of economic and social land uses that will benefit

	Alternative 1: No-go	Consequence or Impact Rating	Alternative 2: Low Density Residential	Consequence or Impact Rating	Alternative 3: Light Industrial Development	Consequence or Impact Rating	Preferred Alternative: Mix use Development Clayville X50	Consequence or Impact Rating
	illegal hunting and illegal dumping		preservation. No surrounding community benefit as the development will most likely be gated and inaccessible with no economic and social facilities that are available for surrounding neighbourhoods.		connectivity and preservation.	mitigated due to the provision of adequate open space for ecological connectivity and preservation. Greater pollution hazard of surrounding environment, such as increased pollutants contained in storm water runoff	9,1362 hectares) for ecological connectivity and preservation. The community will benefit due to the provision of various commercial enterprises, the improvement of bulk infrastructure as well as various job opportunities.	surrounding community Mitigation measures to prevent negative impacts in respect of ecologically sensitive areas will be implemented as part of the Environmental Management Plan.
Visual impact	Visual impact will not change.	Low – 1	Unilateral and monotonous mass of development. Lack of diversity and vibrancy	Med – 3 Can potentially be mitigated with greening	Visual impact of monotonous industrial activities. Haphazard building forms, materials and colours. Due to the land use type not much aesthetic design detail is considered. High lighting pollution.	Medium high - 4 Can be mitigated via strict design guidelines	Vibrancy and diversity associated with mixed-use character under an umbrella of guidelines (materials, lighting, greening, forms, etc)	Med-low – 2 Architectural guidelines and aesthetic requirements
IMPACT SCORE		25		27		31		17

16.0 POTENTIAL IMPACTS

16.1 METHODS USED TO IDENTIFY POTENTIAL IMPACTS

A combination of the following methods was used to identify impacts during the Scoping and EIA Processes:

16.2 SPECIALIST STUDY FINDINGS

All the legally required specialist studies were conducted (as required by GDARD as per DEA guidelines). Often more than one study was conducted in the same discipline to verify or to supplement findings. The findings of such specialist studies highlighted potential impacts on protected or endangered species and/or environments. The following shows a list of the impacts according to specialist studies:

Table 10: Possible impacts according to specialist studies

SPECIALIST STUDY	IMPACT IDENTIFICATION
Geotechnical	<p>The Geotechnical investigations have confirmed that potentially problematic soils mantle the bedrocks over the site area.</p> <p>Possible foundation solutions are further complicated by the possible presence of “hard” and “soft” materials immediately beneath individual footprints as a consequence of local rock sub outcrop. It is recommended that all soils are precompacted below foundation works.</p> <p>Recommended alternate foundation design solutions for single storey masonry structures are provided in the NHBRC “Standards and Guidelines”. However as many of these erven are likely to be developed with double storey structures it is recommended that the engineered rationally designed foundations are adopted on this site.</p> <p>It is further recommended that all layout plans for this development are reviewed on an ongoing basis and finally certified by the geotechnical specialist as being in accordance with the findings detailed in the geotech report. It is recommended that a competent specialist is always invited to inspect excavation works for services, etc. during the development of this site.</p>
Agricultural Potential	<p>The following conclusions can be made:</p> <p>Irrigated crops: No land is presently under irrigation, there is also no water available.</p> <p>Rainfed crops: The property has only 21 hectare medium to high potential soil. Further, no land was found to be high potential for rainfed cropping according to the departmental guidelines.</p>

SPECIALIST STUDY	IMPACT IDENTIFICATION
	<p>The main constraints to viable crop farming are the soil properties.</p> <p>The site is suitable for livestock, but the income that can be derived from the number of cattle that the property can keep, is not high enough to cover overhead costs if the farm was managed as a financial venture.</p> <p>The financial analysis indicates that the gross farm income before overheads and payment of loans, is at best R134 076 per year, and the net farm income is a loss of R57 648.</p> <p>In conclusion, the property is not a viable farming unit and no additional impact on the Agricultural Potential of the proposed site is expected.</p>
Flora	<p>The site is situated in the Bankenveld Veld Type as described by Acocks (1988). Low & Rebelo described the vegetation of the area also as Rocky Highveld Grassland. In the new vegetation map of South Africa (Mucina & Rutherford. 2006) the area falls within the Egoli Granite Grassland.</p> <p>The area is topographically a uniform, slightly sloped plain, mostly covered with old fields, planted pasture, secondary Anthropogenic grassland and wattle plantations.</p> <p>Due to decades of habitation, the natural vegetation was long ago transformed into agricultural fields now replaced by secondary grassland, wattle plantations and sand and granite mining activities.</p> <p>Other relevant studies in the area include those of Bredenkamp & Brown (2003), Bredenkamp et al. (2006) and Grobler et al. (2006).</p> <p>The following vegetation units were identified on the site:</p> <ol style="list-style-type: none"> 1. Old Fields & <i>Eragrostis</i> Planted Pasture (low sensitivity) 2. Secondary Anthropogenic <i>Hyparrhenia</i> Grassland (low sensitivity) 3. Transformed Secondary Grassland (low sensitivity) 4. Extremely disturbed areas (low sensitivity) 5. Alien Plantations (low sensitivity) 6a. Pan Wetland (high sensitivity) 6b. <i>Eragrostis</i> Wetland Fringe (high sensitivity) 6c. <i>Stoebe</i> Disturbed Pan Area (high sensitivity) 7. Old Mining Area (low sensitivity) 8. Spruit (high sensitivity) <p>Apart from the pans and the spruit, which has been indicated as having a high sensitivity, the entire site is highly disturbed or transformed. It is suggested that the development can be supported, provided that the pans and spruit be protected in green areas within the development plan.</p>

SPECIALIST STUDY	IMPACT IDENTIFICATION
Fauna	<p>The majority of the study area has undergone transformation due to the historic and on-going anthropogenic activities within the study area as well as immediate surroundings. This has led to the reduction of viable faunal habitat for indigenous species, resulting in only species, which have adapted to cohabitate with humans or be tolerant of habitats affected by anthropogenic disturbance presently expected within the study area.</p> <p>Due to the location of the study area as well as the current habitat conditions no SCC (Species of Conservational Concern) are expected to inhabit the study area. However the presence of the Giant Bullfrogs <i>Pyxicephalus adspersus</i> was confirmed. According to the IUCN Red List the Giant bullfrog is listed as least concern. However an amphibian assessment was completed and potential impacts are addressed below.</p>
Amphibians (Giant African Bullfrog)	<p>Principles considered in the Giant Bullfrog Assessment</p> <ul style="list-style-type: none"> • Principle of social need – housing and economic development is imperative • Principle of ecological process – conserving ecosystems is more important than single species but the latter are indicators of healthy systems. • Principle of landscape assessment <p>The proposed development will have the following impacts if no mitigation measures are put in place:</p> <ul style="list-style-type: none"> • Breeding sites will be disturbed / damaged • Foraging grounds and burrowing habitats will be reduced • Road kills and general disturbance will reduce Giant Bullfrog Populations. • Dispersal corridors will be closed and the breeding population will be confined • Excavation will damage the perched water table and wetland seepage system. <p>The proposed mitigation measures as indicated in the Environmental Management Plan must be implemented.</p> <p>Furthermore it must be insured that when the K109 is constructed that the necessary measures</p>
Wetlands	<p>The wetland and site generally have been severely locally impacted. These impacts include:</p> <ul style="list-style-type: none"> • Dumping (litter and building rubble) and infilling; • Excavation (sand burrowing) resulting in extensive erosion and head cutting in some places; • Encroachment of alien invasive plants:

SPECIALIST STUDY	IMPACT IDENTIFICATION
	<ul style="list-style-type: none"> • Sewer line inside the wetland area; and • Road crossing, culverts and excavations resulting to extensive erosion and head cutting in some places. <p>The current assessment found that four of the wetlands remained on site, with approximately the same extent and Present Ecological Status as was recorded in 2009. The easternmost seepage wetland could not be verified since topsoil has been lost and the hard plinthic layer (ferricrete) has been exposed in this area, to such a degree as to remove any remaining wetland indicators (both soil and vegetation). Wetland conditions were however recorded in the center of the site, in the form of seepage water with a rusty brown/oily colour. Various hydrophytic plant species such as sedges were also recorded here. This wetland area was not reflected in Batchelor (2009).</p> <p>A 32m buffer must be implemented for each of the aforementioned wetlands and the Environmental Management Plan must be implemented.</p>
Cultural Heritage	<p>Except for the two Ndebele farm workers settlements no other important cultural heritage resources or graves have been found on the proposed development site. The two farm workers settlements are important and should be fully recorded in a Phase II cultural heritage resources impact assessment before an application can be made for demolishing permit.</p> <p>If during construction any cultural heritage resources or graves are unearthed all work has to be stopped until the site has been inspected and mitigated by a cultural heritage practitioner.</p>
Traffic Impact	<p>The proposed development is expected to generate approximately 5061 trips and 5870 trips (in and outbound) during the Weekday AM and PM peak hours respectively on the external road network.</p> <p>It is proposed that the development be served by two primary accesses off the planned future K109 route. The secondary access to the proposed development is off Main Road (planned future K111 route) and Thabana Ntlenyana Drive. Furthermore a future access is planned 500m north from K111/Thabana Ntlenyana Drive intersection.</p> <p>From the analysis performed, it was found that the impact of the proposed developments can be mitigated by means of a number of road and intersection improvements. The 2020 background traffic plus latent rights traffic show that there is an existing capacity constraint. Therefore the developers of the latent rights developments are required to contribute towards roads and intersection upgrades. The upgrading will be as per the requirements of EMM and GDRT.</p> <p>The following existing intersections will require improvements:</p> <ul style="list-style-type: none"> • Olifantsfontein Road (R562)/Olifantsfontein Road

SPECIALIST STUDY	IMPACT IDENTIFICATION
	<ul style="list-style-type: none"> • Olifantsfontein Road (R562)/Main Road (Future K111) • Main Road (Future K111)/Thabana Ntlenyana Drive • Main Road (Future K111)/Riverside Street • Main Road (Future K111)/Karee Street • Dale Road/Archerfish Drive • Dale Road/Modderfontein Road <p>The following new intersections external to the development are required:</p> <ul style="list-style-type: none"> • Olifantsfontein Road (R562)/K109 (Intersection A) • Access Road (R562)/K109 (Intersection B) • Access Road (R562)/K109 (Intersection C) <p>The road and intersection upgrades will be in accordance with the phasing of the project.</p> <p>The following are required in terms of Non-Motorised & Public Transport</p> <ul style="list-style-type: none"> • It is recommended that K109 be provided with a pair of public transport lay-bys in the form of bus and taxi stops at each access point where access to the township is gained. It is further recommended that the proposed lay-bys be constructed to the appropriate design standards of the relevant roads authority. • In order to ease and formalise the movement of pedestrians between site accesses and the recommended lay-bys, it is proposed to construct at least 1.5m wide paved (or dust free) sidewalk along at least one side of all roads within the development. <p>From a traffic engineering perspective, the proposed development is thus regarded as feasible and sustainable if the aforementioned is implemented.</p>
Services provision	<p>Communication with the applicable municipal departments will be maintained to ensure adequate supply plans without hindering the supply to the surrounding areas.</p> <p>Bulk services are available, or will be available along with required upgrades. The appropriate links will be installed to these services.</p> <p>No additional impact is expected with the implementation of the Environmental Management plan</p>

16.3 SITE INSPECTION

The environmental consultant and specialists conduct several site visits and identified potential sensitive environments. These areas are then red-flagged to be investigated further and excluded from development.

16.4 PUBLIC PARTICIPATION

Conducting public participation produces an issues list. Such a list needs to be screened for relevant impacts which then need to be addressed by specialist studies or identified for further investigation. A very comprehensive public participation process was followed, including a public meeting.

16.5 GDARD POLICIES, REVIEW / TERMS OF REFERENCE

GDARD C-Plan 3 as well as the policies provides the red flags that must be investigated by the specialists. Furthermore, the GDARD officials and the different sub-directorates within the department review the application and give comments to the relevant environmental officer. The issues identified are forwarded to the environmental consultant and these issues are addressed or translated as impacts.

16.6 IMPACT SUMMARY

Environmental impacts can be classified according to physical impacts, bio-physical impacts and socio-economic impacts and can occur during the construction and / or operational phases.

16.6.1 Physical Impacts

- Geological impacts
- Topographical impacts
- Air quality
- Soil and land capability
- Water quality and availability – surface and ground water

16.6.2 Biophysical

- Impacts on flora and flora habitats
- Sensitive landscapes (flood plains)

16.6.3 Socio-economic Impacts

- Cultural and historical significance
- Noise pollution
- Visual impact
- Sites of cultural significance
- Safety and security
- Impact on ambience of the area
- Traffic increase on roads
- Services being inadequate and malfunctioning (including electricity, waste management, water, sewage management systems)
- Run away fires due to poor fire management and lack of capacity to fight fires.
- Improved tax base
- Bulk contributions which result in the improvement of infrastructure in the area

16.7 ASSESSMENT OF IMPACTS

16.7.1 Definition of terms

Construction Phase: All construction or related activities, from occupation by the contractor, until the contractor leaves the site.

Operational Phase: All activities related to and including the operation and maintenance of the proposed development.

Nature: The type of effect the specific activity will have on the environment

Probability: Degree of certainty of impacts

Duration: Lifetime of the impact

Scale: Spatial scale of the impact

Magnitude: Degree/severity of impact

16.7.2 Methodology

The significance of the identified impacts will be determined using the approach outlined below. This incorporates two aspects for assessing the potential significance of impacts (terminology from the Department of Environmental Affairs and Tourism Guideline document on EIA Regulations, April 1998), namely occurrence and severity, which are further sub-divided as follows:

Table 11: Methodology to Assess Impacts

Occurrence		Severity	
Probability of occurrence	Duration of occurrence	Magnitude (severity) of impact	Scale / extent of impact

To assess each of these factors for each impact, the following four ranking scales are used:

Probability	Duration
5 – Definite/don't know	5 – Permanent
4 – Highly probable	4 – Long-term
3 – Medium probability	3 –Medium-term (8-15 years)
2 – Low probability	2 – Short-term (0-7 years) (impact ceases after the operational life of the activity)
1 – Improbable	1 – Immediate
0 – None	
Scale	Magnitude
5 – International	10 – Very high/don't know
4 – National	8 – High
3 – Regional	6 – Moderate
2 – Local	4 – Low
1 – Site only	2 – Minor
0 – None	

Once these factors are ranked for each impact, the significance of the two aspects, occurrence and severity, is assessed using the following formula:

SP (significance points) = (probability + duration + scale) x magnitude

The maximum value is 150 significance points (SP). The impact significance will then be rated as follows:

SP >75	Indicates high environmental significance	An impact which could influence the decision about whether or not to proceed with the project regardless of any possible mitigation.
SP 30 – 75	Indicates moderate environmental significance	An impact or benefit which is sufficiently important to require management and which could have an influence on the decision unless it is mitigated.
SP <30	Indicates low environmental significance	Impacts with little real effect and which should not have an influence on or require modification of the project design.

16.8 ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Please refer to **Table 12** which indicates the quantification of impacts related to construction activities and **Table 13** which indicates the quantification of impacts related to the operational activities, as per the methodology identified above.

Also please refer to **Annexure P** for the Draft Environmental Management Plan (EMP).

Legend:	M:	Magnitude of impact	High	>70	SBM: Significance Before Mitigation
	D:	Duration of impact	Mod.	30 -70	SAM: Significance After Mitigation
	S:	Scale of impact	Low	0 - 30	
	P:	Probability of unmitigated occurrence occurring			

16.8.1 Construction Phase

Table 12: Quantification of impacts related to construction activities

Environmental Component	Activity	Potential Impact	Environmental Significance Score							Mitigation Measures	
			P	D	S	M	Total	Rating			
16.8.1.1 Physical Impacts											
Geology	Apart from some areas with problematic soil conditions, no adverse conditions prohibiting the construction of structures for residential, commercial and industrial development were observed over the bulk of the site. Should the recommended measures be implemented the site is considered economically and practically developable provided that the recommendations given for the individual zones are adhered to.	4 3	2 2	1 2	6 4	48 24	SBM SAM	M L	<ul style="list-style-type: none">Geological monitoring should commence during the Construction Phase by the Geotechnical engineerSite specific investigations must be conducted on all erven planned for major structures prior to design finalization and construction.Detailed geotechnical investigations must be conducted for all high-rise structures, i.e. structures exceeding conventional double-storey height and built of load bearing brickwork. It is recommended that boreholes for monitoring the ground water be installed in at least three places within the development. Ideally these should be located in the low lying area close to the river, possibly in one of the Zone D areas, in the high lying area to the west, possibly in the Zone C area and in the north.Certification of structures' foundations by a competent geotechnical professional is required once buildings are under construction before the NHBRC will issue completion certificates.All foundations should be inspected by a competent person to ensure that the desired founding medium has been attained and that recommendations made in the Geotechnical report have been adhered to.Careful stormwater management will be required across the site in order to remove stormwater in a speedy and efficient manner and to prevent any accumulation of surface water against or near buildings. Refer to the Stormwater Management Plan attached hereto under Annexure K.Unconsolidated solid and organic waste fill must be removed		

Environmental Component	Activity	Potential Impact	Environmental Significance Score							Mitigation Measures
			P	D	S	M	Total	Rating		
Topography	Construction activities including levelling of road and building surfaces	Erosion	4 3	2 2	2 1	6 4	48 24	SBM SAM	M L	<ul style="list-style-type: none"> Demolition and construction activities should preferably take place during the dry months All surface run-offs shall be managed in such a way so as to ensure erosion of soil does not occur All surfaces that are susceptible to erosion shall be covered with a suitable vegetative cover as soon as construction is completed Where erosion may potentially occur, dissipaters such as gravel beds or straw bales must be installed to prevent erosion. For further information please refer to the EMP (Annexure P)
Air quality	Construction activities and vehicles on site.	Dust pollution that affects adjacent developments.	3 2	2 2	2 1	6 4	42 20	SBM SAM	M L	<ul style="list-style-type: none"> Dust to be minimised by spraying down (water truck) of construction site daily
Soils and land capability	Site clearance for road construction and construction of units and other structures	Compaction of topsoil	4 2	2 2	1 1	6 4	42 20	SBM SAM	M L	<ul style="list-style-type: none"> The top (200-300mm) layer (as applicable) of all areas to be excavated for the purposes of construction shall be stripped and stockpiled in areas where this material will not be damaged, removed or compacted. This stockpiled material shall be used for the rehabilitation of the site. Weeds appearing on the stockpiled topsoil shall be removed by hand before seeding. For further information please refer to the EMP (Annexure P)
	Site vehicles and storage of fuel on site	Contamination by fuel and lubricant spillages from vehicles	3 2	2 2	1 1	5 4	30 20	SBM SAM	M L	<ul style="list-style-type: none"> Provision of proper re-fuelling and maintenance facilities and procedures will reduce the likelihood of soil contamination For further information please refer to the EMP (Annexure P)
Water quality and availability	Storage of fuel and re-fuelling of construction vehicles	Fuel or chemical spillage and pollution of surface and/or ground water	3 1	2 2	2 2	6 4	42 20	SBM SAM	M L	<ul style="list-style-type: none"> Good housekeeping by contractor Store new and used oils in bunded areas No co-handling of reactive liquids or solids should be allowed Create and monitor an inventory of chemicals held on site For further information please refer to the EMP (Annexure P)

Environmental Component	Activity	Potential Impact	Environmental Significance Score							Mitigation Measures
			P	D	S	M	Total	Rating		
	There will be no construction related impact on the quantity of groundwater available to surrounding borehole users									<ul style="list-style-type: none"> None, although groundwater monitoring should commence during the Construction Phase
16.8.1.2 Biophysical Impacts										
Flora	Site clearing for construction activities	Loss of species diversity and habitat characteristics, and impact on habitat for floral species Impact on floral species of conservational concern	5 4	2 2	1 1	10 8	80 56	SBM SAM	H M	<ul style="list-style-type: none"> Most of the site will be transformed due to the requirement to develop this site as a regional node The Environmental Control Officer (ECO) is to be trained to be able to identify any possible red data species Set up a planting list together with the ecologist from which all rehabilitation in the development must be done – only indigenous and non-invasive species The boundaries of the development footprint areas are to be clearly defined and it should be ensured that all activities remain within defined footprint areas. Avoid construction activities area to be zoned as open space and the wetland habitat unit, as well as the associated 32m buffer zone. Restrict vehicles to travelling only on designated roadways to limit the ecological footprint of the proposed development activities. All soils compacted as a result of construction activities falling outside of the development footprint areas should be ripped and profiled. Proliferation of alien and invasive species is expected within any disturbed areas. These species should be eradicated and controlled to prevent their spread beyond the development footprint areas. Alien plant seed dispersal within the top layers of the soil within footprint areas, has to be controlled. Care should be taken with the choice of herbicide to ensure that no additional impact and loss of indigenous plant species occurs due to the herbicide used Prohibit the collection of plant material for firewood or for

Environmental Component	Activity	Potential Impact	Environmental Significance Score							Mitigation Measures
			P	D	S	M	Total	Rating		
										<p>medicinal purposes.</p> <ul style="list-style-type: none"> For further information please refer to the EMP (Annexure P)
Fauna	Site clearing for construction activities	Loss of species diversity and habitat Characteristics especially relating to Giant African Bullfrogs	5 4	2 2	1 1	10 8	80 56	SBM SAM	H M	<ul style="list-style-type: none"> Most of the site will be transformed due to the requirement to develop this site as a regional node The wetlands and 32m buffers zones to be retained as part of the open space system The Environmental Control Officer (ECO) is to be trained to be able to identify any possible red data species Rehabilitate and naturalise areas beyond the development footprint, which have been affected by the construction activities, using indigenous grass species. During the operational phase an annual assessment should be undertaken to check that no disturbance is occurring to the river and that alien plant species are being adequately controlled in the area, especially in the more sensitive areas. Fence construction footprint areas to contain all activities within designated areas. Should any SCC or other common faunal species be found within the development footprint area, these species should be relocated to similar habitat within the vicinity of the study area with the assistance of a suitably qualified specialist. Adult bullfrogs should be prevented from returning to the areas being transformed and developed prior to commencement of construction, preferably at the start of the rainy season and temporary fences should be erected to prevent re-dispersal back

Environmental Component	Activity	Potential Impact	Environmental Significance Score							Mitigation Measures
			P	D	S	M	Total	Rating		
										<p>into areas of the property where construction / excavation is taking place. The frogs will be contained in the areas to be zoned as open space. Refer to the Environmental Management Plan (EMP) attached hereto for the proposed method.</p> <ul style="list-style-type: none"> Awareness campaigns and regulations must be implemented and maintained among residents so that the corridors and buffers can double as recreational parks and public open space. Such parkland must be used and maintained as conservation areas and grassland conditions should be kept as natural as possible with sandy areas for burrowing and habitat suitable for prey animals (insects, small rodents, etc.) to flourish. Fire management should be practiced to eliminate rank grass. Rhysomatic grasses such as Kikuyu and <i>Cynodo sp.</i> Should be avoided because they bind the soil and restrict burrowing. If trees are planted they must be widely spaced with large areas of open grassland in between. Road crossings should be regulated to prevent road kills during the short season of bullfrog surface activity. All contractor and sub-contractor staff must be trained to recognize and protect Giant African Bullfrogs. Culverts at least 500mm high and 500mm wide must be installed underneath roads crossing the biodiversity corridors to serve as migration tunnels for giant bullfrogs and other small faunal species. This must be completed in conjunction with an amphibian specialist and the Gauteng Department of Agriculture and Rural Development during the construction phase. For further information please refer to the EMP (Annexure P)
Sensitive landscapes	Construction activities – Wetlands and	Loss of valuable landscape and habitat,	4 2	3 3	1 1	8 4	64 24	SBM SAM	M L	<ul style="list-style-type: none"> The sensitive wetland areas including the 32m buffer areas adjacent and off the proposed development site are to be fenced off from all construction activities No activities should take place in the wetlands and associated

Environmental Component	Activity	Potential Impact	Environmental Significance Score							Mitigation Measures
			P	D	S	M	Total	Rating		
	32m buffer areas	changing the quantity and fluctuation properties of the watercourse by for example stormwater input, or restricting water flow, changing the amount of sediment entering water resource and associated change in turbidity (increasing or decreasing the amount), Alteration of water quality – increasing the amounts of nutrients (phosphate, nitrite, nitrate), Alteration of water quality – toxic contaminants (including toxic metal ions (e.g. copper, lead, zinc)								<div>buffer zone.</div> <ul style="list-style-type: none">Prevent pedestrian and vehicular access into the wetland and buffer areas.Formalise access roads and make use of existing roads and tracks where feasible, rather than creating new routes through naturally vegetated areas.Prevent stormwater or contaminated water directly entering the riparian areas.Alien plant eradication and follow-up control activities prior to construction, to prevent spread into disturbed soils, as well as follow-up control during construction.The amount of vegetation removed should be limited to the least amount possible.Rehabilitation of damage/impacts that arise as a result of construction must be implemented immediately upon completion of constructionWhere possible, maintenance within the riparian area must be restricted to the drier winter monthsWater is expected to seep into any area of trenching and earthworks. It is likely that water will be contaminated within these earthworks and should thus be cleaned or dissipated into a structure that allows for additional sediment input and slows down the velocity of the water thus reducing the risk of erosion. Structures such as boulder weirs should be considered for its ability to absorb excess sediment as well as dissipating the water over a larger area.Grassland can be removed as sods and stored within transformed vegetation. The sods must preferably be removed during the winter months and be replanted by latest springtime. The sods should not be stacked on top of each other or within sensitive environs. Once construction is completed, these sods should be used to rehabilitate the disturbed areas from where they have been removed. In the absence of timely rainfall, the sods should be watered well after planting and at least twice more over the next 2 weeks.

Environmental Component	Activity	Potential Impact	Environmental Significance Score							Mitigation Measures
			P	D	S	M	Total	Rating		
		and hydrocarbons, Changing the physical structure within a water resource (habitat)								<ul style="list-style-type: none"> Runoff from the construction area must be managed to avoid erosion and pollution problems. Provision of adequate sanitation facilities located outside of the riparian area or its associated buffer zone Implementation of appropriate stormwater management around the excavation to prevent the ingress of run-off into the excavation and to prevent contaminated runoff into the riparian area After construction, the land must be cleared of rubbish, surplus materials, and equipment, and all parts of the land shall be left in a condition as close as possible to that prior to use. For further information please refer to the EMP (Annexure P)
Conservation	Delineation of conservation area – the wetland areas and associated buffers	Conservation and maintenance of valuable landscape and habitat – benefit to local and regional biodiversity by minimising fragmentation of ecological systems	4 3	2 2	3 2	6 4	42 28	SBM SAM	M L	<ul style="list-style-type: none"> Delineation of the conservation area prior to commencement of construction activities Education of construction workers regarding the value of the conservation area
16.8.1.3 Socio-economic Impacts										
Noise pollution	All construction activities	Nuisance to surrounding land owners	4 3	3 3	2 1	6 4	54 28	SBM SAM	M L	<ul style="list-style-type: none"> Locate noisy machines and equipment maintenance areas as far away from sensitive receptors as possible Adherence to acceptable working hours Adherence to Occupational Health and Safety Act Ear protection for workers that may be affected by noise For further information please refer to the EMP (Annexure P)

Environmental Component	Activity	Potential Impact	Environmental Significance Score							Mitigation Measures
			P	D	S	M	Total	Rating		
Visual integrity	Construction activities	Visibility of dust and construction activities from surrounding roads, properties and tourist locations	3 2	3 3	2 2	6 4	48 28	SBM SAM	M L	<ul style="list-style-type: none"> Apply dust control measures diligently, especially on provincial roads Apply recommendations of specialist regarding colour and construction of site structures during the Construction Phase
Sites of cultural significance	<p>Except for the two Ndebele farm workers settlements no other important cultural heritage resources or graves have been found on the proposed development site. The two farm workers settlements are important and should be fully recorded in a Phase II cultural heritage resources impact assessment before an application can be made for demolishing permit.</p> <p>If during construction any cultural heritage resources or graves are unearthed all work has to be stopped until the site has been inspected and mitigated by a cultural heritage practitioner.</p>									<ul style="list-style-type: none"> Should any other potentially culturally significant artefacts or graves, etc be found during construction activities all activities should be stopped until an assessment by a Cultural Heritage practitioner has been completed For further information please refer to the EMP (Annexure P)

Environmental Component	Activity	Potential Impact	Environmental Significance Score							Mitigation Measures
			P	D	S	M	Total	Rating		
Safety and security	Construction workers in the area	Increase in crime in area and increase in squatters of vacant land	4 2	3 3	3 2	8 4	80 28	SBM SAM	H L	<ul style="list-style-type: none"> • Proper management and planning • No construction work will be allowed on Sundays • A limited number of workers along with security guards will be allowed to sleep on site, however within a cordoned-off secure area • All staff will carry identification, access control will be enforced and the site will be swept and a search will be done each night • The development will have 24-hour access control and security • A CLO (Community Liaison Officer) should be employed • For further information please refer to the EMP (Annexure P)
	Construction works	Migration of job seekers into the area in search of employment	3 2	3 3	2 2	6 4	48 28	SBM SAM	M L	<ul style="list-style-type: none"> • No on-site recruitment is to take place • The CLO (Community Liaison Officer) to be consulted regarding employment of members of the surrounding communities.
		Increase in construction traffic	4 3	3 3	3 2	8 4	80 32	SBM SAM	H M	<ul style="list-style-type: none"> • The access of large trucks will be investigated to provide a suitable access route that does not become a nuisance to existing residents • Only a specified number of trucks at any one time will be allowed onto the property • Construction vehicles and activities must aim to avoid peak hour traffic times (weekdays 7-8am and 5-6pm) • Establish an all-weather site access and wheel wash or shake down to prevent soil and materials from being trekked onto the road
		Decrease in safety due to increased traffic	4 3	3 3	2 2	10 6	90 48	SBM SAM	H M	<ul style="list-style-type: none"> • Security fencing and barriers • Perimeter fence patrols
Local services	Construction activities that utilise local services	Inadequate service provision to adjacent properties and malfunctioning of services	2 1	3 3	2 2	4 2	28 12	SBM SAM	L L	<ul style="list-style-type: none"> • The service systems are to be designed according to the minimum requirements of, and submitted to the Local authority for approval. • No construction activities must commence on site prior to obtaining the necessary approval

Environmental Component	Activity	Potential Impact	Environmental Significance Score							Mitigation Measures
			P	D	S	M	Total	Rating		
Fire	Cooking fires by construction workers	Veld fires	3 1	3 3	3 2	6 4	54 24	SBM SAM	M L	<ul style="list-style-type: none"> A designated area shall be assigned for fire making by the construction workers, so as to ensure that run-away veld fires do not occur This will reduce air pollution by excessive smoke
Improved tax base for local municipality	Employment of construction workers	Decrease in unemployment and crimes related to unemployment	4 5	3 3	2 2	8 8	72 80	SBM SAM	M H	<ul style="list-style-type: none"> Local labour to be used as far as possible for the installation of services and the construction of the retirement village and associated infrastructure Local training and capacity building programmes Construction timeframe could be lengthy due to the extent and phased nature of the proposed development
		BEE development opportunities	2 3	3 3	2 2	4 6	28 48	SBM SAM	L M	<ul style="list-style-type: none"> Contract requirements to involve and train BEE companies
	Local demand for goods and services	Decrease in unemployment and empowerment of local trade and industry	2 3	3 3	2 2	4 6	28 48	SBM SAM	L M	<ul style="list-style-type: none"> Local products, goods and services to be utilised as far as possible during the construction phase Local training and capacity building programmes

16.8.2 Operational Phase

Table 13: Quantification of impacts related to the operational phase

Environmental Component	Activity	Potential Impact	Environmental Significance Score							Mitigation Measures	
			P	D	S	M	Total	Rating			
16.8.2.1 Physical Impacts											
Geology	Apart from some small areas where development is not possible, no adverse conditions prohibiting the construction of structures for residential, commercial and industrial development were										<ul style="list-style-type: none">• Certification of structures' foundations by a competent geotechnical professional is required once buildings are under construction before the NHBRC will issue completion certificates.

Environmental Component	Activity	Potential Impact	Environmental Significance Score							Mitigation Measures
			P	D	S	M	Total	Rating		
	observed over the bulk of the site. From a geotechnical perspective, the site is considered economically and practically developable provided that the recommendations given for the individual zones are adhered to.									
Topography	Construction activities including levelling of road and building surfaces continued during operational phase	Erosion	4 3	2 2	2 1	6 4	48 24	SBM SAM	M L	<ul style="list-style-type: none"> Demolition and construction activities should preferably take place during the dry months. All surface run-offs shall be managed according to the stormwater management plan attached hereto under Annexure K so as to ensure erosion of soil does not occur. All surfaces that are susceptible to erosion shall be covered with a suitable indigenous vegetative cover as soon as construction is completed. Where erosion may potentially occur, dissipaters such as gravel beds or straw bales must be installed to prevent erosion. For further information please refer to the EMP (Annexure P)
Air quality	Vehicles on site continued during operational phase	Dust pollution that affects adjacent developments								<ul style="list-style-type: none"> Roads will be paved and dust will thus be eliminated
Soils and land capability	There are no expected operational related impacts on soils and land capability of the proposed development site and surrounding areas									<ul style="list-style-type: none"> Weeds appearing on the area must be maintained and eradicated For further information please refer to the EMP (Annexure P)
Water quality and availability	General usage of water (household, business, irrigation, etc)	Water wastage	4 2	4 1	3 2	6 4	66 20	SBM SAM	M L	<ul style="list-style-type: none"> Waste water to be recycled and re-used as far as possible to ensure that minimum amounts are required for aspects like irrigation. Good monitoring and management measurements to be set in place by facilities managers

Environmental Component	Activity	Potential Impact	Environmental Significance Score							Mitigation Measures
			P	D	S	M	Total	Rating		
	Malfunctioning of sewage treatment plant or any other serious pollution event	Water pollution	3 2	3 2	3 1	8 6	72 30	SBM SAM	H M	<ul style="list-style-type: none"> Adequate measures to be put in place to prevent surface and groundwater contamination of any kind – responsibility of civil engineers No French drains allowed All sewage infrastructure is to be maintained and checked at yearly intervals A plan should be put in place that caters for the event of a large fuel spill in the water – to form part of the recommendations of the RoD by GDARD
	There will be no operational activities that should impact on the quantity of groundwater available to surrounding borehole users									
16.8.2.2 Biophysical Impacts										
Flora	General human interference and impact	Loss of species diversity and habitat characteristics	4 2	4 1	1 1	6 4	54 16	SBM SAM	M L	<ul style="list-style-type: none"> Walkways throughout the open spaces and conservation zones will be strategically placed and users will be enforced to only use delineated walkway areas so as not to damage surrounding habitats Landscaping guidelines which include an allowable indigenous vegetation list that attracts fauna is to be formulated and made a condition of sale No exotic vegetation will be allowed
Fauna	General human interference and impact	Loss of species diversity and habitat Characteristics	4 2	4 1	1 1	6 4	54 16	SBM SAM	M L	<ul style="list-style-type: none"> Walkways throughout the open spaces (drainage line area) will be strategically placed and users will be enforced to only use delineated walkway areas so as not to damage surrounding habitats Landscaping guidelines which include an allowable indigenous vegetation list that attracts fauna is to be formulated and made a condition of sale No exotic vegetation will be allowed Buffers and corridors must be fenced with steel mesh of less than 25mm diameter to a height of at least 750mm and buried to a depth of 250mm. Cattle-proof posts and droppers would be required. Note: small mesh fencing must not cross the wetlands

Environmental Component	Activity	Potential Impact	Environmental Significance Score							Mitigation Measures
			P	D	S	M	Total	Rating		
										<p>as this would cause an accumulation of debris and obstruction after rain</p> <ul style="list-style-type: none"> Fences can be incorporated into security fences where suitable, provided that no electrified strands are installed below 500mm. Access can be provided through automatically closing gates mounted over a 250mm step. Fences across the width of the corridors must not obstruct hydrological flow and the free movement of Giant Bullfrogs. This requires a strand width of no less than 200mm, no base plinth or pedestal and no electrical strands below 500mm. Buffer and corridor fences must be maintained and checked to ensure that they are in good order in October of every year before the summer rains commence.
Sensitive landscapes	General human interference and impact	Loss of valuable landscape and habitat associated to drainage line to the west of the proposed development site	4 2	4 1	1 1	6 4	54 16	SBM SAM	M L	<ul style="list-style-type: none"> Walkways through sensitive landscapes will be strategically placed and users will be enforced to only use delineated walkway areas so as not to damage surrounding habitats
Conservation	Delineation of conservation corridor associated to with the wetlands situated on the site especially relating to the Glen Austin Pan	Rehabilitation, conservation and maintenance of this landscape and habitat – benefit to local and regional biodiversity by minimising fragmentation of ecological systems	2 4	1 4	2 5	4 8	20 88	SBM SAM	L H	<ul style="list-style-type: none"> Conservation management to be done in collaboration with the local municipality

Environmental Component	Activity	Potential Impact	Environmental Significance Score							Mitigation Measures	
			P	D	S	M	Total	Rating			
16.8.2.3 Socio-economic Impacts											
Noise pollution	As the site will be established and due to the activities related to the operational phase (residential) no major impacts are expected, however, due to the phased nature of the project construction activities will continue for a lengthy period										<ul style="list-style-type: none">Please refer to the noise mitigation measures during construction phase (Table 13), as well as the EMP (Annexure P)
Visual integrity	Higher density caused by development and change in land use	Change in sense of place of the specific site, however appropriate and good design will result in an improved urban character and will positively enhance the site and surrounding urban context potentially raising economic value of surrounding areas	4 3	4 4	2 2	8 4	80 36	SBM SAM	H M		<ul style="list-style-type: none">Architectural guidelines (including aspects of roof and wall finishes, colours, heights of buildings, and lighting), as well as Landscape Architectural guidelines (screening, buffering, functioning, aesthetics etc) for the development will be developed to promote the enhancement of this urban area and therefore creating new and valuable places with a modified and positive urban mixed-use sense of place that is vibrant and diverse
Sites of cultural significance	Except for the two Ndebele farm workers settlements no other important cultural heritage resources or graves have been found on the proposed development site. The two farm workers settlements are important and should be fully recorded in a Phase II cultural heritage resources										<ul style="list-style-type: none">A permit must be obtained prior to demolition of the Ndebele settelements.Should any other potentially culturally significant artefacts or graves, etc be found and an assessment by a Cultural Heritage practitioner has to be completed

Environmental Component	Activity	Potential Impact	Environmental Significance Score							Mitigation Measures
			P	D	S	M	Total	Rating		
	impact assessment before an application can be made for demolishing permit. If any cultural heritage resources or graves are unearthed all work has to be stopped until the site has been inspected and mitigated by a cultural heritage practitioner.									
Safety and security	Active operational phase with variety of functions and activities ranging from residential, business and commercial	Decrease in crime due to the creation of a more secure environment and minimising of vacant land	2 4	2 4	1 2	4 8	20 80	SBM SAM	L H	<ul style="list-style-type: none"> Security provided via passive surveillance Appropriate environmental design to address safety and security issues (CSIR publication) Good accessibility for emergency and police services
Traffic increase	Increase of residents and users of the area	Additional vehicles on road	4 3	4 3	3 2	8 4	88 24	SBM SAM	H L	<ul style="list-style-type: none"> All requirements of local municipality to be adhered to All improvements to road infrastructure as recommended by traffic engineer to be adhered to
Local services	Operational activities not to influence the availability of services to surrounding land owners									<ul style="list-style-type: none"> The engineers compiling the services report and designing services are to ensure that adequate measures are in place to ensure adequate service delivery that does not influence surrounding areas All requirements by local municipality to be adhered to regarding service reticulation and delivery
Fire	There are no expected operational related occurrences other than normal urban activities that may result in site fires.									<ul style="list-style-type: none"> Adequate positioning of fire hydrants according to Ekurhuleni Metropolitan Municipality's standards.

Environmental Component	Activity	Potential Impact	Environmental Significance Score							Mitigation Measures
			P	D	S	M	Total	Rating		
Improved tax base for local municipality	Employment of workers during the operational phase – business sector, landscaping and maintenance, cleaning, teachers etc.	Decrease in unemployment and crimes related to unemployment	4 5	2 4	2 3	4 8	32 96	SBM SAM	M H	<ul style="list-style-type: none"> Local labour and employees to be made use of as far as possible for all aspects of the operational phase Local training and capacity building programmes
		BEE development opportunities	2 3	2 4	2 2	4 6	24 54	SBM SAM	L M	<ul style="list-style-type: none"> BEE companies to be trained and involved in during the operational phase of the development – e.g. Management of retail facilities, maintenance, landscaping, etc.
	Local demand for goods and services	Decrease in unemployment and empowerment of local trade and industry	2 3	2 4	2 2	4 6	24 54	SBM SAM	L M	<ul style="list-style-type: none"> Local products, goods and services to be utilised as far as possible during the operational phase – shops, craft centre, etc. Local training and capacity building programmes
	Increase in service delivery and number of erven	Increase in taxes raised on property								<ul style="list-style-type: none"> None required
Bulk Contributions	Improvement of infrastructure	Increased service provision, minimisation of traffic congestion								<ul style="list-style-type: none"> Should we well planned and strategically implemented in coordination with the Ekurhuleni Metropolitan Municipality and GAUTRANS

17.0 CONCLUSIONS

The development proposal has no fatal flaws in terms of the institutional, bio-physical or socio-economic environments. In fact, it is believed that the proposed development compliments the required and desired balance to be achieved between socio-economic and ecological / environmental factors.

The key issue possible impact is the destruction of sensitive / significant environments. The 1:100 year flood line and wetland buffer areas are protected without development. The green zone of 36 ha is provided as offset to the development of approximately 12 ha of wetlands in x79

The key issue related to land use has been addressed and the preferred alternative is recommended due to the balance that is retained between ecological and socio-economic factors, which align to the Ekurhuleni Metropolitan Municipality's Regional Spatial Development Framework which mentions the proposed development as a future regional node.

Risks and potential impacts related to the construction and operational phases have been addressed within the quantification of impacts process. The Environmental Management Plan (EMP) should be strictly adhered to, therefore mitigating impacts as far as possible.

It is undeniable, that the proposed development has an optimal location within the urban realm adjacent to existing urban amenities, services and infrastructure and that it is a logical area for infill development, especially with regard to the environmental authorisations that have been obtained for all the areas surrounding the proposed development site. Should this site not be developed, it will remain as an isolated and unconnected land area that will be vulnerable to crime and potential illegal informal occupation.

18.0 RECOMMENDATIONS

It is recommended that the 'Mix use Development' option which has been identified as the preferred alternative is used. It is further recommended that this application be approved with the following conditions:

- All requirements from the Ekurhuleni Metropolitan Municipality be adhered to including:
- Engineering services report addressing provision of services.
- Conditions and recommendations by the Engineering Geologists be adhered to
- All other state departments' comments and input be adhered to, including but not limited to:
 - Department of Water and Sanitation
 - South African Heritage Resource Agency
- All mitigation measures as described in this report and specialist reports are adhered to by the developer (these measures will be made part of the Environmental Management Plan (EMP)).
- The conditions of the Record of Decision from the Gauteng Department of Agriculture and Rural Development (GDARD) be written into the Environmental Management Plan (EMP) and be implemented as such.

- The EMP, as attached to this document, and as amended after the Environmental Authorisation is received, should be made part of the contractual documents of contractors. The project manager must also account for the cost of this document's implementation before construction takes place.
- An Environmental Control Officer (ECO) should be appointed to audit the Environmental Management Plan on a bi-weekly basis during construction phase.
- A penalty system is set up for non-compliance to the Environmental Management Plan (EMP) to be severe enough to practically control construction and operational activities on site.
- The Environmental Management Plan (EMP) must be made issued to individual stand developers for implementation
- That the surrounding community be kept up date through the Town Planning Application process and during Construction Phase of the project.

Prepared by Jitske Botes

A handwritten signature in dark ink, appearing to read 'Theron', with a long horizontal flourish extending to the right.

Reviewed by Dr Gwen Theron
PrLArch 97082
December 2015

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