

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT REPORT

Lanseria X51

Portion 22 of the Farm Bultfontein 533 JQ and Portion 164 of the
Farm Nooitgedacht 534 JQ

September 2015

Gaut: 002/11-12/E0124



Part 1 of 2



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LIST OF ABBREVIATIONS

CfG: Council for Geoscience

C-Plan: Conservation Plan

DEA: Department of Environmental Affairs

DFA: Development Facilitation Act

EAP: Environmental Assessment Practitioner

ECA: Environmental Conservation Act

EIA: Environmental Impact Assessment

IEMA: Institute of Environmental Management and Assessment

EIAR: Environmental Impacts Assessment Report

DWS: Department of Water and Sanitation

EMP: Environmental Management Plan

GAPA: Gauteng Agricultural Potential Atlas

GDARD: Gauteng Department of Agriculture and Rural Development

GSDF: Gauteng Spatial Development Framework

I&AP: Interested and affected party

IDP : Integrated Development Plan

MSDF: Metropolitan Spatial Development Framework

NSBA: National Spatial Biodiversity Assessment

NEMA : National Environmental Management Act

SACLAP: The South African Council of the Landscape Architects Profession

SAHRA: South African Heritage Resources Agency

SR: Scoping Report

SDF: Spatial Development framework

TIA: Traffic Impact Assessment

WMA: Water Management Area

WWTP: Waste Water Treatment Plant

1. INTRODUCTION

1.1 Background

Extension 24 Commercial Leasing Co (Pty) Ltd is planning a proposed mixed township development to be known as **Lanseria Extension 51** on the Remaining Extent of Portion 22 of the Farm Bullfontein 533 JQ and Portion 164 of the Farm Nooitgedacht 534 JQ. (**Refer to Figure 1: Locality Map and Figure 2: Aerial Map**). **Bokamoso Landscape Architects and Environmental Consultants** were appointed by the applicant to compile an Environmental Impact Assessment (EIA) for the proposed developments and its associated listed activities. The size of the property is approximately **36,8305 ha** in extent.

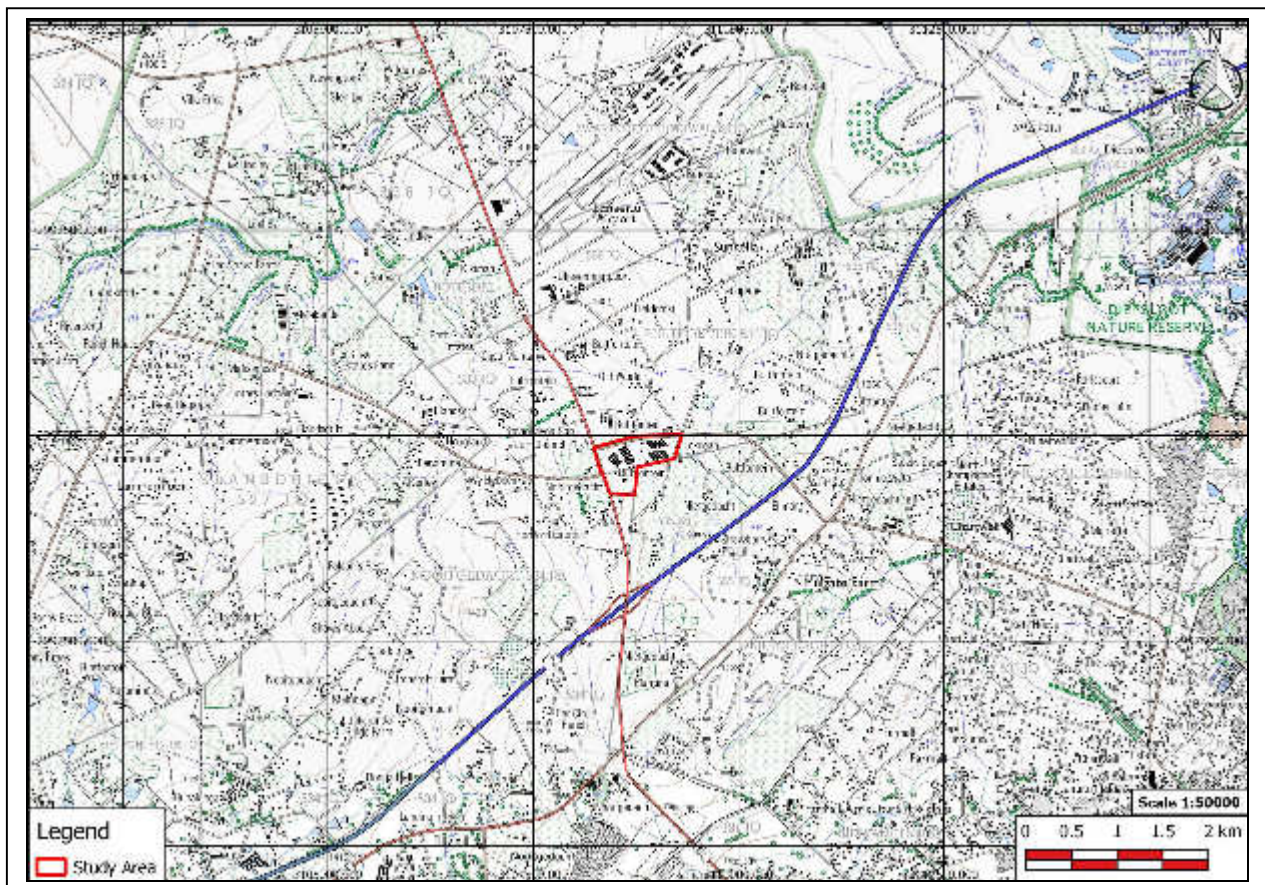


Figure 1: Locality Map

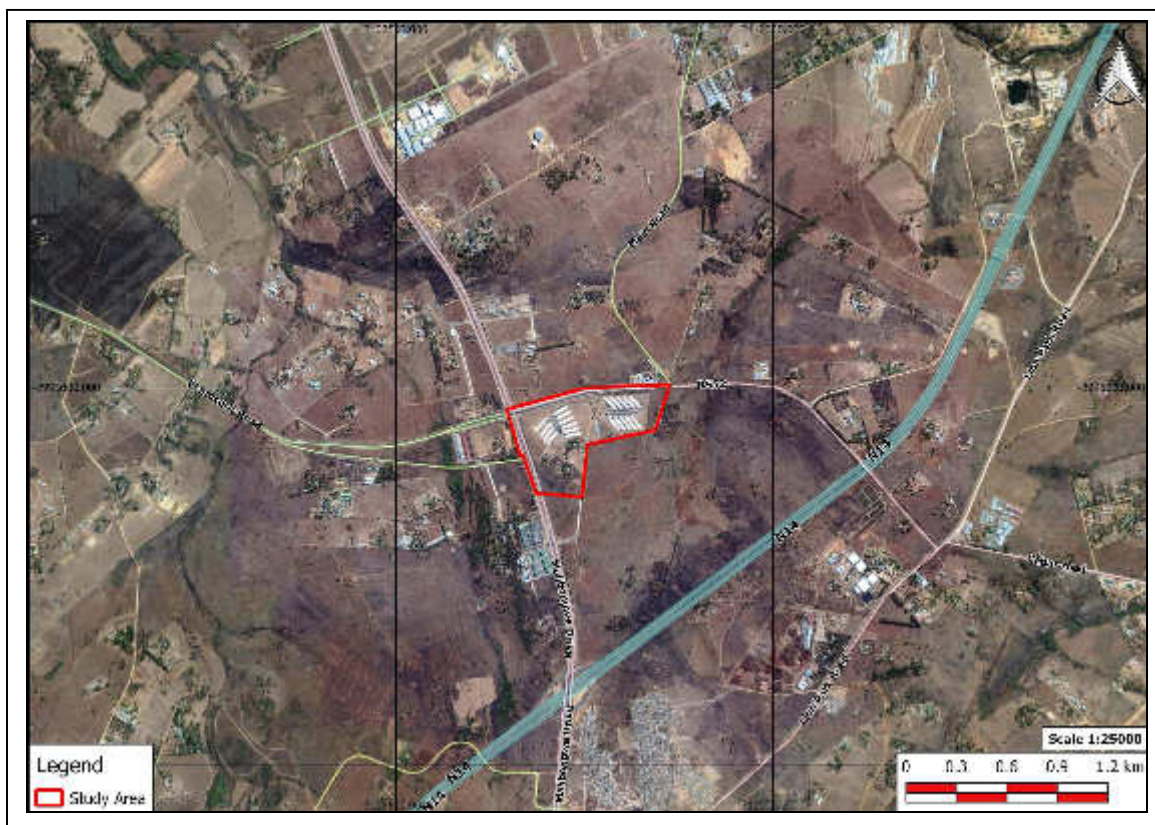


Figure 2: Aerial Map

Please Note: Enlarged copies of the figures are included as Annexure A

The application was made for the **establishment of a mixed use township** in terms of Section 96 (1) of the Town Planning and Township Ordinance, 1986 (Ordinance 15 of 1986), consisting of the following land-uses:

Erven 1 to 4: Use Zone: "Special", including Residential dwelling units, Hotels Wholesale/Retail, Warehouses, Workshops, Showrooms, Exhibition and Distribution Centers, Restaurants, Offices, Places of Amusement, Medical Consulting Rooms and Places of Instruction.

- Coverage: 60%
- Density: No Density Restrictions
- Floor Area Ratio: 4,8
- Parking: As per Scheme

Building lines: As per Scheme, 5m

In April 2006 the Minister of Environmental Affairs and Tourism passed environmental impact assessment regulations (the 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 Environmental Conservation Act, 1989 in 1997. The new regulations came into place on 3 July 2006. In June 2010 the Minister of Environmental Affairs (DEA) passed the Amended Environmental Impact Assessment Regulations in terms of Chapter 5 of the National Environmental Management Act, 1998 (NEMA). The Amended Regulations came into effect on 2 August 2010.

1.2 Environmental Assessment Practitioner (EAP) - (In Line with Section 32 (2) (a) (i) and (ii))

The Environmental Regulations require that relevant details of the Environmental Assessment Practitioner be included as part of the EIA Report. In this regard attached as **Annexure C**, is a copy of the CV of Lizelle Gregory from Bokamoso Landscape Architects and Environmental Consultants. In summary details of the EAP are indicated hereunder:

- **Name:** Lizelle Gregory
- **Company:** Bokamoso Landscape Architects and Environmental Consultants.
- **Qualifications:** Registered Landscape Architect and Environmental Consultant (degree obtained at the University of Pretoria) with 18 years' experience in the following fields:
 - Environmental Planning and Management;
 - Compilation of Environmental Impact Assessments;
 - Landscape Architecture; and

- Landscape Contracting

Ms. L. Gregory also lectured at the Technikon of South Africa and the University of Pretoria. She is also a Registered Member of the South African Council of the Landscape Architects Profession (SACLAP) (professional practise number: 97078), The International Association of Impact Assessments (IAIA); The Institute for Landscape Architects South Africa (ILASA); and the Institute of Environmental Management and Assessment (IEMAS).

1.3 Activities Applied For In Terms of NEMA - (In Line with Section 32 (2) (b) & (c))

The application for environmental authorization for the proposed mixed use development, situated on the Remaining Extent of Portion 22 of Farm Bullfontein 533 JQ and Portion 164 of the Farm Nooitgedacht 534 JQ, was submitted on 22 August 2011. The application is submitted in terms of the New NEMA Regulation, promulgated on 2 August 2010.

Please take note that on 4 December 2014 the New Environmental Impact Assessment Regulations was published under Government Notice R.982 and came into effect on the 8th of December 2014. According to Chapter 8, Transitional Arrangements and Commencement, and Regulation 52, Continuation of actions undertaken and Authorizations issued under previous NEMA regulations it is stated:

“52. (1) Any actions Undertaken in terms of the previous NEMA regulations and which can be undertaken in Terms of a provision of these Regulations must be regarded as having been undertaken in terms of provision of these Regulations. (2) Any authorisation issued in terms of the previous NEMA Regulations must be regarded to be an environmental authorisation issued In terms of these Regulations”

and Regulation 53, Pending Applications and appeals (NEMA), states:

“53. (1) An application submitted in terms of the previous NEMA regulations and which is Pending when these Regulations take effect, must despite the repeal of those Regulations be dispensed with in terms of those previous NEMA regulations as if those previous NEMA regulations were not repealed” as well

as “(3) Where an application submitted in terms of the previous NEMA regulations, is pending in relation to an activity of which a component of the same activity was not identified under the previous NEMA notices, but is now identified in terms of section 24(2) of the Act, the competent authority must dispense of such application in terms of the previous NEMA regulations and may authorise the activity identified in terms of section 24(2) as if it was applied for, on condition that all impacts of the newly identified activity and requirements of these Regulations have also been considered and adequately assessed.”

Therefore from the above it is clear that since this application was submitted in terms of the Amended 2010 NEMA EIA Regulations and are still pending the consideration of the Environmental Authorization will be made in terms of the 2010 Regulations. The new EIA Regulations, 2014 was taken in to consideration and all relevant listed activities as listed in Table 4 below was taken in to account.

The information contained in some specialist reports that were compiled during the scoping process, were used to identify the issues and additional specialist studies required to address/mitigate issues during the EIA phase.

Activities Applied for in Terms of NEMA 2010

In terms of Government Notices no. R544, no. R545 and no. R546 published in the Government Gazette no. 33306 of 02 August 2010 of the National Environment Management Act, 1998 (Act No. 107 of 1998) an Environmental Impact Assessment Process is required for the above-mentioned project, due to the fact that the following listed activities will be triggered / could be triggered:

Table 1: Listed activities in terms of Notice No R544

| | | |
|------------------------------------|------------|---|
| Listing No. 1 R. 544, 18 June 2010 | Activity 9 | The construction of facilities or infrastructure exceeding 1000 metres in length for the bulk transportation of water, sewage or storm water – <ul style="list-style-type: none"> (i) With an internal diameter of 0,36 metres or more; or (ii) With a peak throughput of 120 litres per second or more, excluding where: <ul style="list-style-type: none"> a. such facilities or infrastructure are for bulk transportation of water, sewage or storm water or storm water drainage inside a road reserve; or b. where such construction will occur within urban areas but further than 32 metres from a watercourse, measured from the edge of the watercourse. |
|------------------------------------|------------|---|

Table 2: Listed in activities in terms of Notice No R545

| | | |
|------------------------------------|-------------|--|
| Listing No. 2 R. 545, 18 June 2010 | Activity 15 | 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; Except where such physical alteration takes place for: <ul style="list-style-type: none"> (i) Linear development activities; or (ii) Agriculture or afforestation where activity 16 in this Schedule will apply |
|------------------------------------|-------------|--|

Activities considered in Terms of NEMA 2014

In terms of Government Notices no. R983, no. R984 and no. R985 published in the Government Gazette no. 38282 of 04 December 2014 of the National Environment Management Act, 1998 (Act No. 107 of 1998) the following listed activities will be triggered / could be triggered:

Table 3: Listed activities in terms of Notice No. R 983

| | | |
|--|--------------------|--|
| <p>Listing No. 1 R. 983, December 2014</p> | <p>Activity 9</p> | <p>The construction of facilities or infrastructure exceeding 1000 metres in length for the bulk transportation of water, sewage or storm water –</p> <ul style="list-style-type: none"> (iii) With an internal diameter of 0,36 metres or more; or (iv) With a peak throughput of 120 litres per second or more, <p>excluding where:</p> <ul style="list-style-type: none"> c. such facilities or infrastructure are for bulk transportation of water, sewage or storm water or storm water drainage inside a road reserve; or d. where such construction will occur within urban areas but further than 32 metres from a watercourse, measured from the edge of the watercourse. |
| <p>Listing No. 1 R. 983, December 2014</p> | <p>Activity 10</p> | <p>The development and related operation of infrastructure exceeding 1000 metres in length for the bulk transportation of sewage, effluent, process water, waste water, return water, industrial discharge or slimes</p> <ul style="list-style-type: none"> (i) with an internal diameter of 0,36 metres or more; or (v) with a peak throughput of 120 litres per second or more; <p>excluding where:</p> <ul style="list-style-type: none"> a. such facilities is for bulk transportation of sewage, effluent, process water, waste water, return water, industrial discharge or slimes inside a road reserve; or b. where such development will occur within an urban area. |
| | <p>Activity 27</p> | <p>The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for-</p> <ul style="list-style-type: none"> (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan |

Table 4: Listed activities in terms of Notice No. R 984

| | | |
|--------------------------------------|-------------|--|
| Listing No. 2 R,984 December 2014 | Activity 15 | The clearance of an area of 20 hectares or more of indigenous vegetation is required for- (iii) Linear development activities; or (iv) Maintenance proposes undertaken in accordance with a maintenance management plan. |
|--------------------------------------|-------------|--|

Extension 24 Commercial Leasing Co (Pty) Ltd, the legal owner appointed **Bokamoso Landscape Architects and Environmental Consultants CC**, to compile an Environmental Scoping Report and Environmental Impact Assessment (EIA) for the proposed development and its associated listed activities. This EIA has been prepared to comply with Section 32 of the National Environmental Management Act (NEMA), 1998 (Act 107 of 1998).

Since the proposed development includes listed activities from No. R544 and No. R545 an application for a full EIA process was lodged at the Gauteng Department of Agriculture and Rural Development (GDARD). The reference number **Gaut: 002/11-12/E0124** had been assigned to the application.

The proposed development is more than 20ha and therefore the Scoping and EIA process will be followed.

1.4 The Town Planning Process

The Town Planning Application was made in terms of Section 96 (1) of the Town Planning and Townships Ordinance, 1986 (Ordinance 15 of 1986) for the establishment of the proposed township situated on the Remaining Extent of Portion 22 of Farm Bullfontein 533 JQ and Portion 164 of the Farm Nooitgedacht 534 JQ.

1.5 Scope of Work and Approach to the Study

An application form for environmental authorisation of the relevant activities as well as an Environmental Scoping Report has been submitted to the Gauteng Department of

Agricultural and Rural Development (GDARD). The Scoping Report and the Plan of Study for EIA, which was submitted to GDARD on 29 October 2014 and accepted by the department on the 26 January 2015. **(Refer to Annexure D).**

An investigative approach was followed and the relevant physical, social, economic and institutional environmental aspects were assessed. The scope of work includes the necessary investigations, to assess the suitability of the study area and the surrounding environment for the proposed activities. The scoping exercise identified the anticipated environmental aspects in an issues matrix and it also supplied a preliminary significance rating for the impacts identified. The scoping process also assessed the possible impacts of the proposed development on the surrounding environment (including the interested and affected parties).

This document represents the EIA for the proposed development. The EIA must be in line with Section 32 of the National Environmental Management Act (NEMA), 1998 (Act 107 of 1998) and the Plan of Study for EIA that was submitted as part of the Scoping Report.

The EIA takes into consideration 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. A description of the property on which the activity is to be undertaken and the location of the activity on the property are described. A description of the proposed activity and any feasible and reasonable alternatives were identified. In addition, a description of the need and desirability of the proposed activity, including advantages and disadvantages that the proposed activity or alternatives may have, on the environment and community that may be affected by the activity are included.

An identification of all legislation and guidelines that we are currently aware of is considered in the preparation of this EIA Report. Furthermore a description of environmental issues and potential impacts, including cumulative impacts, are identified and discussed. Information on the methodology that will be adopted in assessing the potential impacts is furthermore identified, including any specialist studies or specialised

processes that were/ should be undertaken. The EIA Report eventually determines whether a proposed project should receive the “go-ahead” or whether the “no-go” option should be followed. If the EAP recommends that the project receive the “go-ahead”, it will (in most cases) be possible to mitigate the issues identified to more acceptable levels. Reference is also made to the mitigation of identified impacts or for further studies that may be necessary to facilitate the design and construction of an environmentally acceptable facility.

Details of the Public Participation Process (in terms of Sub-Regulation 1) are also included. Sub-Regulation 1 requires that the following information be included as part of the Public Participation Section of the EIA report:

- (i) The steps undertaken in accordance with the Plan of Study for EIA,
- (ii) A list of persons, organisations and organs that were registered as interested and affected parties;
- (iii) A summary of comments received from, and a summary of issues raised by the interested and affected parties, the date of receipt of these comments and the response of the EAP to those comments;
- (iv) Copies of any representations, objections and comments received from the registered interested and affected parties.

The mitigation measures and guidelines that are listed in the EIA Report are also summarised in a user-friendly document named an Environmental Management Plan (EMP). A Draft EMP is also a requirement of the EIA Process (Section 32 and 34 of the National Environmental Management Act (NEMA), 1998 (Act 107 of 1998)).

2. REGISTERED OWNERS AND TITLE DEED

The farm portions on which the proposed township is situated are registered in the name of **Extension 24 Commercial Leasing Co (Pty) Ltd.**

Table 5: Registered Owners and Title Deeds

| Farm Description | Registered Owner |
|--|---|
| The Remaining Extent of Portion 22 of the Farm Bullfontein 533 JQ. | Extension 24 Commercial Leasing Co (Pty) Ltd No T26274/2011 |
| Portion 164 of the Farm Nooitgedacht 534 JQ. | Extension 24 Commercial Leasing Co (Pty) Ltd NoT26274/2011 |

3. LOCALITY OF THE PROPOSED DEVELOPMENT – (In line with Section 32 (c))

The study area (**Remaining Extent of Portion 22 of the Farm Bullfontein 533 JQ and Portion 164 of the Farm Nooitgedacht 534 JQ**) is situated on the south eastern corner of the intersection between the K29 (R512) and K33 Provincial Road, between Lanseria Airport and the N14 Highway. **Refer to Figure 1, Locality Map.**

4. EXISTING ZONING AND LAND USE AND THE PROPOSED LAND-USE

4.1 Existing Zoning and Land Use

The site is currently zoned “Undetermined”, in terms of the Peri-Urban Areas Town Planning Scheme, 1975. Other properties in the vicinity are generally zoned “Undetermined”, “Special”, “Private Open Space” and “Industrial 1”.

4.2 Proposed Zoning and Land Use – (In line with Section 32 (b))

It is proposed that Erven 1 to 4 shall be subject to the following zoning and development controls:

Erven 1 to 4: Use Zone: “Special”, including Residential dwelling units, Hotels Wholesale/Retail, Warehouses, Workshops, Showrooms, Exhibition and Distribution Centers,

Restaurants, Offices, Places of Amusement, Medical Consulting Rooms and Places of Instruction.

| | |
|-------------------|-------------------------|
| Coverage: | 60% |
| Density: | No Density Restrictions |
| Floor Area Ratio: | 4,8 |
| Parking: | As per Scheme |
| Building lines: | As per Scheme, 5m |

5. ALTERNATIVES IDENTIFIED – (In line with Section 32 (f) and (h))

5.1 The “No-Go” Alternative

The developer purchased the property for development purposes and did not consider the “No-Go” alternative due to the following:

- The site, being large tract of vacant land on a highly visible and easily accessible route, within the precinct, offers a unique development opportunity for additional mixed use developments within the precinct;
- The study area is located in a very prominent location within the Lanseria Airport;
- The site is directly adjacent to the K29 Provincial Road (R512) thus having excellent visibility and easy access via subsidiary roads;
- The prominence of the property and the exposure thereof to the K29 Provincial Road (R512) and K33 Provincial Roads;
- South-west of the site is the Hertford Junction Shopping centre, the Megazone Business Park, Petrol Filling Station, Hertford hotel and wedding venue;
- The site is earmarked for future nodal uses in terms of the RSDf and Lanseria Development Framework 2020; and
- The greatest extent of the study area is located within the Gauteng Provincial Urban Edge, 2010 (**Refer to Figure 3**).

The “No-Go” Option means that the study area is left in its present condition. At present the study area is used as a chicken farm.

A low density chicken farm is not considered as an optimal use for regionally strategically located site. As development around the site increase, runoff water, smell and noise from the chicken farm could become problematic in the built environment.

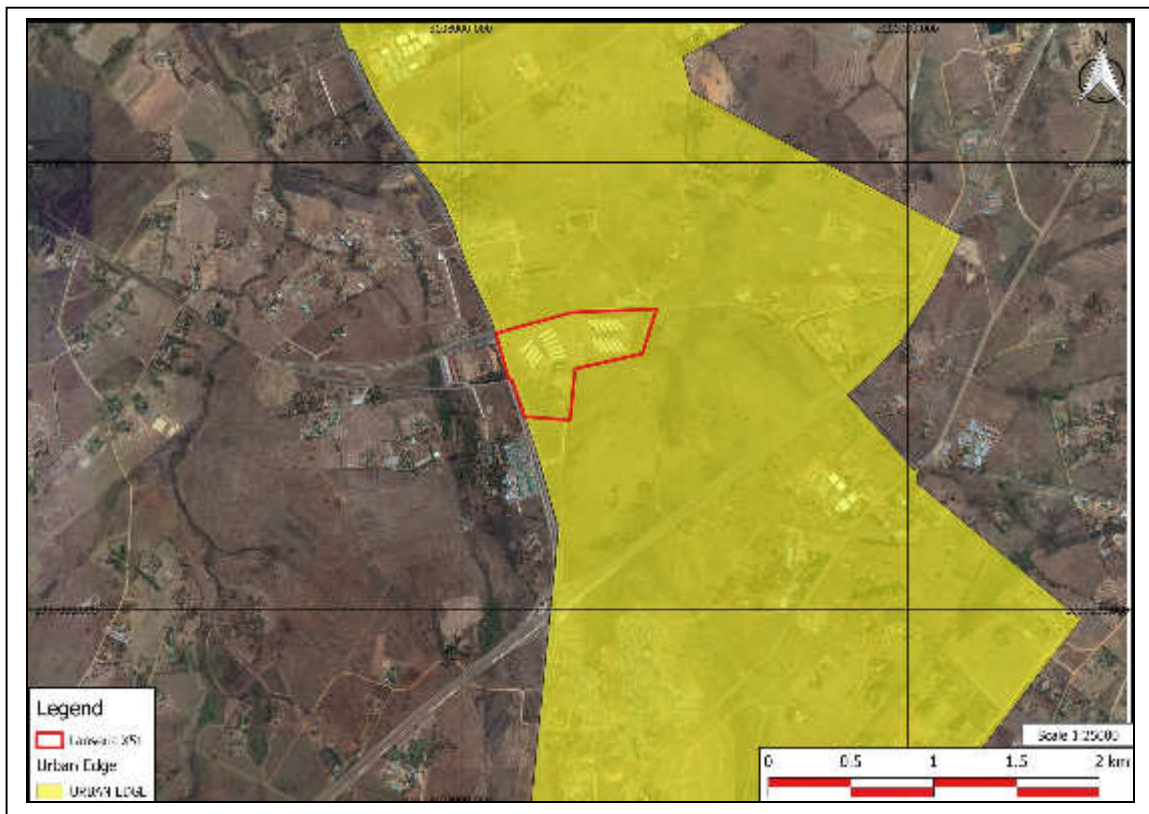


FIGURE 3 – Gauteng Urban Edge

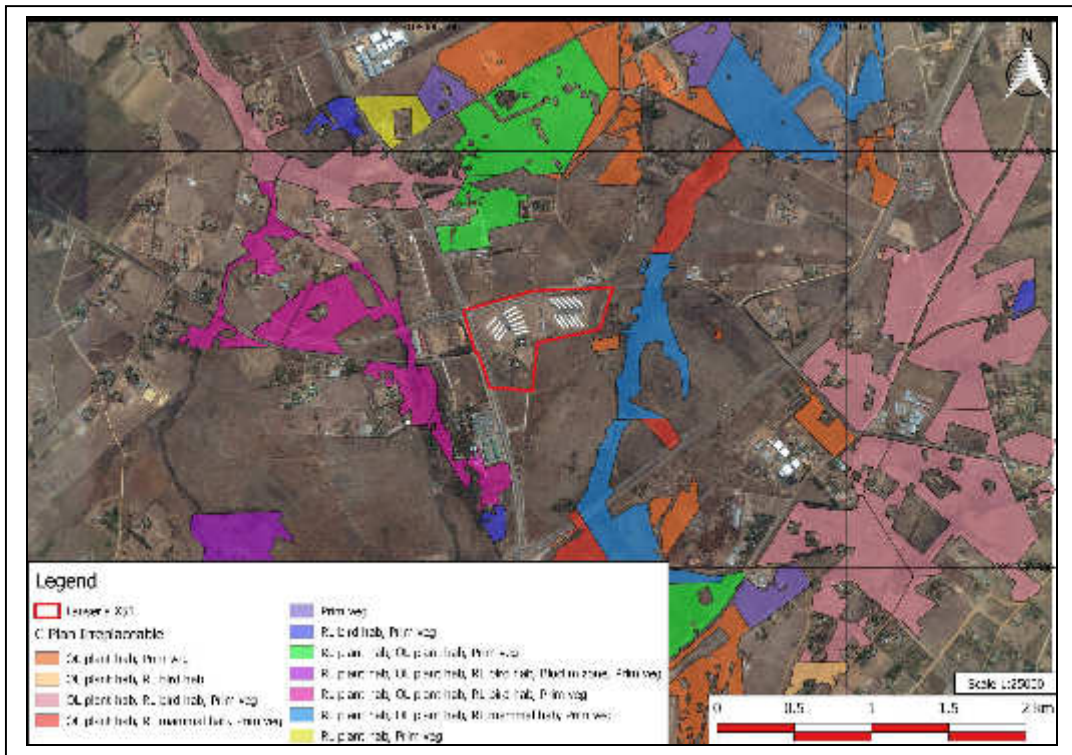


FIGURE 4: GDARD C-PLAN 3 IRREPLACEABLE SITES

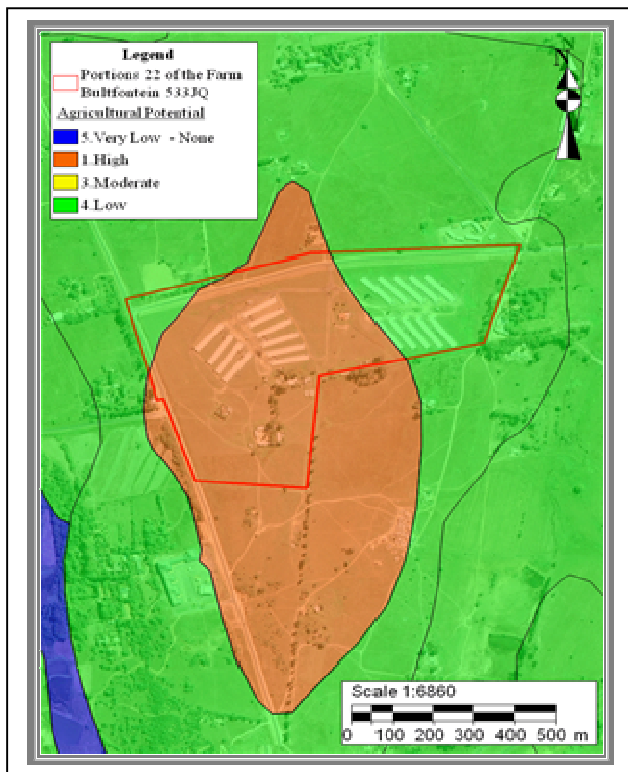


FIGURE 5: Agricultural Potential

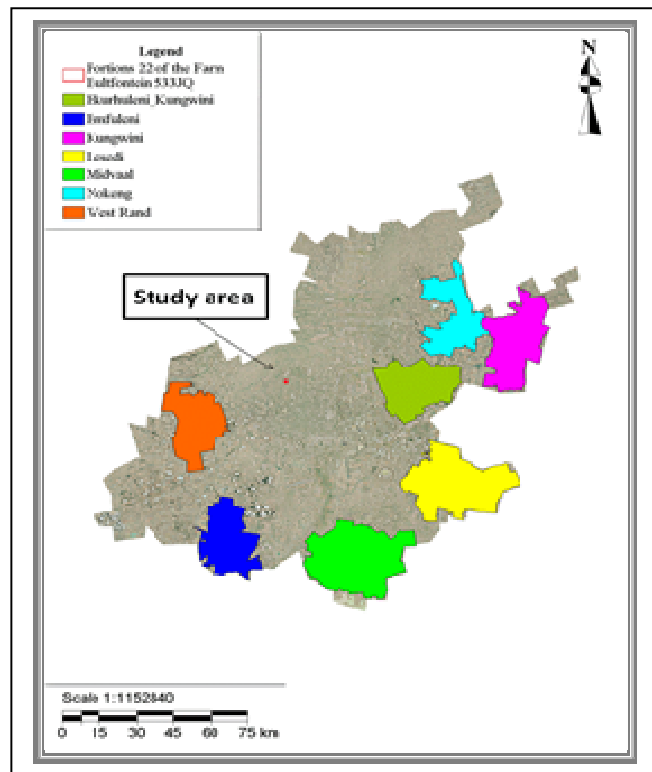

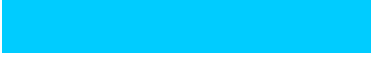









FIGURE 6: Agricultural hubs

To follow now are tables that represent a preliminary comparison between the “No-Go” alternative and the development alternative.

Diagram 1: Environmental Issues - “No-Go” Option

| Issue | Short term | Medium term | Long Term | |
|--|---|-------------|--|---------------------------------|
| Geology and soils |  | | | Positive Neutral Negative |
| The “no-go” option means that the chicken farm will continue to operate on the farm. There are currently minimum to no impact on the geology and soils as the chicken structures are already in place and in operation. No other buildings or alterations are expected on the site and therefore it is safe to say that the impact on the geology and soils will remain neutral during the short to long term. | | | | |
| Hydrology |  | |  | Positive Neutral Negative |
| The hydrology is neutral in the short term but is expected to turn negative in the medium to long term due to contamination of surface and groundwater from the activities of the chicken farm. Pollution in the form of manure and fertilizers dissolves by irrigation and rainwater which causes leaching into the groundwater and or run off into the surface water which causes water quality degradation. | | | | |
| Vegetation |  | |  | Positive Neutral Negative |
| The vegetation on the site is well currently well maintained and will continue to be maintained in the future. Therefore the impact of the current activities (chicken farm) is expected and seen as neutral throughout the short, medium and long term. | | | | |
| Fauna |  | |  | Positive Neutral Negative |
| The fauna is expected to remain neutral throughout all stages as no disturbances or activities other than the current uses are expected in the long term. Therefore the fauna currently residing or visiting the site is expected to still remain in the long term of the project. | | | | |
| Social |  | |  | Positive Neutral Negative |

The social impact is expected to turn negative in the medium to long term due to certain factors i.e. safety and security, noise, smell pollution etc. Safety and security risks are playing a major role and the fact that illegal vagrants could inhabit the farm should not be cancelled out. This could cause a severe safety problem to adjacent properties. Currently the adjacent sites are mainly vacant however developers are in the process of obtaining the relevant rights in terms of environmental authorization and in terms of the relevant town planning scheme. The chicken farm furthermore will have negative impacts on the adjacent areas in terms of smell and noise pollution. Should future development take place on the adjacent properties the smell pollution from the chicken farm will have a severe negative impact on humans residing and or working in the area.

| | |
|----------|----------|
| Economic | Positive |
| | Neutral |
| | Negative |

Over the long to medium term it is expected that the economic value will decrease from neutral and become negative due to this area being earmarked for future development. The study area is situated in close proximity to the Lanseria Airport. This area is considered and characterised as a rapid growing area which amongst other has been identified as an area where a large percentage of all new developments is being created for the Greater Johannesburg Metropolitan area. The areas of land in the Lanseria area is much sought after for development due to its high level of accessibility, proximity to work opportunities and locational desirability. The proposed development on this portion of land is supported by the Lanseria Development Framework 2020 and the RSDF (Regional Spatial Development Framework).

When weighing the agricultural chicken farm up against the future mixed use development it should be mentioned that the chicken farm on its own are too small to be economically viable in the long term and the study area is far too small for alternative farming activities in example crop farming. There will furthermore be no connectivity with agricultural land adjacent to the property as developers are already in the process of obtaining their environmental and town planning rights for future developments. This chicken farm on the other hand could continue successfully on any other portion of land used for agricultural activities.

| | |
|--------------|----------|
| Agricultural | Positive |
| | Neutral |
| | Negative |

The agricultural land will remain neutral throughout all stages as this land is zoned for agricultural purposes and therefore it cannot be argued that this property is better suited for any other use other than agriculture. However weighing up all the other factors (social, economic, infrastructure etc.) against each other it can be mitigated that when considering the economic factor and future uses of land in the area that continuing with agricultural uses could be a great loss for this portion of land. In the light of the above it would then not be as feasible and viable when only considering agricultural land on its own.

| | |
|----------------|----------|
| Infrastructure | Positive |
| | Neutral |
| | Negative |

The infrastructure is seen to decrease from neutral in the short term to negative in the long term. Should development not take place in this area no services will be installed and brought to this area. With future development, developers will need to ensure that sufficient services are in place at their own cost in order for developments to be carried out successfully. When considering the future development planning strategies of the area it is essential that the services be upgraded and installed in this area as it is characterised as a future growth node.

Note: The “no-go” option is predominantly neutral in the short and medium term, and turns negative in the long term

Diagram 2: Environmental Issues of the proposed development

| Issue | Short term | Medium term | Long Term | |
|---|------------|-------------|-----------|----------|
| Geology and soils | | | | Positive |
| | | | | Neutral |
| | | | | Negative |
| <p>Geology and soil is expected to be negative in the short term due to construction activities on site. Construction activities pose a negative impact on the geology and soil due to movement on site, excavation and normal construction related activities which causes soil erosion; loss of soil that will be deposited somewhere else which could also pose a water quality issue directly as a result of siltation and indirectly from contaminants carried with or attached to the soil particles. However the duration of the impact is short lived and only as part of the construction phase. From there onwards the impact turns neutral and remains neutral in the long term.</p> | | | | |
| Hydrology | | | | Positive |
| | | | | Neutral |
| | | | | Negative |
| <p>The hydrology is expected to be negative in the short term, neutral in the medium term and positive in the long term.</p> <p>During the construction phase it is expected that changes in surface hydrology will alter the flow of water through the landscape. Development activities as well as spill over effects of development such as increased demand for drinking water and increased auto use can impact water quality by contributing sediment, nutrients and other pollutants to limit water supplies, and increase the rate and volume of water.</p> <p>During the medium to long term engineering structures will be in place and the impact will be neutral to positive. Groundwater, service water and storm water will all be mitigated and in place during the operation phase which is seen as the medium to long term of the project.</p> | | | | |
| Vegetation | | | | Positive |
| | | | | Neutral |
| | | | | Negative |
| <p>The vegetation will be negative in the short to medium turn as construction activities will have a negative impact on the vegetation and most of the vegetation will be removed and cleared. After construction it is expected that it will improve to neutral as vegetation will be re-planted and landscaped and will be maintained during the operation phase of the mixed use activities.</p> | | | | |
| Fauna | | | | Positive |
| | | | | Neutral |
| | | | | Negative |
| <p>The Fauna is expected to be negative in the short term due to construction activities on site. After the construction phase it will remain neutral as no further disturbances will occur on the site and the area will be landscaped with connectivity strips to adjacent properties (if possible) for the fauna.</p> | | | | |
| Social | | | | Positive |
| | | | | Neutral |

| | |
|--|---------------------------------|
| | Negative |
| <p>During the construction phase the social factor will be negative in the short term. A lot of workers are on the site which leads to safety and security issues to adjacent properties. In the medium to long term it will have a neutral to positive impact as numerous job opportunities will be created on a temporary to permanent basis. The area will be secured and safe with no unwanted vagrants inhabiting the site. The mixed use development will be aesthetically pleasing to the surrounding area and the retail sector will attract a lot of tourists that are passing by on their way to the Lanseria Airport due to the ideal location of the site.</p> | |
| Economic | Positive Neutral Negative |
| <p>A positive impact is expected from the short to the long term of the project. This area is earmarked for future development and supported by the RSDP and the Lanseria Development Framework 2020. This site is ideally situated in terms of its locality and accessibility and Lanseria Airport is furthermore in close proximity to the site. Developers are sought to invest in properties in the Lanseria area as it has future potential growth.</p> | |
| Agricultural | Positive Neutral Negative |
| <p>The agricultural factor will remain negative as this portion of land is zoned for agricultural activities. Anything other than agriculture is seen as negative. However when taking the other factors i.e. economic, social, infrastructure etc. into consideration it outweighs the negative factor of development on agricultural land.</p> | |
| Infrastructure | Positive Neutral Negative |
| <p>Development in any area brings forth services and infrastructure. Therefore in the short term the impact is to be negative as the services needs to be installed but this is only for a short duration. Thereafter the negative impact turns into a neutral to positive impact as the area will be fully serviced and most likely at the cost to the developer. Therefore it immediately creates a positive impact for the community and its surroundings.</p> | |

Note: From the investigations that were done, it is anticipated that the proposed development option is predominantly negative in the short term, turns neutral in the medium term and then positive in the long term.

5.2 Land-Use Alternatives

5.2.1 Alternative 1: 'Residential Only' development

The "Residential Only" alternative means that the study area will be developed with residential dwelling units without provision for: Hotels, Wholesale/Retail, Warehouses, Workshops, Showrooms, Exhibition and Distribution Centers, Restaurants, Offices, Places of Amusement, Medical Consulting Rooms and Places of Instruction, as

included in the mixed use option. Although the establishment of a Residential component is considered as an alternative for the site, a need arise for efficient services and job opportunities closer to the living area. The “residential only” alternative will be investigated further in the EIA phase.

5.2.2 Alternative 2: Mixed use development (Preferred alternative)

In terms of this application it is the intention of the applicant to establish a township on the site but to include other land uses to provide in the full township on the site but to include other land uses to provide in the full spectrum of land uses that can be developed in this advantages location. It is proposed that there will be four erven in the Township. The Township will include residential dwelling units, hotels, wholesale/retail, warehouse, workshops, showrooms, exhibition and distribution centers, restaurants, offices, place of amusement, medical consulting rooms and places of instruction.

A mixed use development was regarded as the preferred alternative for the study area based on its close proximity to the upgraded international airport at Lanseria. The site is extremely well suited for mixed use developments due to its excellent, visibility and location within this precinct. A mixed use development will provide employment opportunities in close proximity to residential areas which increase urban efficiencies while contributing to the economy.

5.3 Locality Alternatives

The locality of the study area is desirable for the proposed development due to the following:

- The site, being large tract of vacant land on a highly visible and easily accessible route, within the precinct, offers a unique development opportunity for additional mixed use developments within the precinct.
- The study area is located in a very prominent location within the Lanseria Airport.

- The site is directly adjacent to the K29 Provincial Road (R512) thus having excellent visibility and easy access via subsidiary roads.
- The prominence of the property and the exposure thereof to the K29 Provincial Road (R512) and K33 Provincial Roads.
- South-west of the site is the Hertford Junction Shopping Centre, the Megazone Business Park, Petrol Filling Station, Hertford hotel and wedding venue.
- The site is earmarked for future nodal uses in terms of the RSDF and Lanseria Development Framework 2020.
- The site is owned by the developer. Therefore no other site was considered.

5.4 Layout alternatives

Many alternative layouts for the development will be considered during the EIA phase of the development before the layout will be finalized.

The physical features of the study area and the alignment of the Existing K29 & K33 are considered as the main structuring elements for the layout. The final layout will correlate with an environmental sensitivity map which will be compiled for the study area. **(Refer to Figure 13 for Preliminary Environmental Sensitive Issues Map).**

The final layout will be a product of a multi-disciplinary workshop (during the EIA phase) between the appointed professionals. Professionals will be afforded the opportunity to share their findings with the other members of the project team. The environmental consultants will present the environmental sensitivity map to the project team during these workshops.

The following disciplines will take part in the workshop:

- The civil engineers;
- The electrical engineers,
- The geotechnical engineers;
- Town and Regional Planners;

- The Urban Designers;
- The Architects and Landscape Architects;
- The Environmental Consultants (Bokamoso); and
- The Applicant.

The comments and issues raised by the interested and affected parties will be taken into consideration during the layout of the development.

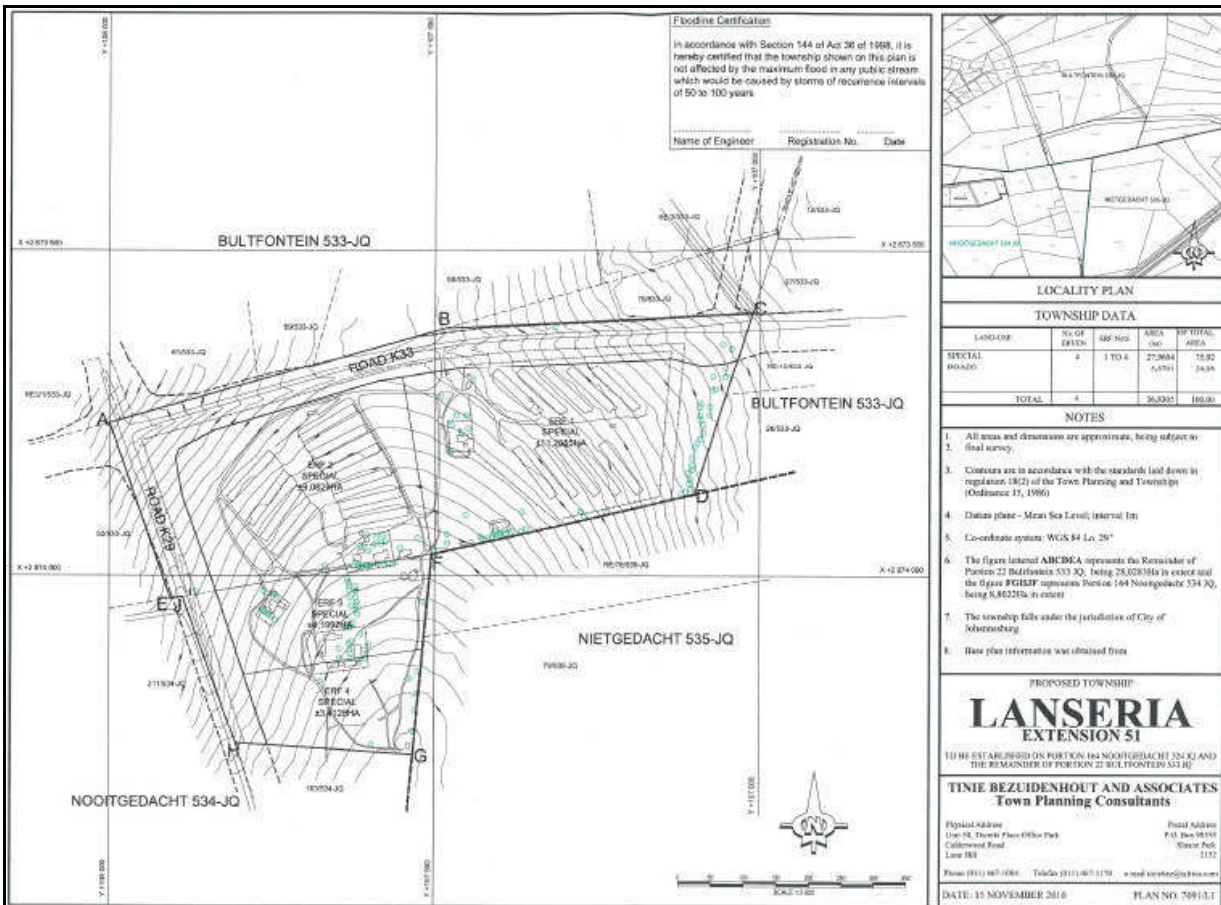


Figure 7: Final Layout

5.5 Planning Approach

Based on the above, the planning approach will be an inclusive, analytical, and systematic process undertaken/done by a complete professional team consisting of Land

Surveyors, Town Planners, Urban Planners, Traffic Engineers, Urban Economists, Environmental Consultants, Civil Engineers, Electrical Engineers, Geotechnical Engineers and the developer.

The project team has already compiled a preliminary layout for the development, from the information currently available. **(Refer to Figure 7: The Preliminary Layout Map).**

The proposed land-uses for the preliminary layout are as follows:

Table 6: Proposed Land Uses based on the Preliminary Layout

| ZONING | ERF No's | AREA Ha | OF TOTAL AREA |
|---|----------|--------------------|-----------------|
| SPECIAL ROADS | 1 TO 4 | 27, 9604 8,8701 | 75,92 24, 08 |
| "Special", including Residential dwelling units, Hotels Wholesale/Retail, Warehouses, Workshops, Showrooms, Exhibition and Distribution Centers, Restaurants, Offices, Places of Amusement, Medical Consulting Rooms and Places of Instruction. | 1 TO 4 | 27, 9604 8,8701 | 75,92 24, 08 |

An effort was already made (during the preliminary layout phase) not only to make use of the opportunities, but to utilise the terrain, site features, visibility and access to the best benefit of all, including the surrounding environment.

6. THE DESCRIPTION OF THE BIOPHYSICAL AND SOCIO-ECONOMICAL ENVIRONMENTS – (In line with Section 32 (d))

This section briefly describes the biophysical and socio-economical environments. It also lists the anticipated adverse and beneficial impacts of the proposed development on the environment. Where possible, mitigation measures were supplied for the adverse impacts and the significance of the impacts listed was also indicated in specific impact tables. In

some cases the impacts (i.e. the availability of water for the proposed development) have already (during the planning phase) been addressed to such an extent that it was not regarded as necessary to carry the impacts over to the significance rating section of the report.

Although it was not necessary to mitigate the positive impacts listed in the impacts tables, the positive impacts identified in this section of the report will also automatically be carried over to the significance rating section of the report to indicate the specific benefits associated with the proposed development. This will also make it possible to compare the severity of the adverse impacts with the advantages of the beneficial impacts and to eventually make an informed decision regarding the proposed development.

6.1 THE BIO-PHYSICAL ENVIRONMENT

The following information incorporates the most important information supplied by specialist studies and reports.

6.1.1 The Physical Environment

6.1.1.1 Geology and Soils

A Geotechnical site analysis was carried out by Intraconsult Consulting Engineering Geologists. ***(Please refer to Annexure G1 for the Geotechnical Site Analysis).***

The site is situated near a crest of a hill in the south eastern corner with gentle slopes to the north, north west and north east. The study area contains poultry farm buildings and scattered farm houses used by staff.

The site is underlain by bedrocks of the Halfway House Granite Site which consists mostly of granite and granite gneiss of the Basement Complex. These bedrocks have been intruded by basic igneous rocks. The residual soils are only partly or thinly developed across the site

and comprise of gravelly silty sands and clayey silts. The overlying transported soils are predominantly silty (fine) sandy materials.

The residual soils are only partly or thinly developed across the site and comprise of gravelly silt sands and clayey silts. The overlying transported soils are predominantly fine sandy materials. The general soil 'types' uncovered during these investigations are as follows:

- **Hillwash**

Moist, grey brown, loose to medium dense intact medium and fine sand with roots.

- **Pebble Marker**

Closely packed medium and fine grained, sub-angular and angular quartz gravels with ferruginous concretions and nodules, generally loose to medium dense, intact to friable. .

- **Reworked residual granite**

Moist, orange brown mottled and blotched grey and buff, dense, clayey sand, occasionally ferruginised.

- **Reworks residual diabase**

Moist, orange blotched dark grey and brown mottled black, stiff shattered clayed silt.

- **Residual diabase**

Moist, pale green speckled black blotched orange, stiff, relict jointed slightly clayey silt.

6.1.1.1.a Issues & Impact Identification - Geology and Soils

Table 7: Issues and Impacts – Geology and Soils

| | Issue/ Impact | Positive/ Negative/ Neutral ± | Mitigation Possibilities High 🟢 Medium 🟡 Low 🔴 Positive Impact - Not |
|--|---------------|-------------------------------------|--|
| | | | |

| | | | Necessary To Mitigate ☀ |
|----|--|---|-------------------------|
| 1) | Restriction on land use types due to geology. | - | 😊 |
| 2) | Risk for formation of sinkholes and dolines | - | 😐 |
| 3) | Stability of structures | - | 😊 |
| 4) | Excavation problems are likely where dolomite pinnacles are present close to surface and blasting may be required. | - | 😊 |
| 5) | Erosion | - | 😐 |
| 6) | Stockpile areas for construction materials and topsoil | - | 😐 |

6.1.1.1.b Discussion of issues identified, possible mitigation measures and significance of issue after mitigation

1) Restriction on land use types due to geology.

The land uses are restricted due to underlying dolomite and the land uses and layout plan for the proposed development must correspond to the stability zonation and development types recommended by the involved geotechnical engineer.

Table 8: Significance of Issue 1 (Restriction on land use types) After Mitigation

| Mitigation Possibilities | Mitigation | Significance of Issue after mitigation |
|---|--|--|
| High 😊 Medium 😐 Low 🟡 Positive Impact/ Neutral - Not Necessary To Mitigate ☀ | Already achieved ✓ Must be implemented during P lanning phase, C onstruction and/ or O perational phase P / C / O Mitigation | Low/ eliminated L / E Medium M High H Not possible to mitigate, but not regarded as a fatal flaw NP |

| | | |
|---------------|--|----------------------------------|
| High 🟡 | P & C The layout and land uses must correspond to the stability zonation and development types recommended by the geotechnical engineer. | L - To be included in EMP |
|---------------|--|----------------------------------|

Result:

Although issue can be mitigated, the significance of the impact should still be determined / confirmed and assessed in the Significance Rating Table

2) Risk for formation of sinkholes and dolines

If the NHBRC precautionary measures for development on dolomite are not implemented there is a risk for the formation of sinkholes and dolines. Any water infiltration such as leaking pipes could cause sinkholes.

Table 9: Significance of Issue 2 (Risk for formation of sinkholes and dolines) After Mitigation

| Mitigation Possibilities High 🟡 Medium 🟠 Low 🟢 Positive Impact/ Neutral - Not Necessary To Mitigate ⚙️ | Mitigation Already achieved ✓ Must be implemented during P lanning phase, C onstruction and/ or O perational phase P / C / O Mitigation | Significance of Issue after mitigation Low/ eliminated L / E Medium M High H Not possible to mitigate, but not regarded as a fatal flaw NP |
|--|--|---|
| Medium 🟠 | P & C - The NHBRC precautionary measures for development in dolomitic areas must be implemented. P, C & O - A dolomite risk management plan must be compiled for this township in general and copies must be submitted to the Council for | H - To be included in EMP H - To be included in EMP |

| | | |
|--|--|--|
| | underground wet services, applicable to dolomitic terrain and in compliance with the Tshwane Metropolitan Municipality should be adhered to. | |
|--|--|--|

Result:

Although issue can be mitigated, the significance of the impact should still be determined / confirmed and assessed in the Significance Rating Table

3) Stability of structures

The foundation recommendations by the geotechnical engineers should be implemented to ensure the stability of structures.

Table 10: Significance of Issue 3 (Stability of structures) After Mitigation

| Mitigation Possibilities High 🟢 Medium 🟡 Low 🔴 Positive Impact/ Neutral - Not Necessary To Mitigate ✨ | Mitigation | Significance of Issue after mitigation |
|---|--|--|
| | Already achieved ✓ Must be implemented during Planning phase, Construction and/ or Operational phase P / C / O Mitigation | Low/ eliminated L / E Medium M High H Not possible to mitigate, but not regarded as a fatal flaw NP |
| High 🟢 | <p>P & C – The precautionary measures for construction on dolomite must be implemented</p> <p>P & C – The foundation recommendations supplied by the geotechnical engineers must be adhered to.</p> <p>P & C – It is recommended that excavations (for foundations and underground services) be</p> | <p>M - To be included in EMP</p> <p>M - To be included in EMP</p> |

| | | |
|--|---|---|
| | <p>inspected on the site to ensure that conditions at variance to that described can be noted and the necessary adjustments made.</p> <p>P & C – Detailed foundation inspections should be carried out at the time of construction to identify variances and adjust foundation designs accordingly if need be.</p> | <p>M - To be included in EMP</p> <p>M - To be included in EMP</p> |
|--|---|---|

Result:

Although issue can be mitigated, the significance of the impact should still be determined / confirmed and assessed in the Significance Rating Table

4) Excavatability problems are foreseen and some blasting exercises may be required

Excavation problems are likely where dolomite pinnacles are present close to surface and blasting may be required.

Table 11: Significance of Issue 4 (Excavatability problems are foreseen and some blasting exercises may be required) After Mitigation

| Mitigation Possibilities High 🟢 Medium 🟡 Low 🟠 Positive Impact/ Neutral - Not Necessary To Mitigate ✨ | Mitigation | Significance of Issue after mitigation |
|---|---|---|
| | <p>Already achieved ✓</p> <p>Must be implemented during Planning phase, Construction and/ or Operational phase</p> <p>P / C / O Mitigation</p> | <p>Low/ eliminated L / E</p> <p>Medium M</p> <p>High H</p> <p>Not possible to mitigate, but not regarded as a fatal flaw NP</p> |
| High 🟢 | <p>C – Surrounding residents must be informed of blasting exercises at least one week in advance.</p> <p>C – Blasting operations should be carefully controlled and the necessary safety precautions must be implemented.</p> | <p>M - To be included in EMP</p> <p>M - To be included in EMP</p> |

Result:

Although issue can be mitigated, the significance of the impact should still be determined / confirmed and assessed in the Significance Rating Table

5) Erosion

Unnecessary clearing of vegetation could lead to exposed soils prone to erosive conditions. Insufficient soil coverage after placing of topsoil, especially during construction where large surface areas are applicable could also cause erosion. The management of surface water run-off during construction is very important to prevent soils erosion on the site. If construction takes place during the rainy season, sufficient storm water management will be required to manage water runoff.

Table 12: Significance of Issue 5 (Erosion) After Mitigation

| Mitigation Possibilities High 🟢 Medium 🟡 Low 🔴 Positive Impact/ Neutral - Not Necessary To Mitigate ⚡ | Mitigation Already achieved ✓ Must be implemented during Planning phase, Construction and/ or Operational phase P / C / O Mitigation | Significance of Issue after mitigation Low/ eliminated L / E Medium M High H Not possible to mitigate, but not regarded as a fatal flaw NP |
|--|--|--|
| Medium 🟡 | <p>P & C - A storm water management plan must be compiled for the construction and operational phases of the proposed development.</p> <p>P & C - The storm water management plan must be submitted to the local authority and Council for Geoscience for approval.</p> <p>P & C - Due to the fact that most of the study area is</p> | <p>M - To be included in EMP</p> <p>M - To be included in EMP</p> |

| | | |
|--|--|---|
| | <p>underlain by dolomite no natural channels will be allowed. All open channels and attenuation ponds must be lined with concrete. Concentrated surface drainage is also not permitted.</p> <p>P & C – Large exposed areas during the construction phases should be limited. Where possible areas earmarked for construction during later phases should remain covered with vegetation coverage until the actual construction phase. This will prevent unnecessary erosion and siltation in these areas.</p> <p>P & C - Rehabilitate exposed areas immediately after construction in these areas is completed (not at the end of the project).</p> <p>P – Specifications for topsoil storage and replacement to ensure sufficient soil coverage as soon as possible after construction must be implemented.</p> <p>P & C – All embankments must be adequately compacted and planted with grass to stop any excessive soils erosion and scouring of the landscape.</p> <p>C – Storm water diversion measures are recommended to control peak flows during thunder storms.</p> <p>P & C – The eradication of alien vegetation should be followed up as soon as possible by replacement with indigenous vegetation to ensure quick and sufficient coverage of exposed</p> | <p>L - To be included in EMP</p> <p>M - To be included in EMP</p> <p>M - To be included in EMP</p> <p>M - To be included in EMP</p> <p>M - To be included in EMP</p> <p>M - To be included in EMP</p> <p>M - To be included in EMP</p> |
|--|--|---|

| | | |
|--|--------|--|
| | areas. | |
|--|--------|--|

Result:

Although issue can be mitigated, the significance of the impact should still be determined / confirmed and assessed in the Significance Rating Table

6) Stockpile areas for construction materials and topsoil

Designated areas for stockpiling of construction materials must be specified by the Environmental Control Officer in an area that is already disturbed. Stockpiling in the wrong areas might be detrimental to fauna and flora and will deplete the soil quality. Topsoil should be stockpiled as specified in the EMP to ensure that the soil quality doesn't deplete and that the grass seed remain in the soil for later rehabilitation of the disturbed areas.

In addition to the impact discussed in the paragraph above, rainwater falling onto stockpiles may become polluted with dust originating from aggregate and other construction material, such as bitumen from pre-mix stockpiles. Therefore stockpiles of topsoil should be correctly covered to prevent this as well as loss of topsoil by wind erosion.

The footprint of stockpile areas will be contaminated with the stored material and will require cleaning before rehabilitation.

Table 13: Significance of Issue 6 (Stockpile areas for construction materials and topsoil) After Mitigation

| | | |
|---|---|---|
| <p>Mitigation Possibilities</p> <p>High 🟢 Medium 🟡 Low 🔴</p> <p>Positive Impact/ Neutral - Not Necessary To Mitigate ✨</p> | <p>Mitigation</p> <p>Already achieved ✓</p> <p>Must be implemented during Planning phase, Construction and/ or Operational phase</p> <p>P / C / O Mitigation</p> | <p>Significance of Issue after mitigation</p> <p>Low/ eliminated L / E</p> <p>Medium M</p> <p>High H</p> <p>Not possible to mitigate, but not regarded as a fatal flaw NP</p> |
|---|---|---|

| | | |
|------------------|---|---|
| Medium ☹️ | <p>C - Rehabilitation works must be done immediately after the involved works are completed.</p> <p>C -All compacted areas should be ripped prior to them being rehabilitated/landscaped.</p> <p>P/C - The top layer of all areas to be excavated must be stripped and stockpiled in areas where this material will not be damaged, removed or compacted. This stockpiled material should be used for the rehabilitation of the site and for landscaping purposes.</p> <p>C - Strip topsoil at beginning of works and store in stockpiles no more than 1,5 m high in designated materials storage area.</p> <p>C - Stockpiles should be covered correctly.</p> | <p>M - To be included in EMP</p> <p>M - To be included in EMP</p> <p>M - To be included in EMP</p> <p>M - To be included in EMP</p> <p>M - To be included in EMP</p> |
|------------------|---|---|

Result:

Although issue can be mitigated, the significance of the impact should still be determined / confirmed and assessed in the Significance Rating Table

6.1.1.2 Hydrology

6.1.1.2.a Surface Hydrology

The study area is **not** affected by 1:50 and 1:100 year flood lines.

No wetlands are found on the site. The Non-Perennial Rivers, wetlands and other water bodies are around the study area. The western side of the study area gently drains towards the north-west and the east side drains towards the north-east. **(Refer to Figure 8, Surface Hydrology Map).**

It is expected that the slope will be sufficient to allow for natural storm water drainage as well as for the installation of essential services. The topographical characteristics will have no detrimental effect on the development potential of the site.

Flood lines: The site is not subject to floods with an expected frequency of 1:50 years or 1:100 years.

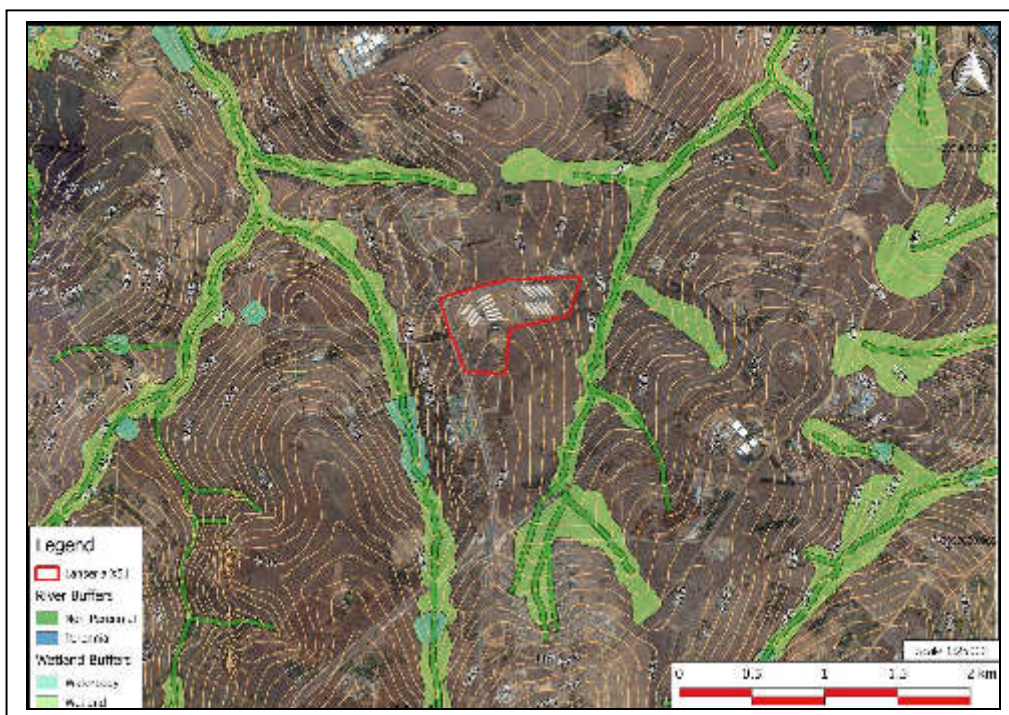


Figure 8: Hydrology Map

6.1.1.2.b Sub-Surface Hydrology

The site is a typical hard rock environment where two distinct aquifer systems are anticipated. There is firstly a shallow primary weathered aquifer and secondly the possibility of deeper secondary aquifer systems associated with fractures, joints and other discontinuities within the bedrock mass. In the case of the primary aquifer on this site, the opened trial holes indicate an abrupt transition from the topmost soil horizons to the shallow bedrocks in the lower profile with groundwater perched on top of these practically impermeable materials. The perched and secondary aquifers are recharged by rainfall.

6.1.1.2 c Flood Lines

In terms of the requirements of section 144 of the National Water Act, 1998 (Act 36 of 1998) the proposed township is **not** affected by a flood line with an expected frequency of 1:50 years or 1:100 years.

6.1.1.2.d Issues and Impacts – Hydrology

Table 14: Issues and Impacts – Hydrology

| | Issue/ Impact | Positive/ Negative/ Neutral ± | Mitigation Possibilities High 🟢 Medium 🟡 Low 🔴 Positive Impact/ Neutral - Not Necessary To Mitigate 🌞 |
|----|---|-------------------------------------|--|
| 7) | Siltation, erosion and water pollution could occur in the tributary of the nearby rivers if a storm water management plan is not implemented. | - | 🟡 |
| 8) | Lowering of groundwater | - | 🟡 |
| 9) | Groundwater pollution | - | 🟡 |

6.1.1.2.e Discussion of issues identified, possible mitigation measures and significance of issue after mitigation

7) Siltation, erosion and water pollution of the unnamed, tributary of the Rietspruit, could occur if a Storm Water Management plan is not implemented.

If erosion, siltation and water pollution is not addressed, the sustainability of the non-perennial river can be negatively impacted by the development.

Table 15: Significance of Issue 7 (Siltation, erosion and water pollution) After Mitigation/ Addressing of the Issue

| <p>Mitigation Possibilities</p> <p>High 🟢 Medium 🟡 Low 🔴</p> <p>Positive Impact/ Neutral - Not Necessary To Mitigate ✨</p> | <p>Mitigation</p> <p>Already achieved ✓</p> <p>Must be implemented during Planning phase, Construction and/ or Operational phase</p> <p>P / C / O Mitigation</p> | <p>Significance of Issue after mitigation</p> <p>Low/ eliminated L / E</p> <p>Medium M</p> <p>High H</p> <p>Not possible to mitigate, but not regarded as a fatal flaw NP</p> |
|---|--|---|
| <p>Medium 🟡</p> | <p>P / C / O -</p> <p>The storm water design for the proposed development must be designed to:</p> <ul style="list-style-type: none"> - Prevent bank and riparian zone erosion especially in the upper section of the main tributary. - Reduce and/ or prevent siltation, erosion and water pollution. If erosion, siltation and water pollution is not addressed, the sustainability of the drainage and the open space systems especially in the upper section of the main tributary can be negatively impacted by the development. - Storm water runoff should not be concentrated as far as possible and sheet runoff from paved surfaces need to be curtailed. - Runoff from paved | <p>M - To be included in EMP</p> |

| | | |
|--|--|--|
| | <p>surfaces should be slowed down by the strategic placement of berms.</p> <ul style="list-style-type: none"> - The vegetation must be retained as far as possible, and rehabilitated if disturbed by construction activities to ensure that erosion and siltation do not take place. - No trees should be planted within five meters of the line of the water bearing services. | |
|--|--|--|

Result:

Although issue can be mitigated, the significance of the impact should still be determined / confirmed and assessed in the Significance Rating Table.

8) Lowering of groundwater.

Any local or regional artificial lowering of the groundwater may impact negatively on the stability of portions of the site and the surrounding areas.

Table 16: Significance of Issue 8 (Lowering of groundwater) After Mitigation/ Addressing of the Issue

| | | |
|---|--|---|
| <p>Mitigation Possibilities</p> <p>High 🟢 Medium 🟡 Low 🔴</p> <p>Positive Impact/ Neutral - Not Necessary To Mitigate ✨</p> | <p>Mitigation</p> <p>Already achieved ✓</p> <p>Must be implemented during planning phase, construction and/ or operational phase</p> <p>P / C / O</p> | <p>Significance of Issue after mitigation</p> <p>Low/ eliminated L / E</p> <p>Medium M</p> <p>High H</p> <p>Not possible to mitigate, but not regarded as a fatal flaw NP</p> |
| <p>Medium 🟡</p> | <p>P / C / O -</p> <ul style="list-style-type: none"> • On-going monitoring of | <p>M - To be included in EMP</p> |

| | | |
|--|--|--|
| | groundwater levels on and in the immediate vicinity of the site is essential. <ul style="list-style-type: none"> • Ground water management will need to form an integral part of the Dolomite Risk Management Strategy. | |
|--|--|--|

Result:

Although issue can be mitigated, the significance of the impact should still be determined / confirmed assessed in the Significance Rating Table.

9) Groundwater pollution

The dolomitic formation is regarded as the best aquifer in South Africa and it has a very high yielding and storage capacity as well as a high recharge potential. The ground water pollution potential on the study area is regarded as high and if not planned and managed correctly, the construction and operational phases of the proposed road could cause sub-surface water pollution.

The Storm Water Management plan must be designed to:

- Reduce and/ or prevent siltation, erosion and water pollution; and
- Improve the surface and ground water quality of the study area and the lower lying areas within the catchment area.

Table 17: Significance of Issue 9 (Ground water pollution) After Mitigation/ Addressing of the Issue

| | | |
|---|--|--|
| <p>Mitigation Possibilities</p> <p>High 🟢 Medium 🟡 Low 🔴</p> <p>Positive Impact/ Neutral - Not Necessary To Mitigate ⚡</p> | <p>Mitigation</p> <p>Already achieved ✓</p> <p>Must be implemented during planning phase, construction and/ or operational phase</p> <p>P / C / O</p> | <p>Significance of Issue after mitigation</p> <p>Low/ eliminated L / E</p> <p>Medium M</p> <p>High H</p> <p>Not possible to mitigate,</p> |
|---|--|--|

| | | |
|------------------|--|--|
| | | but not regarded as a fatal flaw NP |
| Medium ☹️ | P/C/O - Compilation of a storm water management plan that will address storm water management during the construction and operational phases of the project | M - To be included in EMP |

Result:

Although issue can be mitigated, the significance of the impact should still be determined / confirmed and assessed in the Significance Rating Table.

6.1.1.3 Topography

There is a gentle slope towards the west section of the study area. The proposed development will be visible from the surrounding properties and roads that are in the same elevation and topography.

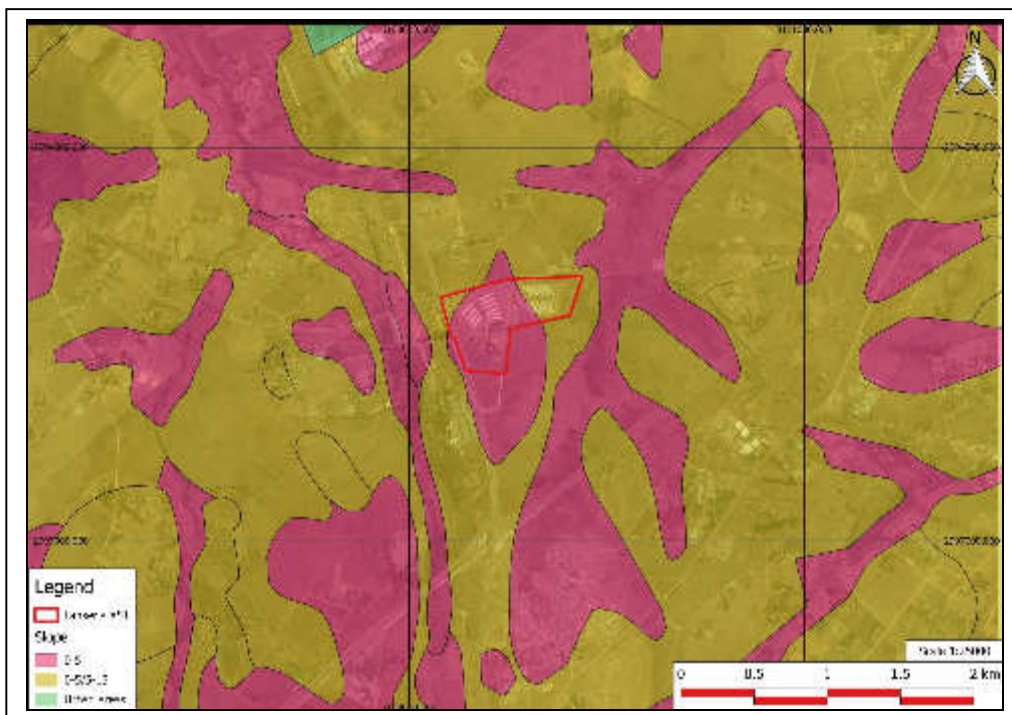


Figure 9: Slope Map

6.1.1.3a Issues & Impact Identification – Topography

Table 18: Issues and Impacts – Topography

| | Issue/ Impact | Positive/ Negative/ Neutral ± | Mitigation Possibilities High 🟢 Medium 😊 Low 🟡 Positive Impact - Not Necessary To Mitigate 🌟 |
|-----|--|-------------------------------------|--|
| 10) | The topographical characteristics will have no detrimental effect on the development potential of the site. | + | 🌟 |
| 11) | If not planned correctly, roofs and parking areas could reflect the sun into the eyes of oncoming traffic and surrounding landowners. | - | 😊 |
| 12) | If not planned and managed correctly the lights (interior and exterior) and the signage of the development could cause visual pollution. | - | 🟢 |

6.1.1.3b Discussion of issues identified, possible mitigation measures and significance of issue after mitigation

11) If not planned correctly, roofs and parking areas could reflect the sun into the eyes of oncoming traffic and surrounding landowners and hikers.

Although the nuisance factor of this impact is regarded as high, it is easy to mitigate. The roof materials used for buildings and structures must be non-reflective materials and trees with wider canopies should be planted in areas visible from the higher view sheds and

shrubs should be planted at strategic points to screen-off cars that are visible from the lower lying surrounding properties. Walls and earth berms could also be used to screen-off the impacts of cars in parking areas.

Table 19: Significance of Issue 11 (Roofs and Parking Areas Could Reflect the Sun into the Eyes of Oncoming Traffic and Surrounding Landowners and Hikers) After Mitigation/ Addressing of the Issue

| Mitigation Possibilities High 🟢 Medium 🟡 Low 🔴 Positive Impact/ Neutral - Not Necessary To Mitigate ✨ | Mitigation Already achieved ✓ Must be implemented during planning phase, construction and/ or operational phase P / C / O | Significance of Issue after mitigation Low/ eliminated L / E Medium M High H Not possible to mitigate, but not regarded as a fatal flaw NP |
|--|---|--|
| High 🟢 | P/C – Roof materials used for buildings and structures must be non-reflective materials and not bright. P – Suitable plant materials should be used at strategic points to screen off impacts caused by roofs and cars in large parking areas. | L - To be included in EMP L – To be incorporated as part of the EMP |

Result:

Although issue can be mitigated, the significance of the impact should still be determined / confirmed assessed in the Significance Rating Table.

- 12) If not planned and managed correctly, the lights of the development (exterior and interior) and the lights of signage could cause visual pollution during the night.**

If not planned and managed correctly, the exterior lighting (i.e. flood lights) associated with the development could have a visual impact and especially be of nuisance to traffic on nearby roads. The placement of the exterior lighting and the type of exterior light and globes to be used in the landscape will determine the level of pollution.

Table 20: Significance of Issue 12 (The Lights Of The Development (Exterior And Interior) And The Lights Of Signage Could Cause Visual Pollution During The Night) After Mitigation/ Addressing of the Issue

| Mitigation Possibilities High 🟢 Medium 🟡 Low 🔴 Positive Impact/ Neutral - Not Necessary To Mitigate ✨ | Mitigation Already achieved ✓ Must be implemented during planning phase, construction and/ or operational phase P / C / O | Significance of Issue after mitigation Low/ eliminated L / E Medium M High H Not possible to mitigate, but not regarded as a fatal flaw NP |
|--|--|--|
| High 🟢 | P/C – The generation of light by night events, security lighting and other lighting shall be effectively designed so as not to spill unnecessary outward into the oncoming traffic, or into the yards of the neighbouring properties or open spaces. | L - To be included in EMP |

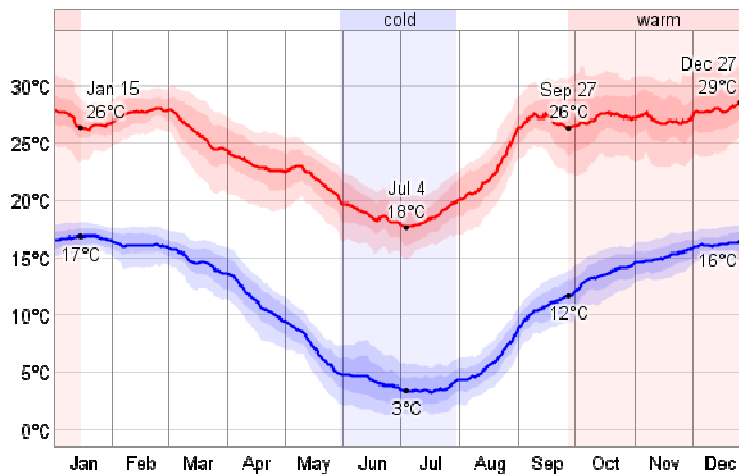
Result:

Although issue can be mitigated, the significance of the impact should still be determined / confirmed assessed in the Significance Rating Table.

6.1.1.4 Climate

The climatological data for the site was taken from the weather station at Lanseria based at 1377m.

Table 3: Daily High and Low Temperatures



Wind

The wind is most often out of the *north* (10% of the time). The wind is least often out of the west (4% of the time) and south (5% of the time).

Temperature

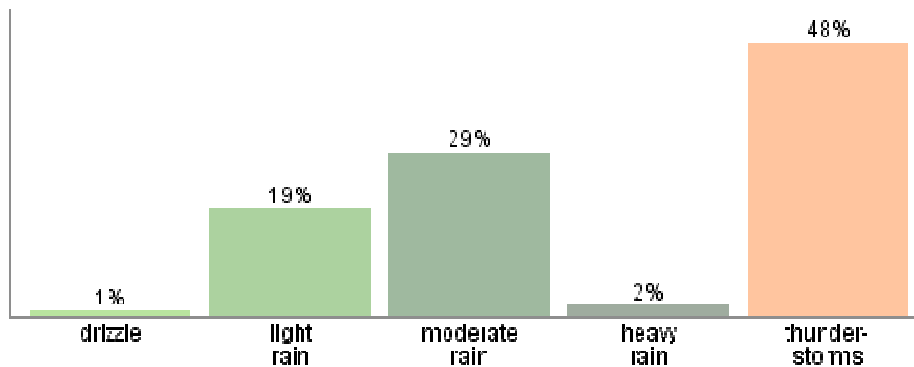
In summer the average maximum temperature is 26.7 °C and the average minimum 14.4 °C. During the winter average maximum temperature is 18.2 °C and minimum 2.7 °C.

Rain

The average annual rainfall of the area is 717 mm, with a maximum of 960 mm and a minimum of 559 mm. Over the entire year, the most common forms of precipitation are thunderstorms, moderate rain, and light rain. *Thunderstorms* are the most severe precipitation observed during 48% of those days with precipitation. They are most likely around January 20, when it is observed during 20% of all days. *Moderate rain* is the most severe precipitation observed during 29% of those days with precipitation. It is most likely

around January 12, when it is observed during 12% of all days. *Light rain* is the most severe precipitation observed during 19% of those days with precipitation. It is most likely around January 4, when it is observed during 8% of all days.

Table 21: Types of Precipitation throughout the year



Mist

10 Days

Lighting

87 Days

Hail

4 Days

Should the construction phase be scheduled for the summer months, frequent rain could cause very wet conditions, which makes construction and environmental rehabilitation works extremely difficult. Such wet conditions often cause delays to building projects and the draining of water away from the construction works (in case of high water tables) into the nearby water bodies, could (if not planned and managed correctly) have an impact on the water quality of these water bodies.

If dry and windy conditions occur during the construction phase, dust pollution could become a problem.

6.1.1.5a Issues & Impact Identification – Climate

Table 22: Issues and Impacts – Climate

| | Issue/ Impact | Positive/ Negative/ Neutral ± | Mitigation Possibilities High 🟢 Medium 😊 Low 🟡 Positive Impact - Not Necessary To Mitigate 🌞 |
|-----|--|-------------------------------------|--|
| 13) | Should the construction phase be scheduled for the summer months, frequent rain could cause very wet conditions, which makes it extremely difficult to build in and to do rehabilitation works of disturbed areas. | - | 😊 |
| 14) | If dry and windy conditions occur during the construction phase, dust pollution could become a problem. | - | 😊 |

6.1.1.5b Discussion of issues identified, possible mitigation measures and significance of issue after mitigation

- 13) Should the construction phase be scheduled for the summer months, frequent rain could cause very wet conditions, which makes it extremely difficult to build in and to do rehabilitation works of disturbed areas.**

These wet conditions often cause delays to building projects and the draining of water away from the construction works (in the case of high water tables) into the water bodies of the adjacent properties, could (if not planned and managed correctly) have an impact on the water quality of these water bodies.

Table 23: Significance of Issue 13 (Wet conditions): After Mitigation/ Addressing of the Issue

| <p>Mitigation Possibilities</p> <p>High 🟢 Medium 🟡 Low 🔴</p> <p>Positive Impact/ Neutral - Not Necessary To Mitigate ✨</p> | <p>Mitigation</p> <p>Already achieved ✓</p> <p>Must be implemented during planning phase, construction and/ or operational phase</p> <p>P / C / O</p> | <p>Significance of Issue after mitigation</p> <p>Low/ eliminated L / E</p> <p>Medium M</p> <p>High H</p> <p>Not possible to mitigate, but not regarded as a fatal flaw NP</p> |
|---|---|---|
| <p>High 🟢</p> | <p>P/C – Construction workers and construction vehicles and machinery must stay out of the soggy areas during the wet periods. Barrier tape should be used to demarcate the areas that are drenched with water (especially the ecologically sensitive areas and the areas covered with valuable topsoil) and it should only be removed when the appointed Environmental Control Officer (ECO)/ site supervisor/ project manager/ main contractor regard the conditions in the affected areas as favourable.</p> <p>P – The main contractor and sub-contractors must be informed of the potential wet conditions that could occur in some of the areas and the contractor must allow for some delays during the wet periods in</p> | <p>L - To be included in EMP</p> <p>L – To be included as part of the EMP</p> |

| | | |
|--|---|--|
| | his tender documents and project programme. | |
|--|---|--|

Result:

Although issue can be mitigated, the significance of the impact should still be determined / confirmed assessed in the Significance Rating Table.

14) If dry and windy conditions occur during the construction phase, dust pollution could become a problem.

The negative impact of dust is generally associated with the construction phase and is temporary. The impact should however be considered in context with the surrounding area that currently has a distinctive rural character with a combination of residential development, agricultural activities and open space areas provided by agricultural properties. The dust pollution during the construction phase will most probably not be regarded as that unusual.

Sweeping of the construction site, clearing of builders' rubble and debris as well as the regular watering of the construction site (storage areas, roads etc.) must take place at least once a day.

Table 24: Significance of Issue 14 (Dust Pollution) After Mitigation/ Addressing of the Issue

| Mitigation Possibilities | Mitigation | Significance of Issue after mitigation |
|---|---|---|
| High 🟢 Medium 🟡 Low 🟠 Positive Impact/ Neutral - Not Necessary To Mitigate ✨ | Already achieved ✓ Must be implemented during planning phase, construction and/ or operational phase P / C / O | Low/ eliminated L / E Medium M High H Not possible to mitigate, but not regarded as a fatal flaw NP |
| High 🟢 | P/C - Sweeping of the construction site, clearing of | L - To be included in EMP |

| | | |
|--|---|--|
| | builders' rubble and debris as well as the regular watering of the construction site (storage areas, roads etc.) must take place at least once a day. | |
|--|---|--|

Result:

Although issue can be mitigated, the significance of the impact should still be determined / confirmed assessed in the Significance Rating Table.

6.1.2 THE BIOLOGICAL ENVIRONMENT

Refer to Annexure G2 for the Fauna and Flora Survey.

The proposed site lies in the quarter degree grid cell 2528CA (Pretoria). Mucina and Rutherford (2006) classified the area as Egoli Granite Grassland, with archaean granite and gneiss of the Halfway House Granite at the core of the Johannesburg Dome supporting leached, shallow, coarsely grained, sandy soil poor in nutrients. This grassland falls within a strongly seasonal summer- rainfall region and very dry winters with frequent frosts.

This vegetation unit is considered endangered. Its conservation target is 24%. Only about 3% of this vegetation unit is conserved in statutory reserves and a few private conservation areas. More than two-thirds of the unit has already undergone transformation, mostly by urbanization, cultivation and by building the roads. Current rates of transformation threaten most of the remaining areas that are not conserved.

According to GDARD C-Plan the study area is not located on any irreplaceable sites ***(refer to Figure 4).***

The study area

Galago Environmental stated that the study area lies in the quarter degree grid cell 2528CA (Pretoria). Mucina and Rutherford (2006) classified the area as Egoli Granite Grassland, with archaean granite and gneiss of the Halfway House Granite at the core of the Johannesburg Dome supporting leached, shallow, coarsely grained, sandy soil poor in nutrients. This grassland falls within a strongly seasonal summer- rainfall region and very dry winters with frequent frosts.

This vegetation unit is considered endangered. Its conservation target is 24%. Only about 3% of this vegetation unit is conserved in statutory reserves and a few private conservation areas. More than two-thirds of the unit has already undergone transformation, mostly by urbanization, cultivation and by building the roads.

Current rates of transformation threaten most of the remaining areas that are not conserved. According to GDARD C-Plan the study area is not located on any irreplaceable sites (**Refer to Figure 4**).

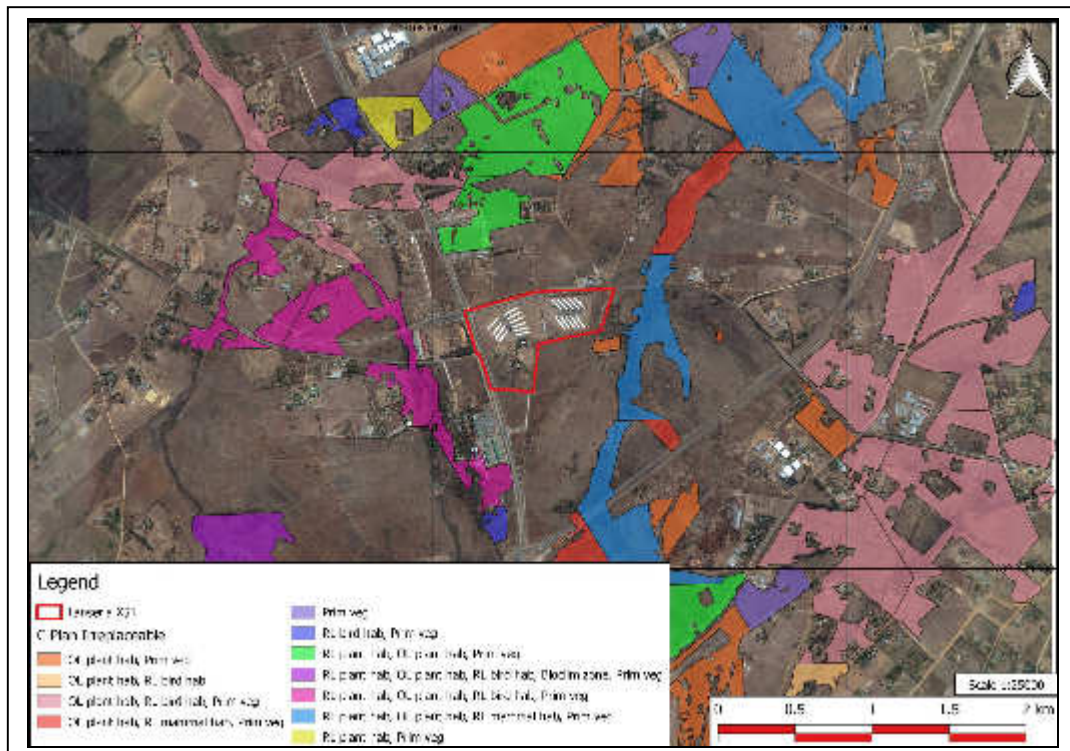


Figure 4: GDARD C-PLAN

6.1.2.1 Vegetation

Galago Environmental CC was appointed to conduct a vascular flora and vertebrate fauna survey requested for the proposed Lanseria x51 development on Portion 22 of the Farm Bullfontein 533 JQ and Portion 164 of the Farm Nooitgedacht 534 JQ.

Two vegetation communities were identified:

- *Eragrostis- Hyparrhenia grassland*; and
- Mixed alien and indigenous vegetation.

Medicinal plants

Of the 59 plant species recorded on the site, 2 species with medicinal properties were found. Both of the medicinal plants found on the site was situated in the *Eragrostis - Hyparrhenia grassland*.

Alien plants

Twenty alien plant species, of which two were Category 2 Declared invaders and four were Category 3 Declared invaders, were recorded on the study site.

Orange-listed species

The habitat was suitable for one of the five Orange List Plant species known to occur in the 2527DD quarter degree grid cell, but this species, *Hypoxis hemerocallidea* (African potato) was not found.

Red-listed species

Eleven Red List plant species are known to occur in the 2527DD quarter degree grid cell, but the habitat was not suitable for any of these species.

6.1.2.1a *Eragrostis – Hyparrhenia grassland*

According to the specialist this vegetation unit comprised natural grassland that was mown short, which hampered identification of the species. Connectivity with natural grassland existed to the south, but was limited by Road K512 to the west and highway N14 to the south. Of the 59 plant species recorded on the study site, 47 were recorded in the *Eragrostis – Hyparrhenia grassland*. Of these, 38 were indigenous species.

The habitat of this study unit was not suitable for any of the Red Listed species. This vegetation was not considered sensitive.

Both of the medicinal species recorded on the study site were found in this study unit. Nine of the 20 alien species recorded on the site were found in this study unit. None of these species were declared invaders.

6.1.2.1b Mixed alien and indigenous vegetation

This study unit comprised garden vegetation and degraded grassland surrounding the chicken hatcheries. Of the 59 plant species recorded on the study site 31 were recorded in the Mixed alien and indigenous vegetation. Of these, 14 indigenous species.

Of the 38 medicinal species recorded on the site, 16 were found in the Ridge vegetation community. No alien species were observed.

The habitats of this site were not suitable for any Red List or Orange List species known to occur in the quarter degree grid cell. No medicinal species were recorded in this study unit. Seventeen of the 20 alien species recorded on the site were found in this study unit. Of these, two were Category 2 Declared invaders and four were Category 3 Declared invaders.

The vegetation of this study unit was not considered sensitive.

Conclusions and recommendations made by Galago Environmental:

Most of the study site comprised mixed alien and indigenous vegetation. The natural grassland on the site was kept short. The study site had only limited connectivity with natural grassland to the south.

The following mitigation measures were developed by GDARD and are applicable to the study site:

- An appropriate management authority that must be contractually bound to implement the EMP and ROD during the operational phase of the development should be identified and informed of their responsibilities in terms of the EMP and ROD;
- Only indigenous plant species, preferably species that are indigenous to the natural vegetation of the area, should be used for landscaping in communal areas, as far as possible, plants naturally growing on the development site, but would otherwise be destroyed during cleaning for development purposes, should be incorporated into landscaped areas. Forage and host plants required by pollinators should also be planted in landscaped area.

6.1.2.2 Vertebrate Faunal Survey

Mammals

The local occurrences of mammals are closely dependent on broadly defined habitat types, in particular terrestrial, arboreal (tree-living), rupicolous (rock-dwelling) and wetland-associated vegetation cover. It is thus possible to deduce the presence or absence of mammal species by evaluating the habitat types within the context of global distribution ranges. Sight records and information from residents or knowledgeable locals audit such deductions.

There are one habitat types, terrestrial on the study area. The basal cover of the terrestrial habitat is entirely transformed and not suitable for sensitive small mammals such as white-tailed rats. The 500meters of adjoining properties consists of undisturbed grasslands to the south, disturbed grassland and some earthworks to the west, and derelict buildings to the east.

There are furthermore, no caves or structures suitable as daytime roosting sites for cave-dwelling bats.

Observed and expected species richness

Of the 20 small mammal species expected to occur on the study site, only two species were confirmed during the site visit. It should be noted that potential occurrence are interpreted as to be possible over a period of time as a result of expansion and contractions of population densities and ranges which stimulate mitigation.

The low species diversity is due to very low habitat diversity, restricted site size and adjoining areas, and an appalling lack of conservation.

Threatened and Red Listed Mammal Species

No Red Data or sensitive species are deemed present on the study site, either since the site is too disturbed, falls outside the distributional ranges of some species, or does not offer suitable habitats.

The study site has been entirely transformed by intensive farming practices and infrastructures. No natural elements of note remain, The proposed development will therefore not result in a loss of ecological sensitive and important habitat units, ecosystems functions, loss of mammal habitat, nor of threatened or protected species.

Avifauna

Two major bird habitat systems were identified within the Egoli Granite Grassland vegetation type.

- Open Disturbed Grassland

Open natural grassland is found within the Mesic Highveld Grassland Bioregion of the Grassland Biome and more specifically within the Egoli Granite Grassland vegetation type according to Mucina and Rutherford (2006). The landscape consists of moderately undulating plains and low hills supporting tall, usually *Hyparrhenia hirta* dominated grassland with some woody species on rocky outcrops or rock sheets. The presence and abundance of bird species in this habitat will vary from season to season – lush and green in summer after summer rains and dry, brown, frosted or burnt during winter.

- Gardens, transformed areas and mixed alien and indigenous vegetation

Rural and suburban gardens have created an evergreen habitat for many bird species, where birds can hide, breed and forage for food. Natural predators such as snakes and smaller wild-cat species, which are largely persecuted by man, have been driven out of these areas, making it a relatively safe environment for birds apart from domestic cats and dogs. Many bird species have adapted to human-altered areas and these species are mainly the more common bird species found within southern Africa.

Fruit-bearing trees are also an important food supply for many bird species. Most of these bird species are not habitat specific and, due to their high level of adaptability, are also not threatened.

Observed and Expected Species Richness

Of the 359 bird species recorded 89 are likely to occur on site and 28 of these bird species were actually observed on the study area during the site visit. **Refer to Table 1 of Annexure G2**, for the list of Red Data species observed on the study site. The habitat system on the

study site will not favour any of the Red Data avifauna species due to the lack of suitable breeding, roosting and foraging habitat on the study site.

Threatened and Red-listed bird species

Twenty-seven Red Data bird species have been recorded within the 2527DD q.d.g.c. Eight of these have disappeared from the area or have not been recorded for this quarter degree grid cell during the time of the southern African Bird Atlas project. It is unlikely that they will ever recur in this region again, except maybe on rare occasions in protected areas. Eight of these species used to breed within the said q.d.g.c. (Tarboton 1987) and none have been recorded breeding for the q.d.g.c. during the period of the Southern African bird atlas project. All of the Red Data species that have been recorded show a low to very low reporting rate. This decline in breeding species is probably due to the large extent of development that has taken place during a short space of time.

Reptiles and Amphibians

Method

According to Galago the habitat and substrate of this site do not appear to be particularly suitable for reptiles and amphibians. Therefore low species diversity and population densities are expected. However, during the site visit the site was surveyed and assessed for the potential occurrence of Red Data and specially protected species such as:

- Giant Bullfrog (*Phrynosoma macleayi*);
- Striped Harlequin Snake (*Homoroselaps dorsalis*); and
- Southern African Python (*Python natalensis*).

No indigenous trees with bark suitable for arboreal species occurs. The limited water bodies which exist in the area are suitable as habitat for most of the listed amphibians but they are off-site and not suitable for the Giant Bullfrog.

Findings and potential Implications

Mammals: The proposed development will not result in a loss of ecological sensitive and important habitat units, ecosystem function (e.g. reduction in water quality, soil pollution), loss of sensitive faunal habitat, nor of loss/displacement of threatened or protected fauna.

Avifauna: The entire study site is disturbed by past and present human activities as well as human presence on and surrounding the site. Natural areas are small and fragmented and the surrounding areas are increasingly being developed to make room for residential development. This disturbed grassland area will only attract the more common grassland

The Melodius Lark (*Mirafra cheniana*)

The Melodius Lark is listed in the Eskom Red Data Book of birds of South Africa, Lesotho and Swaziland (Barnes 2000) but has been removed from GDARD list of priority species. It appears to be sensitive to overgrazing (Barnes 2000) and land-use changes in the grasslands may severely impact this species (Stattersfield *et al.* 1998)

Reptiles and Amphibians

Parts of the study site are prime agricultural land, which has been utilised for crop production for many years. This activity was detrimental to the herpetofauna and would have reduced the numbers thereof.

However, the stony areas covered with natural grassveld are expected to have more natural populations relative to the habitat type and presently act as population reservoirs. The harder substrate of the rocky ridge along the eastern border does not allow species to proliferate to the same extent and population densities are expected to be lower.

Conclusion and Recommendations made by Galago:

Mammals: Considering the intensity of the proposed development, the mammal assemblage will be displaced, including the Red Data species. The site itself is so small that, at best, it only forms a part of species' home ranges. However, considering the mounting external pressures exerted on the endangered species of the neighbourhood, coupled to a disregard for their conservation welfare, it is submitted that the populations are on the decline on a road of regional extinction.

Birds: Melodious Larks were observed within the open grassland where the proposed development is to be constructed. This open grassland is also suitable habitat for other Red Data Species as listed above. It is recommended that the large open natural grassland area in the middle of the site nearest to the ridge and chert ridge vegetation be left undeveloped and undisturbed.

Reptiles and Amphibians: The local herpetofauna of parts of this site is seriously depleted by long-term agricultural activities. The herpetofauna of the entire site will be more or less annihilated by urban development. Later, commensals such as the Speckled Skink, Cape Dwarf Gecko, the Tropical House Gecko and the Brown House Snake, species which can and will utilise human structures in association with man, will appear in this community.

The following mitigation measures were proposed by the fauna and flora specialists:

- No plants not indigenous to the area, or exotic plant species, especially lawn grasses such as Kikuyu and other ground-covering plants, should be introduced in the landscaping of the proposed site, as they might spread into the areas of natural vegetation;
- The areas earmarked for exclusion from development must be fenced off during the construction phase to ensure that the developer and his contractors do not damage these areas or do not cover them with soil, builders' rubble or waste.

- Entrance by vehicles, especially off-road cars and bakkies, off-road bicycles and quad bikes to the areas to be excluded should be prohibited, both during the construction phase and during the lifespan of the project.
- Forage and host plants required by pollinator species in the area should also be used in landscaped areas.
- All Category 1 Declared Weeds and Category 2 and 3 Declared invaders and other alien species must be removed from the site.
- Should hedgehogs or any other endangered species be encountered during the development, these should be relocated (if possible) to natural grassland areas in the vicinity.
- The contractor must ensure that no fauna species are disturbed, trapped, hunted or killed during the construction phase. Conservation-orientated clauses should be built into contracts for construction personnel, complete with penalty clauses for non-compliance.
- Where possible work should be restricted to one area at a time. This will give the smaller birds, mammals and reptiles a chance to weather the disturbance in an undisturbed zone close to their natural territories.
- During the construction phase noise must be kept to a minimum to reduce the impact of the development on the fauna residing on the site.

The following mitigation measures were developed by GDARD (previously GDACE) (Directorate of Nature Conservation, GDACE, 2008) and are applicable to the study site.

- All areas designated as sensitive in a sensitivity mapping exercise should be incorporated into an open space system and registered against the title deeds as a conservation servitude. Development should be located on the areas of lowest sensitivity.*
- Development structures should be clustered as close as possible to existing development.*

- An independent suitably qualified individual registered in accordance with the Natural Scientific Professions Act (No. 27 of 2003) should act as the environmental control officer.*
- An appropriate management authority (e.g. the body corporate) that is contractually bound to implement the Environmental Management Plan (EMP) and Environmental Authorization (previously known as Record Of Decision (ROD)) during the operational phase of the development should be identified.*
- An ecological management plan for the open space system should be compiled by a specialist registered in accordance with the Natural Scientific Professions Act (No. 27 of 2003) in the fields of Botanical / Ecological / Zoological Science. This ecological management plan should form part of the EMP.*
- The ecological management plan should:
 - include a fire management programme to ensure persistence of grassland*
 - include an ongoing monitoring and eradication programme for all nonindigenous species, with specific emphasis on invasive and weedy species*
 - include a comprehensive surface runoff and storm water management plan, indicating how all surface runoff generated as a result of the development (during both the construction and operational phases) will be managed (e.g. artificial wetlands / storm water and flood retention ponds) prior to entering any natural drainage system or wetland and how surface runoff will be retained outside of any demarcated buffer/flood zones and subsequently released to simulate natural hydrological conditions*
 - ensure the persistence of all Red and Orange List species*
 - include a monitoring programme for all Red and Orange List species*
 - facilitate/augment natural ecological processes*
 - provide for the habitat and life history needs of important pollinators*
 - minimize artificial edge effects (e.g. water runoff from developed areas & application of chemicals)*
 - include a comprehensive plan for limited recreational development (trails, bird hides etc.) within the open space system*




- include management recommendations for neighbouring land, especially where correct management on adjacent land is crucial for the long-term persistence of sensitive species present on the development site*
- result in a report back to the Directorate of Nature Conservation on an annual basis*
- investigate and advise on appropriate legislative tools (e.g. the NEMA: Protected Areas Act 57 of 2003) for formally protecting the area (as well as adjacent land where it is crucial for the long-term persistence of sensitive species present on the development site)*
- A copy of the ecological management plan should be provided to all neighbouring landowners.*
- A funding mechanism that will cover the cost of implementing the ecological management plan should be established.*
- All areas earmarked for development should be fenced off from the open space system prior to construction commencing (including site clearing and pegging). All construction related impacts (including service roads, temporary housing, temporary ablution, disturbance of natural habitat, storing of equipment/building materials/vehicles or any other activity) should be contained within the fenced-off development areas. Access of vehicles to the open space system should be prevented and access of people should be controlled, both during the construction and operational phases. Movement of all indigenous fauna should however be allowed (i.e. no solid walls, e.g. through the erection of palisade fencing), unless otherwise specified in another condition.*
- Compacting of soil should be avoided in areas to be included in the open space system.*
- Connectivity between the open space system and adjacent natural vegetation / open space systems should be ensured.*
- Outside lighting should be designed to minimize impacts on fauna. All outside lighting should be directed away from sensitive areas. Fluorescent and mercury vapour lighting should be avoided and sodium vapour (yellow) lights should be used wherever possible.*

- Only species indigenous to South Africa should be used for landscaping / gardens within 200m of the open space system. Plant species indigenous to the natural vegetation of the area are preferred. As far as possible, plants naturally growing on the development site, but would otherwise be destroyed during clearing for development purposes, should be incorporated into landscaped areas. Forage and host plants required by pollinators should also be planted in landscaped areas.*
- In order to minimize artificially generated surface storm water runoff, total sealing of paved areas such as parking lots, driveways, pavements and walkways should not be permitted. Permeable material should rather be utilized for these purposes.*

6.1.2.a Issues & Impact Identification – Flora and Fauna

Table 25: Issues and Impacts – Flora and Fauna

| | Issue/ Impact | Positive/ Negative/ Neutral ± | Mitigation Possibilities High 🟢 Medium 😊 Low 🟡 Positive Impact - Not Necessary To Mitigate ☀️ |
|-----|---|-------------------------------------|---|
| 15) | The loss of sensitive grassland areas | - | 🔴 |
| 16) | The loss of medicinal plants species. | - | 😊 |
| 17) | The eradication of weeds and exotic invaders. | + | ☀️ |
| 18) | If the entire area to be developed is cleared at once, smaller birds, mammals and reptiles will not be afforded the chance to weather the disturbance in an undisturbed zone close to their | - | 😊 |

| | | | |
|-----|---|---|---|
| | natural territories. | | |
| 19) | Noise of construction machinery could have a negative impact on the fauna species during the construction phase. | - |  |
| 20) | During the construction and operational phase (if not managed correctly) fauna species could be disturbed, trapped, hunted or killed. | - |  |
| 21) | Loss of habitat can lead to the decrease of fauna numbers and species. | - |  |

6.1.2.b Discussion of issues identified, possible mitigation measures and significance of issue after mitigation

15) The loss of Natural Primary Grassland

Themeda triandra grassland will be lost due to the proposed development. According to Galago Environmental the habitat of the *Themeda triandra* grassland was suitable for the Orange-listed *Eucomis autumnalis* subsp *clavata* (Pineapple flower) and *Hypoxis hemerocallidea* (African potato) which were both found in the triangle of grassland between the R21 highway and the cultivated fields in the northern section of the study area. Although the habitat of the *Themeda triandra* grassland was suitable for the one red listed orchid species, **none** were found.

The project team had discussions with Galago Environmental regarding the flora and fauna survey and they agree with the principle of the development of sensitive areas that will eventually become completely isolated and the provision of larger open spaces in areas where links to the larger regional open space system are possible.

In addition it should be noted that the study area was **not** identified as an irreplaceable site according to GIDS and that **no red listed flora species** was found on the site.

Table 26: Significance of Issue 15 (The loss of sensitive grassland areas) After Mitigation/ Addressing of the Issue

| | | |
|--|---|---|
| <p>Mitigation Possibilities</p> <p>High 🟢 Medium 😊 Low 🟡</p> <p>Positive Impact/ Neutral - Not Necessary To Mitigate ☀️</p> | <p>Mitigation</p> <p>Already achieved ✓</p> <p>Must be implemented during planning phase, construction and/ or operational phase</p> <p>P / C / O</p> | <p>Significance of Issue after mitigation</p> <p>Low/ eliminated L / E</p> <p>Medium M</p> <p>High H</p> <p>Not possible to mitigate, but not regarded as a fatal flaw NP</p> |
| <p>Low 🟡</p> | <p>P/C/O – Sensitive grassland areas will be lost, however large continuous open space areas linked to the larger open space system must be provided in the larger Twenty One developments. The layout must be designed accordingly.</p> | <p>H - To be included in EMP</p> |

Result:

The issue cannot be mitigated, but is not regarded as a fatal flaw. The issue should be assessed in the Significance rating table.

16) The loss of medicinal plant species

Some medicinal plant species will be lost due to the proposed development.

Table 27: Significance of Issue 16 (The loss of medicinal plant species) After Mitigation/ Addressing of the Issue

| | | |
|---|---|---|
| <p>Mitigation Possibilities</p> <p>High 🟢 Medium 😊 Low 🟡</p> | <p>Mitigation</p> <p>Already achieved ✓</p> <p>Must be implemented during</p> | <p>Significance of Issue after mitigation</p> <p>Low/ eliminated L / E</p> |
|---|---|---|

| | | |
|---|--|--|
| Positive Impact/ Neutral - Not Necessary To Mitigate ☀ | planning phase, construction and/ or operational phase P / C / O | Medium M High H Not possible to mitigate, but not regarded as a fatal flaw NP |
| Low 🟡 | P – As much as possible of the medicinal plant species should be removed prior to construction and be transplanted in a suitable area by a vegetation specialist. | H -To be included in EMP |

Result:

Although issue can be mitigated, the significance of the impact should still be determined / confirmed assessed in the Significance Rating Table

17) The proposed development will result in the eradication of exotic invaders and weeds.

Category 1 Declared weeds, Category 2 Declared invader and Category 3 Declared invaders occurred on the study area and must be eradicated prior to construction and throughout the operational phase of the development.

Table 28: Significance of Issue 17 (The eradication of invasive species) After Mitigation/ Addressing of the Issue

| | | |
|---|---|--|
| Mitigation Possibilities High 🟢 Medium 🟡 Low 🟠 Positive Impact/ Neutral - Not Necessary To Mitigate ☀ | Mitigation Already achieved ✓ Must be implemented during planning phase, construction and/ or operational phase P / C / O | Significance of Issue after mitigation Low/ eliminated L / E Medium M High H Not possible to mitigate, |
|---|---|--|

| | | |
|--|--|--|
| | | but not regarded as a fatal flaw NP |
| Positive Impact - Not Necessary To Mitigate ✨ | P/C/O –Category 1 Declared weeds, Category 2 Declared invaders and one Category 3 Declared invader occurred on the study area and must be eradicated prior to construction and throughout the operational phase of the development. | M -To be included in EMP |
| | P/C/O – No plants not indigenous to the area, or exotic plant species, especially lawn grasses such as Kikuyu and other ground-covering plants, should be introduced in the communal garden / landscaping of the proposed development, as they might spread into the areas of natural vegetation. | L -To be included in EMP |
| | P/C/O – Forage and host plants required by pollinator species in the area should also be used in landscaped areas. | L -To be included in EMP |

Result:

Positive impact, the significance of the impact should still be determined / confirmed and assessed in the Significance Rating Table.

- 18) If the entire area to be developed is cleared at once, smaller birds, mammals and reptiles will not be afforded the chance to weather the disturbance in an undisturbed zone close to their natural territories.**

Due to the size of the proposed development it is unlikely that the entire area to be developed will be cleared at once.

Table 29: Significance of Issue 18 (If the entire area to be developed is cleared at once, smaller birds, mammals and reptiles will not be afforded the chance to weather the disturbance in an undisturbed zone close to their natural territories) After Mitigation/ Addressing of the Issue.

| | | |
|---|---|---|
| <p>Mitigation Possibilities High 🟢 Medium 😊 Low 🟡 Positive Impact/ Neutral - Not Necessary To Mitigate ✨</p> | <p>Mitigation Already achieved ✓ Must be implemented during planning phase, construction and/ or operational phase P / C / O</p> | <p>Significance of Issue after mitigation Low/ eliminated L / E Medium M High H Not possible to mitigate, but not regarded as a fatal flaw NP</p> |
| <p>Medium 😊</p> | <p>P / C / O - Where possible, work should be restricted to one area at a time.</p> | <p>L -To be included in EMP</p> |

Result:

Although issue can be mitigated, the significance of the impact should still be determined / confirmed assessed in the Significance Rating Table.

19) Noise of construction machinery could have a negative impact on the fauna species during the construction phase.

If not managed correctly, noise pollution (i.e. by machinery without noise muffing devices) could have a negative impact on the surrounding residents and the fauna and birds in the area. This will however only be a short-term impact and it is expected that many of the birds will return to the area during the operational phase.

Table 30: Significance of Issue 19 (Noise of construction machinery could have a negative impact on the fauna species during the construction phase) After Mitigation/ Addressing of the Issue.

| | | |
|---|--|---|
| <p>Mitigation Possibilities</p> <p>High 🟢 Medium 😊 Low 🟡</p> <p>Positive Impact/ Neutral - Not Necessary To Mitigate ☀️</p> | <p>Mitigation</p> <p>Already achieved ✓</p> <p>Must be implemented during planning phase, construction and/ or operational phase</p> <p>P / C / O</p> | <p>Significance of Issue after mitigation</p> <p>Low/ eliminated L / E</p> <p>Medium M</p> <p>High H</p> <p>Not possible to mitigate, but not regarded as a fatal flaw NP</p> |
| <p>High 🟢</p> | <p>P / C - Noise should be kept to a minimum and the development should be done in phases to allow faunal species to temporarily migrate into the conservation areas in the vicinity.</p> | <p>L -To be included in EMP</p> |

Result:

Although issue can be mitigated, the significance of the impact should still be determined / confirmed assessed in the Significance Rating Table.

20) During the construction and operational phase (if not managed correctly) fauna species could be disturbed, trapped, hunted or killed.

There is always a risk that construction personnel or new residents of the development may disturb, trap, hunt or kill fauna on the study area. This will have a detrimental impact on the local biodiversity and will decrease fauna numbers. The issue can be mitigated if this issue is included in conservation-orientated clauses that may be built into contracts of construction personnel and residents and if council prosecute offenders of these actions.

Caught animals should also be relocated to conservation areas in the vicinity.

Table 31: Significance of Issue 20 (During the construction and operational phase (if not managed correctly) fauna species could be disturbed, trapped, hunted or killed) After Mitigation/ Addressing of the Issue

| <p>Mitigation Possibilities</p> <p>High 🟢 Medium 😐 Low 🟡</p> <p>Positive Impact/ Neutral - Not Necessary To Mitigate ⚙️</p> | <p>Mitigation</p> <p>Already achieved ✓</p> <p>Must be implemented during planning phase, construction and/ or operational phase</p> <p>P / C / O</p> | <p>Significance of Issue after mitigation</p> <p>Low/ eliminated L / E Medium M</p> <p>High H</p> <p>Not possible to mitigate, but not regarded as a fatal flaw NP</p> |
|--|--|--|
| <p>High 🟢</p> | <p>C / O - Should hedgehogs be encountered during the construction and operational phase of the development, these should be relocated to natural grassland areas in the vicinity.</p> <p>C / O - should the Harlequin snake be encountered during the construction phase of the development, it must be properly recorded, sent to the Transvaal Museum (if dead) or moved to other areas suitable for its preservation.</p> <p>C / O - The integrity of remaining wildlife should be upheld, and no trapping or hunting by construction personnel should be allowed. Caught animals</p> | <p>L -To be included in EMP</p> |

| | | |
|--|---|--|
| | <p>should be relocated to the conservation areas in the vicinity. Council shall prosecute offenders.</p> <p>P - Conservation-orientated clauses should be built into contracts for construction personnel as well as buyers of property within the new development complete with penalty clauses for non-compliance.</p> <p>P/C – The trenches for the water pipelines and sewage lines should be as narrow as possible. Environmental damage caused by these trenches may be kept to a minimum by good forward planning and thereby reducing the actual length of time that they are open. Possible damage to wildlife is in direct proportion to the time that these trenches are open and may destroy amphibian and reptilian species.</p> | |
|--|---|--|

Result: *Although issue can be mitigated, the significance of the impact should still be determined / confirmed assessed in the Significance Rating Table*

21) Loss of habitat can lead to the decrease of fauna numbers.

All mitigation measures for impacts on the indigenous flora of the area should be implemented in order to limit habitat loss.

Table 32: Significance of Issue 21 (Loss of habitat can lead to the decrease of local fauna numbers and species) After Mitigation/ Addressing of the Issue

| | | |
|---|---|---|
| <p>Mitigation Possibilities High 🟢 Medium 🟡 Low 🔴 Positive Impact/ Neutral - Not Necessary To Mitigate ✨</p> | <p>Mitigation Already achieved ✓ Must be implemented during planning phase, construction and/ or operational phase P / C / O</p> | <p>Significance of Issue after mitigation Low/ eliminated L / E Medium M High H Not possible to mitigate, but not regarded as a fatal flaw NP</p> |
| <p>Medium 🟡</p> | <p>P / C / O – All mitigation measures for impacts on the indigenous flora of the area should be implemented in order to limit habitat loss and maintain and improve available habitat, in order to maintain and possibly increase numbers and species of indigenous fauna. C \ O - Should hedgehogs be encountered during the construction and operational phase of the development, these should be relocated to natural grassland areas in the vicinity.</p> | <p>L - In terms of local fauna population</p> |

Result: *Although issue can be mitigated, the significance of the impact should still be determined / confirmed assessed in the Significance Rating Table*

6.2 DESCRIPTION OF THE EXISTING SOCIO-ECONOMIC ENVIRONMENT

6.2.1 Archaeology/Cultural History

No significant cultural and historical features are expected to occur on the study area. A HIA study is being conducted and will be included as part of the final EIA. It's also required that SAHRA provide comments on the proposed development.

Legal requirements

It should be noted that in terms of the South African Resources Act (Act 25 of 1999) Section 35(4) no person may, without a permit issued by the responsible heritage resources authority destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or material.

Also important is that Section 34(1) of this act states that no person may alter or demolish any structure or part of a structure, which is older than 60 years without a permit, issued by the relevant provincial heritage resources authority.

6.2.1.a Issues & Impact Identification – Cultural and Historical

Table 33: Issues and Impacts – Cultural and Historical

| | Issue/ Impact | Positive/ Negative/ Neutral ± | Mitigation Possibilities High 🟢 Medium 🟡 Low 🔴 Positive Impact - Not Necessary To |
|--|---------------|-------------------------------------|---|
| | | | |

| | | | |
|-----|---|---|-------------------|
| | | | Mitigate ☀ |
| 22) | If any cultural or historical artefacts are found during construction it may be destroyed by construction activities. | - | 😊 |

6.2.1.b Discussion of issues identified, possible mitigation measures and significance of issue after mitigation

22) If any cultural or historical artefacts are found during construction it may be destroyed by construction activities.

Table 34: Significance of Issue 22 (If any cultural or historical artefacts are found during construction it may be destroyed by construction activities.) After Mitigation/ Addressing of the Issue

| | | |
|---|---|---|
| <p>Mitigation Possibilities</p> <p>High 😊 Medium 😊 Low 🟠</p> <p>Positive Impact/ Neutral - Not Necessary To Mitigate ☀</p> | <p>Mitigation</p> <p>Already achieved ✓</p> <p>Must be implemented during planning phase, construction and/ or operational phase</p> <p>P / C / O</p> | <p>Significance of Issue after mitigation</p> <p>Positive ☀</p> <p>Low/ eliminated L / E</p> <p>Medium M</p> <p>High H</p> <p>Not possible to mitigate, but not regarded as a fatal flaw NP</p> |
| <p>High 😊 - In the longer term</p> | <p>P / C / O - It should be noted that in terms of the South African Resources Act (Act 25 of 1999) Section 35(4) no person may, without a permit issued by the responsible heritage resources authority destroy, damage, excavate, alter,</p> | <p>L – To be included in the EMP</p> |

| | | |
|--|---|--|
| | <p>deface or otherwise disturb any archaeological or palaeontological site or material.</p> <p>P/ C/ O - Also important is that Section 34(1) of this act states that no person may alter or demolish any structure or part of a structure, which is older than 60 years without a permit, issued by the relevant provincial heritage resources authority.</p> | |
|--|---|--|

Result: *Although issue can be mitigated, the significance of the impact should still be determined / confirmed assessed in the Significance Rating Table.*

6.2.2 Existing Land Use

6.2.2.1 The Study Area

The site is currently zoned “Undetermined”, in terms of the Peri-Urban Areas Town Planning Scheme, 1975. Other properties in the vicinity are generally zoned “Undetermined”, “Special”, “Private Open Space” and “Industrial 1”. The proposed development is situated on the south eastern corner of the intersection between the K29 (R512) and K33 Provincial Road, between Lanseria Airport and the N14 Highway.

6.2.2.2 Surrounding Development and Land Uses

The study area is currently developed as a chicken farm. There are: vacant land, a school, rural residential dwellings, a construction site office; a construction yard and an informal settlement to the north of the site.

North-east and eastern side of the site are also vacant land. East of the site are vacant land, a spaza shop and a derelict building. To the south of the site are vacant land and an informal settlement.

To the South-west of the site is the Herford Junction Shopping Centre, the Megazone Business Park, Petrol Filling Station and Hertford hotel and wedding venue. To the west of the site are vacant land and a construction site. North-west of the site are vacant land and a construction site. Further to the north of the site is the Lanseria Airport.

6.2.3 The Proposed Land Use

The proposed Lanseria x51 development is for mixed land uses. The proposed rezoning to: "Special", include the following land uses: Residential dwelling units, Hotels, Wholesale/Retail, Warehouses, Workshops, Showrooms, Exhibition and Distribution Centres, Restaurants, Offices, Places of Amusement, Medical Consulting Rooms and Places of Instruction.

6.2.3.1 Proposed Zonings and Land-Use

(Refer to Annexure G3, for the information brochure compiled by Syndev Properties.)

According to the information report the node in Zone 4a will comprise mainly office and retail uses and supporting high density residential development. Zone 4b will be mainly developed for commercial purposes as well as institutional facilities.

As far as permitted floor area the plan envisages surprisingly high densities for a location which many would consider view as being semi-rural. Zone 4a is planned to eventually contain 2million. Storey heights in Zone 4a may go up to 8 storeys and 6 in Zone 4b.

With the expected growth, refer to the table below indicating the growth over 13 years.

Table 35: Land Uses

| | 2007 | 2010 | 2020 |
|----------------------------|-----------------------|-------------------------|-------------------------|
| Commercial and Technology: | 216 000m ² | 1 288 000m ² | 3 876 000m ² |
| Retail | 44 731m ² | 46 786m ² | 60 540m ² |
| Office | 281 806m ² | 294 753m ² | 381 404m ² |
| Light Industrial | 131 200m ² | 224 800 m ² | 436 000m ² |

In summary, there will be a retail growth of only 15 000m², an office floor area growth of 300 00m² between 2007 and 2020. However, by far the fastest growing sector will be Commercial Technology to increase by 400% from 2010 to 2020.

6.2.3.2 Need and Desirability

The site is extremely well suited for mixed used development due to its excellent accessibility, visibility and location within this precinct. This site, being large tract of vacant land on a highly visible and easily accessible route, within the precinct, offers a unique development opportunity for additional mixed use developments within the precinct. The reason for this is that the property, as previously mentioned, is located in a very prominent location within the Lanseria precinct and, in order to maximise the development potential of this property, it is necessary to include a variety of land use configurations on this property.

It could be that because of the prominence of the property and the exposure thereof to the K29 Provincial Road (R512) and K33 Provincial Roads, a part of the rights will be devoted to the development of high density residential accommodation. The growth of the airport will act as a strong catalyst to give impetus to establishment of a metropolitan sized node, supported by local high density residential suburbs. Further high density housing is proposed because at a point where commuting into Johannesburg nodes becomes impractical and residential development in this location would rather favour employment nodes surrounding the Lanseria Airport and the Node in general.

The site, being on a highly visible and easily accessible route, within the node, offers a unique development opportunity for residential developments within the node. The township will cater for accommodation needs that may arise as a result of the proximity of the Lanseria Airport, the growth of the Node or the proximity to major roads. The site is extremely well suited for high density residential use. Lanseria nodal area is strategically located and will be a significant employment node. As a result, many employees may wish to reside in close proximity to this node.

Due to the exposure of the site to an arterial transportation axis, such as the K29 and K33 Provincial Roads and N14 Freeway, also creates opportunity for high density residential accommodation to be developed on the property. Uses such as this need to be more accessible. The site complies with these requirements and therefore, such rights have been included to form part off the zoning definition. A component of the proposed development would also be devoted to the development of retail and, mainly as a result of the extent of the proposed development, where retail could take the form of a regional shopping centre.

The site is located in the most advantageous location with regard to the ire of the node and with regard to exceptional visibility from the major surrounding Provincial Roads. Due to this location and provincial Roads visibility is most likely that regional and national retailers would seek to locate in this. The regional shopping mall concept has been successfully established in South Africa. Within the vicinity of the application site no such facility exists while industrial and residential developments have been established or are in

the process of being established in the application area.

The total impact of a regional shopping centre is far greater than the direct, foreseeable ones. As a result shopping mall developments have dramatic community impacts and create continuing employment opportunities. The creation of job opportunities within reach of residential areas has been identified as a priority in all guiding policies and legislation. The introduction of the regional Shopping Centre facility will bring the area in line with other competing mixed used areas as assist in strengthening the area and making it attractive for entrepreneurs, residents and workers alike. It will also assist with providing a more acceptable living working environment, in line with objectives of the RSDF.

This site is also extremely well suited for office uses due to its excellent accessibility, visibility and location within this proposed regional node. Due to the locality of the Lanseria Node, office use will be desirable and appropriate. To provide the full compliment of services, it will also be necessary to make provision for entertainment. These facilities can be patronised by the Airport's employees and visitors to the residents, workers and visitors to the Airport as well as the residents in the surrounding areas.

Medical facilities would be an appropriate use within this area and would result in a well-balanced and sustainable community, where all the needs of the residents, workers and visitors can be met. The site is well suited to be used as a medical facility and it is going to be surrounded by high density residential suburbs. Since Riverfield is the nearest medical facility to the site at present it would only be appropriate to develop a medical facility closer to the airport.

The proposed development will, therefore, be constructed as a true mixed land use facility, which land uses would compliment the Lanseria Airport and surrounding areas and would make it possible to develop the site to its fullest potential in terms of Council policy. It is in light of the aforementioned, that this application is submitted, in order to increase the development potential of the site in response to the surrounding existing and proposed developments and to further the vision of existing Council policies.

6.2.3.a Issues & Impact Identification – Proposed Land-Use

Table 36: Issues and Impacts – Proposed Land-Use

| | Issue/ Impact | Positive/ Negative/ Neutral ± | Mitigation Possibilities High ☺ Medium ☹ Low ☒ Positive Impact - Not Necessary To Mitigate ☼ |
|-----|--|-------------------------------------|--|
| 23) | Upgrading of municipal services | + | ☼ |
| 24) | Upgrading of provincial and local roads | + | ☼ |
| 25) | Economical injection to local businesses | + | ☼ |
| 26) | Creation of temporary and permanent jobs | + | ☼ |
| 27) | Increase in adjacent land-values | + | ☼ |
| 28) | Rates and taxes payable to the local authority | + | ☼ |
| 29) | The supply of much needed housing in close proximity to employment opportunities | + | ☼ |
| 30) | Possibility of illegal settlements and increased security problems | - | ☺ |
| 31) | Traffic increase in the area, will have an impact on the traffic flow. | - | ☹ |
| 32) | Damage to the existing services and infrastructure during the construction phase and disruptions in services (i.e. electricity, water, damage to Telkom cables) during the construction phase. | - | ☺ |







| | | | |
|-----|-----------------------|---|---|
| 33) | Dangerous excavations | - |  |
|-----|-----------------------|---|---|

6.2.3.b Discussion of issues identified, possible mitigation measures and significance of issue after mitigation

26) Creation of temporary and permanent jobs

The development will create temporary job opportunities during the construction phase and temporary and permanent job opportunities during the operational phase. Should local communities not benefit from these opportunities, it could lead to an influx of people from other areas. Only employing people from the local community could mitigate the potential adverse impact.

Table 37: Significance of Issue 26 (Creation of temporary and permanent jobs) After Mitigation/ Addressing of the Issue

| | | |
|--|--|---|
| <p>Mitigation Possibilities</p> <p>High  Medium  Low </p> <p>Positive Impact/ Neutral - Not Necessary To Mitigate </p> | <p>Mitigation</p> <p>Already achieved </p> <p>Must be implemented during planning phase, construction and/ or operational phase</p> <p>P / C / O</p> | <p>Significance of Issue after mitigation</p> <p>Low/ eliminated L / E</p> <p>Medium M</p> <p>High H</p> <p>Not possible to mitigate, but not regarded as a fatal flaw NP</p> |
| <p>High </p> | <p>C / O – In order to limit the influx of people from other areas, it is recommended that (where possible) only people from the local communities are employed.</p> | <p>L – To be included in the EMP</p> |

Result: *Although issue can be mitigated, the significance of the impact should still be determined / confirmed assessed in the Significance Rating Table.*

30) Possibility of illegal settlements and increased security problems in the area mainly associated with the construction phase. During the construction phase, the possibility always exists of illegal settlements being established on and around the study area. This causes a security risk to residents on the surrounding properties in the form of possible theft and other crime related activities.

Table 38: Significance of Issue 30 (Possibility of illegal settlements and increased security problems) After Mitigation/Addressing of the Issue.

| Mitigation Possibilities High 🟢 Medium 🟡 Low 🟠 Positive Impact/ Neutral - Not Necessary To Mitigate ✨ | Mitigation Already achieved ✓ Must be implemented during planning phase, construction and/ or operational phase P / C / O | Significance of Issue after mitigation Low/ eliminated L / E Medium M High H Not possible to mitigate, but not regarded as a fatal flaw NP |
|--|---|--|
| High 🟢 | C - With the exception of the appointed security personnel, no other workers, friend or relatives will be allowed to sleep on the construction site (weekends included) C - Presence of law enforcement officials at strategic places must be ensured. | L - To be included in the EMP L - To be included in the EMP |

Result: *Although issue can be mitigated, the significance of the impact should still be determined / confirmed assessed in the Significance Rating Table.*

31) Traffic increase during the construction and operational phases of the development will have an impact on traffic flow and the tranquillity of the area. The impact of additional

traffic during the construction phase, especially heavy construction vehicles that can slow traffic down, can be mitigated to a certain extent by not allowing construction vehicles to use public roads during peak traffic times, as well as to avoid construction activities on public roads during peak traffic times.

Table 39: Significance of Issue 31 (Traffic increase in the area, will have an impact on the traffic flow and the tranquility of the area) After Mitigation/ Addressing of the Issue

| Mitigation Possibilities | Mitigation | Significance of Issue after mitigation |
|---|--|--|
| High 🟢 Medium 🟡 Low 🟠 Positive Impact/ Neutral - Not Necessary To Mitigate ✨ | Already achieved ✓ Must be implemented during planning phase, construction and/ or operational phase P / C / O | Low/ eliminated L / E Medium M High H Not possible to mitigate, but not regarded as a fatal flaw NP |
| Medium 🟡 | P / C - Construction vehicles and activities to avoid peak hour traffic times. P / C - The recommended road upgrades should be implemented. | M – To be included in the EMP |

Result: Although issue can be mitigated, the significance of the impact should still be determined / confirmed assessed in the Significance Rating Table.

32) Construction of the new development may cause damage to the existing services and infrastructure and will disrupt service provision (i.e. electricity, water, Telkom cables) to local residents on surrounding properties during the construction phase.

Table 40: Significance of Issue 32 (Damage to existing services) After Mitigation/ Addressing of the Issue

| | | |
|---|--|--|
| <p>Mitigation Possibilities</p> <p>High 🟢 Medium 🟡 Low 🔴</p> <p>Positive Impact/ Neutral - Not Necessary To Mitigate ⚡</p> | <p>Mitigation</p> <p>Already achieved ✓</p> <p>Must be implemented during planning phase, construction and/ or operational phase</p> <p>P / C / O</p> | <p>Significance of Issue after mitigation:</p> <p>Low/ eliminated L / E</p> <p>Medium M</p> <p>High H</p> <p>Not possible to mitigate, but not regarded as a fatal flaw NP</p> |
| <p>High 🟢</p> | <p>P / C – Determine areas where services will be upgraded and relocated well in advance.</p> <p>Discuss possible disruptions with affected parties to determine most convenient times for service disruptions and warn affected parties well in advance of dates that service disruptions will take place.</p> | <p>M – To be included in the EMP</p> |

Result: *Although issue can be mitigated, the significance of the impact should still be determined / confirmed assessed in the Significance Rating Table*

33) Dangerous excavations could pose a safety risk to surrounding residents, pedestrians and construction workers.

Table 41: Significance of Issue 33 (Dangerous excavations) After Mitigation/ Addressing of the Issue

| | | |
|---|--|--|
| <p>Mitigation Possibilities</p> <p>High 🟢 Medium 🟡 Low 🔴</p> <p>Positive Impact/ Neutral - Not Necessary To Mitigate ⚡</p> | <p>Mitigation</p> <p>Already achieved ✓</p> <p>Must be implemented during planning phase, construction and/ or operational phase</p> <p>P / C / O</p> | <p>Significance of Issue after mitigation</p> <p>Low/ eliminated L / E</p> <p>Medium M</p> <p>High H</p> <p>Not possible to mitigate,</p> |
|---|--|--|

| | | |
|---------------|--|--|
| | | but not regarded as a fatal flaw NP |
| High 🟢 | P/ C - Although regarded as a normal practice, it is important to erect proper signs indicating the danger of the excavation in and around the development site. Putting temporary fencing around excavations where possible. | M – To be included in the EMP |

Result: *Although issue can be mitigated, the significance of the impact should still be determined / confirmed assessed in the Significance Rating Table*

6.2.4 Institutional Environment

The site falls within the jurisdiction of the Johannesburg Metropolitan Municipality, Gauteng Province. The Lanseria airport lies in close proximity to the site. The airport provides access on an international level to the economic heart of South Africa in Gauteng.

11.5 Relevant Conventions to which South Africa is a party:

A: International Conventions:

- **Convention relative to the Preservation of Fauna and Flora** in their natural state, 8 November 1993 (London);
- **Convention on Biological Diversity**, 1995;
(This convention provided and added stimulus for a re-examining and harmonization of its activities relating to biodiversity conservation. This convention also allows for the in-situ and ex-situ propagation of gene material);

- **Agenda 21** adopted at the United Nations Conference on Environment and Development (UNCED) in 1992. (An action plan and blueprint for sustainable development.)

B: National Legislation:

(i) The National Environmental Management Act; 1998 (Act 107 of 1998)

In terms of Government Notices no. R544, R545 and R546 published in the Government Gazette no. 33306 of 18 June 2010 of the National Environment Management Act, 1998 (Act No. 107 of 1998) an Environmental Impact Assessment Process is required for the proposed development. This act addresses issues relating to environmental administration and it promotes sustainable development.

Authorities have to take the principles of NEMA into consideration when evaluating an environmental report/ document, as the authority can be held responsible for any damage to the environment (including social, ecological and economical aspects).

(ii) The National Water Act, 1998 (Act No: 36 of 1998)

The purpose of this Act is to ensure that the nation's water resources are protected, used, developed, conserved, managed and controlled in ways that (amongst other factors), take the following into account:

- Meeting the basic human needs of present and future generations;
- Promoting equitable access to water;
- Promoting the 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; and
- Providing for the growing demand for water use.

In terms of the Section 21 of the National Water Act, the developer must obtain water use licenses if the following activities are taking place:

- a) Taking water from a water resource;
- b) Storing water;
- c) Impeding or diverting the flow of water in a watercourse;
- d) Engaging in a stream flow reduction activity contemplated in section 36;
- e) Engaging in a controlled activity identified as such in section 37(1) or declared under section 38(1);
- f) Discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit;
- g) Disposing of waste in a manner which may detrimentally impact on a water resource;
- h) Disposing in any manner of water which contains waste from or which has been heated in any industrial or power generation process;
- i) Altering the bed, banks, course or characteristics of a water course;
- j) Removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people; and
- k) Using water for recreational purposes.

No, Section 21 water use licenses are required for the proposed township.

(iii) National Environmental Management: Air Quality (Act No. 39 of 2004)

This act replaced the Atmospheric Pollution Prevention Act (Act No. 45 of 1965); however Part 2 of the abovementioned act is still applicable. Part 2 deals with the control of noxious or offensive gases and has no relevance to the proposed development.

The purpose of the Act, (Act No. 39 of 2004), is: "To reform the law regulating air quality in order to protect the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecological sustainable development while promoting justifiable economic and social development; to provide for

national norms and standards regulating air quality monitoring, management and control by all spheres of government; for specific air quality measures; and for matters incident thereto".

(iv) National Heritage Resources, 1999 (Act No 25 of 1999)

The National Heritage Resources Act legislates the necessity for cultural and heritage impact assessment in areas earmarked for development, which exceed 0.5 ha. The Act makes provision for the potential destruction of existing sites, pending the archaeologist's recommendations through permitting procedures. Permits are administered by the South African Resources Agency (SAHRA).

It is important to note that in terms of the National Heritage Resources Act, (Act No 25 of 1999); all historical sites and materials older than 50 years are protected. It is an offence to destroy, damage, alter or remove such objects from the original site, or excavate any such site(s) or material without a permit from the National Monuments Council. Gravesites are subject to the requirements of the National Monuments Act, No. 28 of 1969.

No Archaeological artifacts have been identified on the study area.

(v) National Environmental Management: Biodiversity Act, 2004 (Act No 10 of 2004)

The purpose of the Biodiversity Act is to provide for the management and conservation of South Africa's biodiversity within the framework of the NEMA and the protection of species and ecosystems that warrant national protection. As part of its implementation strategy, the National Spatial Biodiversity Assessment was developed. Specialist ecological assessment studies must be conducted for the study area.

(vi) National Spatial Biodiversity Assessment

The National Spatial biodiversity Assessment (NSBA) classifies areas worthy of protection based on its biophysical characteristics, which are ranked according to priority levels.

(vii) National Environmental Management: Protected Areas Act, 2003 (Act No 57 of 2003)

The purpose of this Act is to provide the protection, conservation and management of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes.

(viii) The Development Facilitation Act, 1995 (Act 67 of 1995)

This Act formulates a set of general principles to serve as guidelines for land development inter alia revolving around:

- The promotion of integration of the social, economic, institutional and physical aspects of land development;
- The promotion of integrated land development in rural and urban areas in support of each other;
- The promotions of the availability of residential land and employment opportunities in close proximity to or integrated with each other;
- The promotion of a combination of diverse land-uses, with each proposed land development area to be judged on its own merit and no specific use, whether residential, commercial, conservation etc., to be regarded as less important;
- Discouraging urban sprawl to promote more compact towns/ cities;
- Encouraging environmentally sound land development practices; and
- Promoting sustained protection of the environment.

Principles contained in NEMA and the DFA

Principles of NEMA and the formally DFA now known as SPLUMA, which give effect to sustainable development, were followed:

- Development must be socially, environmentally and economically sustainable;
- Promotion of integrated land development in rural and urban areas in support of each other;

C: Local legislation

Planning Responsibilities of the Involved Local Authority

The prerogative to plan a development within its jurisdictional area has been, in terms of the Local Government Transitional Act, 1993 and recently the Municipal Systems Act, 2000, vested in the local authority involved.

In order to ensure that the proposed developments comply with the standards and requirements of the involved local authority (City of Johannesburg Metropolitan Municipality), the relevant officials were involved in the planning of the project from the start.

- **Gauteng Urban Edge**

The GSDF proposed the establishment of a provincial Urban Edge to serve as a mechanism towards ensuring the containment and redirection of urban growth, while addressing rural development beyond the Urban Edge.

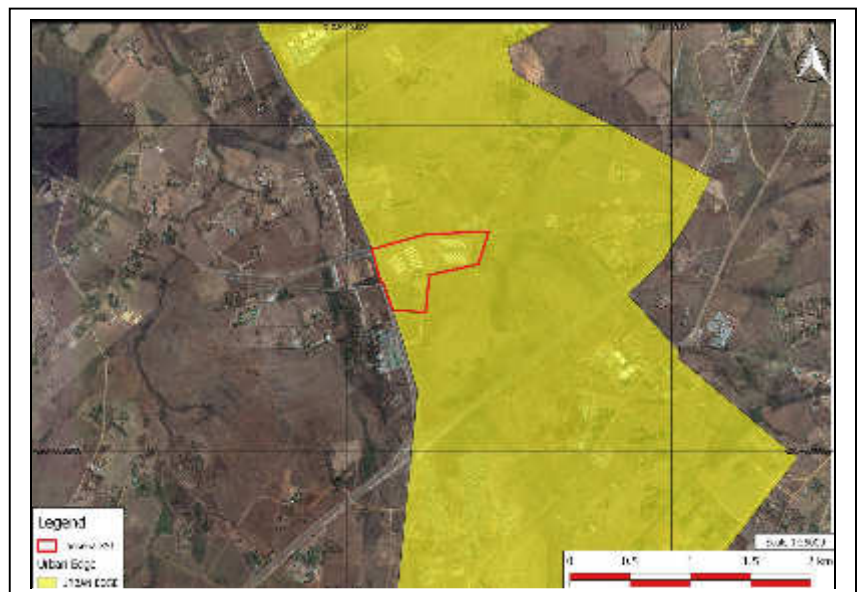


Figure 3: Gauteng Provincial Urban Edge Delineation, 2010

According to Mr. Neels Du Toit of the Department of Local Government and Housing now have a different approach with regards to the delineation of the Urban Edge. The urban edge is now revised on a yearly basis and areas that can be serviced with municipal services can now be included into the urban edge by provincial and local government. The study area falls under the Gauteng Urban Edge, 2010. **(Refer to Figure 3.)**

- **Lanseria Development Framework (City of Johannesburg)**

The proposed density for the development complies with the Regional Spatial Development Plan for the area. The study area falls within Sub-area 1 of the RSDf for Region A and the objectives of this sub-area is to “promote the development of a sound spatial structure to increase the efficiency of the urban system” and to “stimulate the economic development potential of Sub Area 1”. In terms of the RSDf development applications are to be assessed in accordance with the Lanseria Development Framework 2020, which must be read in conjunction with the Growth Management Strategy (GMS). The intervention for objective 1 is: “to encourage mixed land uses that complement one another, as per the land management zone”. One of the guidelines for objective 1 is: that Land Use Management Standards, as contained in the Land Use Management Schedule, must apply.

In terms of the Kya Sand and Lanseria Development Framework the site falls within the Metropolitan mixed-use nodal periphery

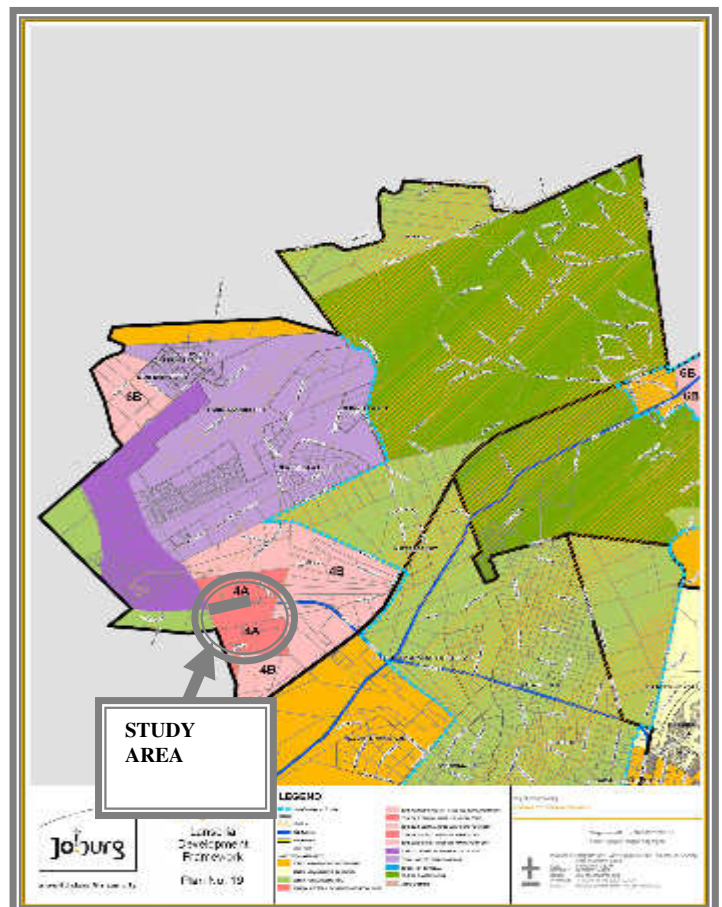


Figure 10: Lanseria Development Framework Map

(Zone 4A); Refer to Figure 11. According to the Land Use Management Schedule in the Framework the node will support high density residential units, hotels, educational, medical and social facilities, retail, office, entertainment and motor trade businesses, municipal and government institutions and commercial industrial land uses. Guidelines for objective 1 also state that community facilities such as religious buildings, medical suites, places of instruction and other related uses suitable in core residential areas can be allowed. According to the GMS the site falls inside the expansion areas. Lanseria remains a highly sought after location because of its accessibility to higher order roads and its close proximity to the Lanseria Airport. The application is thus in accordance with the aims and guidelines of the RSDF.

- **Gauteng Transport Infrastructure Act, 2001 (Act No 8, 2001)**

The purpose of this Act is to consolidate the laws relating to roads and other types of transport infrastructure in Gauteng. It provides for the planning, design, development, construction, financing, management, control, maintenance, protection and rehabilitation of provincial roads, railway lines and other transport infrastructure in Gauteng.

According to this provincial act, the proposed alignments for the Gautrans roads on the Gautrans Grid Road Network Map must be honoured by planners.

This Act is relevant to the proposed development.

- **Municipality Systems Act – No. 32 of 2000**

This Act clearly establishes the Integrated Development Plan and Integrated Spatial Development Framework as guidelines that inform development and processes in this regard.

- **GDARD Draft Ridges Policy**

According to the GDARD C-Plan, the study area is not affected by ridges and the Draft Ridges Policy is therefore not applicable.

- **Draft Policy on the Protection of Agricultural Land (2006)**

The study area does not lie within an Agricultural Hub that was identified by GDARD in 2006. The Draft policy on the protection of Agricultural Land (2006) is therefore not applicable to the proposed development.

6.2.3.a Issues & Impact Identification – Institutional

Table 42: Issues and Impacts – Institutional

| | Issue/ Impact | Positive/ Negative/ Neutral ± | Mitigation Possibilities High 🟢 Medium 🟡 Low 🔴 Positive Impact - Not Necessary To Mitigate ☀️ |
|-----|---|-------------------------------------|---|
| 34) | The proposed development will be in line with the international, national, provincial and local legislation, planning frameworks, guidelines, policies etc. | + | ☀️ |

When looking at the institutional environment, it is important that legislation relevant to all environments (economical, ecological and social) be taken into consideration.

- From a social and economical point of view the study area is ideally situated for a mixed use development in line with the land-uses of the surrounding environment. A lot of legislation documents, development frameworks, the IDP and policies promote development on and around the study area.

6.2.5 Qualitative Environment

6.2.5.1 Visual Impact

The following visual assessment criteria have been used to determine the impact of the proposed Lanseria x 51 on the state of the environment – the significance is indicated by the respective colour coding for each of the impacts, being high, medium and low:

Table 43: Visual Impact Criteria

| CRITERIA | IMPACT | | |
|--|---|---|---|
| | HIGH | MEDIUM | LOW |
| Visibility | A prominent place with an almost tangible theme or ambience | A place with a loosely defined theme or ambience | A place having little or no ambience with which it can be associated |
| Visual quality | A very attractive setting with great variation and interest – no clutter | A setting with some visual and aesthetic merit | A setting with no or little aesthetic value |
| Compatibility with the surrounding landscape | Cannot accommodate proposed development without the development appearing totally out of place – not compatible with the existing theme | Can accommodate the proposed development without it looking completely out of place | The surrounding environment will ideally suit or match the proposed development |
| Character | The site or surrounding area | The site or surrounding | The site or surrounding |

| | | | |
|----------------------------|---|---|---|
| | has a definite character / sense of place | environment has some character | environment exhibits little or no character/ sense of place |
| Visual Absorption Capacity | The ability of the landscape not to accept a proposed development because of a uniform texture, flat slope and limited vegetation cover | The ability of the landscape to less easily accept visually a particular type of development because of less diverse landform, vegetation and texture | The ability of the landscape to easily accept visually a particular type of development because of its diverse landform, vegetation and texture |
| View distance | If uninterrupted view distances to the site are > 5 km | If uninterrupted view distances to the site are < 5 km but > 1 km | If uninterrupted view distances to the site are > 500 m and < 1000 m |
| Critical Views | Views of the site seen by people from sensitive view sheds i.e. farms, nature areas, hiking trails etc. | Some views of the site from sensitive view sheds | Limited or partial views of the site from sensitive view sheds |
| Scale | A landscape with horizontal and vertical elements in high contrast to human scale | A landscape with some horizontal and vertical elements in some contrast to human scale | Where vertical variation is limited and most elements are related to the human and horizontal scale |

The architectural styles, colours, textures and construction materials will determine the visual impact of the proposed development on the surrounding areas.

Architectural guidelines to minimize the visual impact:

- The proposed development will be seen from a distance and therefore the roofs should not reflect the sun or be covered with roofing materials that have bright colours. Black or charcoal coloured roofs will blend in tastefully with the surrounding environment.

- The colour scheme should be taken from the palette of colours in the natural surroundings.
- Existing trees should be retained as far as possible. The trees will soften the impact of the proposed permanent structures and they will bring the scale of the structures within the urban context down to a more human scale.

Landscaping should be done in concurrence with the building construction in order to create an instant visual enhancement of the development.

The landscaping of the proposed development should blend in with the natural vegetation that occurs on site and in the area. Trees, shrubs and groundcovers that are endemic to the area and/or indigenous should preferably be used – landscaping that is in line with the natural vegetation of the area will not only help to reduce the visual impact of the development, but it will also create habitats for fauna and flora species.

From the preliminary visual assessment (**Refer to Figure 11**) it is evident that the study area is completely visible from the north and south, partially visible from the east and west of the side and not very visible from the south-west and north-west.

Due to the location of the study area close to the R21 Freeway the proposed development could have a significant visual impact if it is not planned correctly. It could also have a positive impact if the development is well planned and integrated with the natural surroundings.

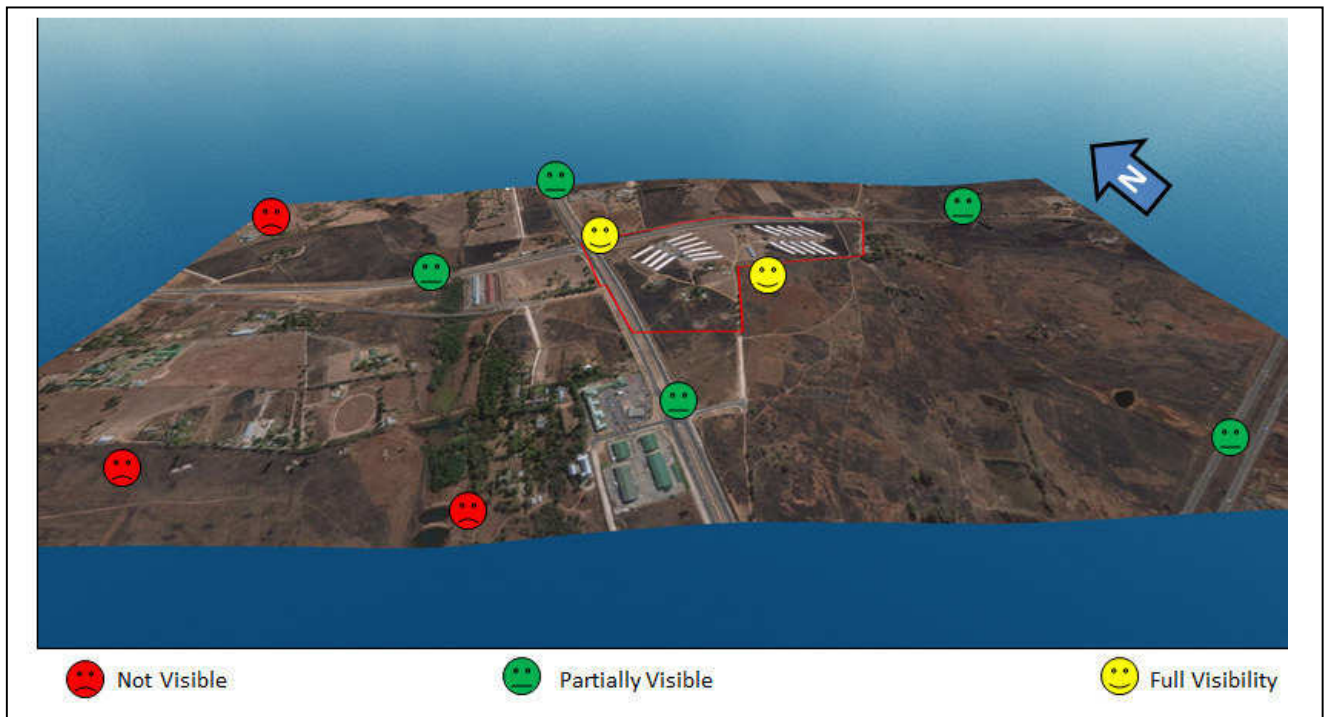


Figure 11: Visual Impact Assessment

6.2.5.2 Sense of Place

The concept of "Sense of Place" does not equate simply to the creation of picturesque landscapes or pretty buildings, but to recognise the importance of a sense of belonging. Embracing uniqueness as opposed to standardisation attains quality of place. In terms of the natural environment it requires the identification and the emphasis of the distinguishing features and characteristics of a landscape, which people respond to. Different natural landscapes suggest different responses. Accordingly, settlement design should respond to nature.

In terms of the human made environment, quality of place recognises that there are points where elements of settlement structure, particularly the movement system, come together to create places of high accessibility and special significance. These are the meetings places of townships e.g. parks. The importance of these places must be recognized and

become the focus of public investment, aimed at making them attractive, user-friendly and comfortable to experience.

The landscape is usually experienced in a sensory, psychological and sequential sense, in order to form an image of place (“genius loci”) of that landscape. A landscape is thus an integrated set of elements, which respond to different influences and is experienced as the unique spirit of place, or “genius loci”. Each landscape has a distinct character, which makes an impression on the mind, an image that endures long after the eyes have moved to other settings. **Sense of place is the subjective feeling a person gets about a place by experiencing the place visually, physically, socially and emotionally. The “Sense of Place” of an area is one of the major contributors to the “Image of the area”.**

The image of an area consists of two main components, namely **place structure** and **sense of place**. These could be defined as the following:

- **Place Structure** refers to the arrangement of physical place making elements within a unique structure that can be easily legible and remembered.
- The **Sense of Place** is the subjective meaning attached to a certain area by individuals or groups and is linked to its history, culture, activities, ambience and the emotions the place creates.

If planned and managed correctly, the proposed development could have a positive impact on the “Sense of Place” of the study area and its surroundings.

The main “Sense of Place” creators are the Ridges (views experienced towards and from ridges), the existing rural atmosphere, the area adjacent to the river and the cultural & historical features on and around the study area.

6.2.5.3 Noise Impact

The construction phase could have a noise impact on the surrounding residents. The existing R21 Freeway close to the proposed site could have noise impacts on residential erven adjacent to these roads.

The following represent a summary of the mitigation measures to be implemented during the construction and operational phase to reduce the anticipated impact of noise pollution. **Refer to Annexure H for the EMP.**

Mitigation measures for the anticipated noise impact during the construction phase:

- The construction site yard, workshop, concrete batching plant and other noisy fixed facilities should be located well away from noise sensitive areas;
- All construction vehicles, plant and equipment are to be kept in good repair;
- Truck traffic should be routed away from noise sensitive areas where possible;
- Blasting Operations (if required) are to be strictly controlled with regard to the size of explosive charge in order to minimise noise and air blast, and timing of explosions;
- Construction activities are to be contained to reasonable hours during the day and early evenings. Night-time activities near noise sensitive areas should not be allowed. No construction should be allowed on weekends from 14h00 on Saturday afternoons to 06h00 the following Monday morning;
- With regard to unavoidable very noisy construction activities in the vicinity of noise sensitive areas, the contractor should liaise with local residents on how best to minimise impact, and the local population should be kept informed of the nature and duration of intended activities;
- As construction workers operated in a very noisy environment, it must be ensured that their working conditions comply with the requirements of the Occupational Health and Safety Act (Act No 85 of 1993) and Gauteng Noise Control Regulations, 1999. Where necessary ear protection gear should be worn.

Mitigation measures for the anticipated noise impact during the operational phase of the proposed development

The following noise specific mitigation measures will need to be considered:

- The design, placement and orientation of the extractor fans for the ventilation of the buildings must take the noise impact aspect into consideration. Equipment with the best noise rating must be used. Roof mounted fans may further require attenuators and need to be screened from noise sensitive areas;
- High quality air-conditioning equipment should be installed. Equipment with the best noise rating should be used;
- Where required, high quality refrigeration compressors should be installed. Equipment with the best noise rating should be used. Exterior building installations should be acoustically encapsulated;
- All mechanical equipment is to be well maintained;
- The delivery times for trucks should be limited to the hours of between 07h00 and 20h00 on weekdays and between 08h00 and 14h00 on Saturdays (only if applicable)
- The noise levels must comply with the Gauteng Noise Control Regulations, 1999

6.2.5.4 Light Pollution

Street and security lighting must be designed in order not to spread light into the eyes of oncoming traffic on existing R21 Freeway. Internal streets and security lighting should also be designed not to disturb residents at night. Light beams must face downwards and not higher than a 45 degree angle from the ground. **Refer to Annexure H for the EMP.**

6.2.5.5 Air Quality / Dust

Some dust pollution may occur during the construction phase if dry and windy conditions occur, but will only be temporary and will not occur during the operational phase. Dust suppression techniques such as sprinkling the construction site regularly with water and by putting up dust nets will mitigate this impact to an acceptable level. **Refer to Annexure H for the EMP.**

6.2.5.a Issues & Impact Identification – Qualitative Environment

Table 44: Issues and Impacts – Qualitative Environment

| | Issue/ Impact | Positive/ Negative/ Neutral ± | Mitigation Possibilities High 🟢 Medium 🟡 Low 🔴 Positive Impact - Not Necessary To Mitigate 🌟 |
|-----|---|-------------------------------------|---|
| 12) | If not planned correctly, roofs and parking areas could reflect the sun into the eyes of oncoming traffic and surrounding landowners - Please refer to Section 6.1.1.3 | | |
| 13) | If not planned and managed correctly the lights (interior and exterior) and the signage of the development could cause visual pollution - Please refer to Section- 6.1.1.3 | | |
| 35) | Construction works cause visual pollution during the construction phase | - | 🟡 |
| 36) | If not planned and managed correctly, the proposed development could have a negative impact on the “Sense of Place” of the study | - | 🟢 |

| | | | |
|-----|---|---|---|
| | area and its surroundings. | | |
| 14) | If dry and windy conditions occur during the construction phase, dust pollution could become a problem - Please refer to Section 6.1.1.4 | - | 😊 |
| 48) | The construction phase of the development could have a noise impact on the surrounding residents | - | 😬 |

6.2.5.b Discussion of issues identified, possible mitigation measures and significance of issue after mitigation

35) Construction works cause visual pollution during the construction phase.

Table 45: Significance of Issue 35 (Visual Pollution during construction phase) After Mitigation/ Addressing of the Issue

| Mitigation Possibilities | Mitigation | Significance of Issue after mitigation |
|--|---|--|
| High 😊 Medium 😬 Low 🟡 Positive Impact/ Neutral - Not Necessary To Mitigate ☀️ | Mitigation Already achieved ✓ Must be implemented during planning phase, construction and/ or operational phase P/ C / O | Low/ eliminated L / E Medium M High H Not possible to mitigate, but not regarded as a fatal flaw NP |
| High 😬 | P/ C -All equipment and materials should be stored in a designated area indicated by the ECO. C - All areas must be kept | M - To be included in the EMP |

| | | |
|--|--|--------------------------------------|
| | neat and tidy and no waste should also be stored in the designated areas and removed on a weekly basis | M – To be included in the EMP |
|--|--|--------------------------------------|

Result: Although issue can be mitigated, the significance of the impact should still be determined / confirmed assessed in the Significance Rating Table

36) The study area does not have a unique “Sense of Place” due to the locality

Table 46: Significance of Issue 36 (If not planned and managed correctly, the proposed development could have a negative impact on the “Sense of Place” of the study area and its surroundings) After Mitigation/ Addressing of the Issue

| Mitigation Possibilities High 😊 Medium 😊 Low 🟡 Positive Impact/ Neutral - Not Necessary To Mitigate ✨ | Mitigation | Significance of Issue after mitigation |
|--|---|--|
| High 😊 | P - Building material and finishes should preferably consist of raw materials and earthy colours should be used; P/C/O - If planned and managed correctly, the proposed development will | E – To be included in the EMP |
| | Already achieved ✓ Must be implemented during planning phase, construction and/ or operational phase P / C / O | Low/ eliminated L / E Medium M High H Not possible to mitigate, but not regarded as a fatal flaw NP |

| | | |
|--|---|--|
| | <p>enhance the “Sense of Place” and value of the study area and its surroundings.</p> | |
|--|---|--|

Result: The issue is eliminated by implementing the mitigation measures and can also be turned into a positive impact. The significance of this positive impact still need be determined confirmed/assessed in the significance rating table.

Table 47: Significance of Issue 48 (The construction and operational phase of the proposed development could have a noise impact on the surrounding residents) After Mitigation/ Addressing of the Issue

| | | |
|---|---|---|
| <p>Mitigation Possibilities</p> <p>High 🟢 Medium 🟡 Low 🔴</p> <p>Positive Impact/ Neutral - Not Necessary To Mitigate ⚡</p> | <p>Mitigation</p> <p>Already achieved ✓</p> <p>Must be implemented during planning phase, construction and/ or operational phase</p> <p>P / C / O</p> | <p>Significance of Issue after mitigation</p> <p>Low/ eliminated L / E</p> <p>Medium M</p> <p>High H</p> <p>Not possible to mitigate, but not regarded as a fatal flaw NP</p> |
| <p>High 🟢</p> | <p>C -</p> <ul style="list-style-type: none"> - The construction site yard, workshop, concrete batching plant and other noisy fixed facilities should be located well away from noise sensitive areas; - All construction vehicles, plant and equipment are to be kept in good repair; - Truck traffic should be routed away from noise sensitive areas where possible; <p>Blasting Operations (if required) are to be strictly controlled with regard to the size of explosive charge in order to minimise</p> | <p>M – To be included in the EMP</p> |

| | | |
|--|---|---|
| | <p>noise and air blast, and timing of explosions;</p> <ul style="list-style-type: none"> - Construction activities are to be contained to reasonable hours during the day and early evenings. Night-time activities near noise sensitive areas should not be allowed. No construction should be allowed on weekends from 14h00 on Saturday afternoons to 06h00 the following Monday morning; - With regard to unavoidable very noisy construction activities in the vicinity of noise sensitive areas, the contractor should liaise with local residents on how best to minimise impact, and the local population should be kept informed of the nature and duration of intended activities; - As construction workers operated in a very noisy environment, it must be ensured that their working conditions comply with the requirements of the Occupational Health and Safety Act (Act No 85 of 1993) and Gauteng Noise Control Regulations, 1999. Where necessary ear protection gear should be worn. <p>O-</p> <ul style="list-style-type: none"> - The design, placement and orientation of the extractor fans for the ventilation of the buildings must take the noise impact aspect into consideration. Equipment with the best noise rating must be used. Roof mounted fans may further require attenuators and need to be screened form noise sensitive areas; - High quality air-conditioning equipment should be installed. Equipment with the best noise | <p>M – To be included in the EMP</p> |
|--|---|---|

| | | |
|--|--|--|
| | <p>rating should be used;</p> <ul style="list-style-type: none"> - Where required, high quality refrigeration compressors should be installed. Equipment with the best noise rating should be used. Exterior building installations should be acoustically encapsulated; - All mechanical equipment is to be well maintained; - The delivery times for trucks should be limited to the hours of between 07h00 and 20h00 on weekdays and between 08h00 and 14h00 on Saturdays (only if applicable); - The noise levels must comply with the Gauteng Noise Control Regulations, 1999 | |
|--|--|--|

Result: *The issue is eliminated by implementing the mitigation measures and can also be turned into a positive impact the significance of this positive impact still need be determined confirmed/assessed in the significance rating table.*

6.2.6 Agricultural Potential

According to the GAPA 3 the agricultural potential of the soils on the study area are located on high and low. **(Refer to Figure 5-Agricultural Potential Map).**

It was concluded that no Agricultural Potential Study is needed for the proposed application site due to the existence of buildings on the site. The development of the proposed site will have no negative economic impact on the Agricultural Land of the Gauteng Province.

The study area is not situated within any of the 7 agricultural hubs identified for Gauteng. **(Refer to Figure 8: – Agricultural Hub Map).**

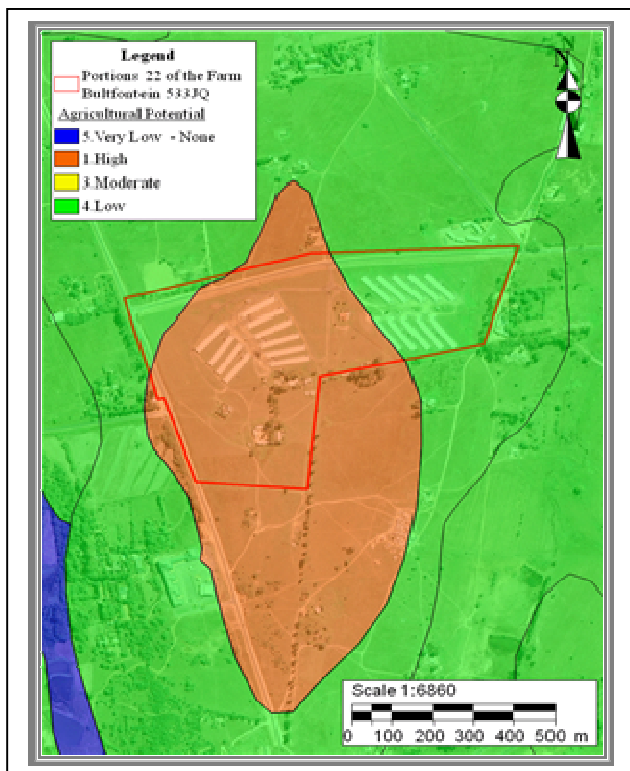


FIGURE 5: Agricultural Potential

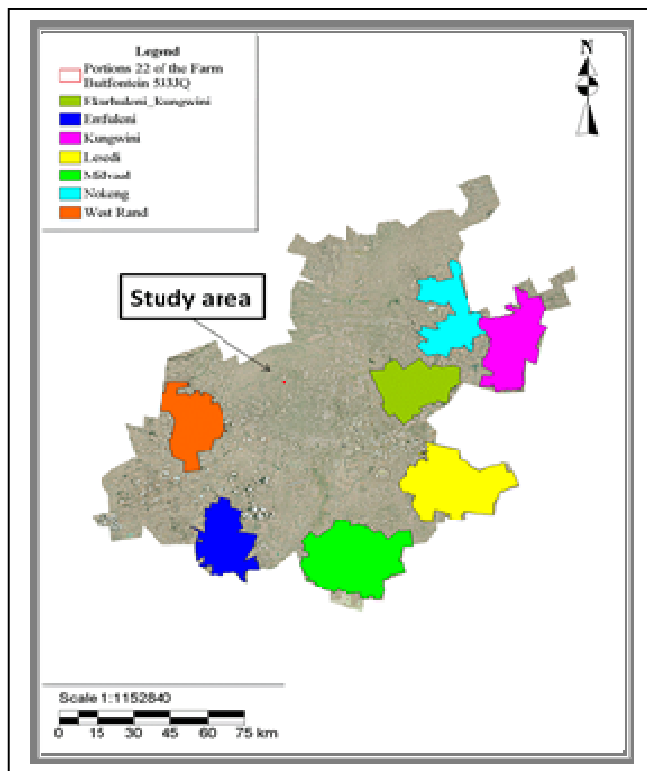


FIGURE 6: Agricultural hubs

6.2.6.a Issues & Impact Identification – Agricultural Potential

Table 48: Issues and Impacts – Agricultural Potential

| | Issue/ Impact | Positive/ Negative/ Neutral ± | Mitigation Possibilities High 🟢 Medium 🟡 Low 🔴 Positive Impact - Not Necessary To Mitigate ✨ |
|-----|--------------------------------------|-------------------------------------|---|
| 37) | Some agricultural land will be lost. | - | 🔴 |

6.2.6.b Discussion of issues identified, possible mitigation measures and significance of issue after mitigation

37) Some agricultural land will be lost.

The study area is covered with both high and low agricultural potential soils, however the study area does not fall within the any of the 7 Agricultural Hub. The study area is situated within the Urban Edge.

Table 49: Significance of Issue 37 (Loss of Agricultural Land) After Mitigation/ Addressing of the Issue

| | | |
|---|--|--|
| <p>Mitigation Possibilities</p> <p>High 🟢 Medium 😊 Low 🟡</p> <p>Positive Impact/ Neutral - Not Necessary To Mitigate ⚙️</p> | <p>Mitigation</p> <p>Already achieved ✓</p> <p>Must be implemented during Planning phase, Construction and/ or Operational phase</p> <p>P / C / O Mitigation</p> | <p>Significance of Issue after mitigation</p> <p>Low/ eliminated L / E</p> <p>Medium M</p> <p>High H</p> <p>Not possible to mitigate, but not regarded as a fatal flaw NP</p> |
| <p>Low 🟡</p> | <p>This issue cannot be mitigated.</p> | <p>NP - Not possible to mitigate, but not regarded as a fatal flaw</p> |

Result: *The issue cannot be mitigated but is not regarded as a fatal flaw. It is however still necessary to assess in the significance rating table.*

6.2.7 Services

Bigen Africa Services was appointed to undertake the design of the Bulk Water Provision, Bulk Sewer Drainage, Internal Water Reticulation and Sewer Reticulation designs for the proposed Lanseria x51 developments.

6.2.7.a Water

Most of the land around the site is still agricultural and very little bulk infrastructure has been installed. There is presently only one water supply line that feeds mainly the Lanseria area. It consists of a 300mm diameter supply pipeline from the Honeydew reservoir in the south (top water level 1672,8m). The line runs through the middle of the site. The capacity in the line is already under pressure, due to the development in and around Lanseria. Water will be supplied to the development from the new Rand Water connection at the Sonneglans Reservoir, near the Beyers Naude/Marina Road intersection. From there a new 700mm diameter pipeline will supply water to the branch via the proposed new 15M³ Lion Park reservoir next to Malibongwe Drive. A 450mm diameter pipeline will link to the reservoir.

A planned 600mm diameter feeder line will supply water from the Lion Park Reservoir to the "Lion Park Reservoir District", in which the site is situated. The supply pipeline is routed next to the R512, (in its new position) and therefore runs along the western boundary of the site. (Bigen Africa Services (Pty) Ltd.: May 2011).

The Municipality must submit the report to their internal service section for comments on this Report.

6.2.7.b Sewerage

There is no existing available bulk sewerage infrastructure near the site. The Lanseria airport building drains to an existing package plant on the eastern side of the airport. Other small commercial developments in the vicinity make use of on-site treatment systems. Johannesburg Water is set against package plants and does not allow any new developments with package plants.

The Master Plan of the area allows for two possible alternatives. The first alternative provides for a pump station at Diepsloot with no connection to the Lanseria System. The

second alternative links the Blue Hills, Summerset, Diepsloot and Dainfern areas to the Lanseria System. The proposed development will increase some of the outfall sizes.

A new Waste Water Treatment Works (WWTW) to the east of Lanseria is proposed for both alternatives.

To drain the Site as required by the Master Plan, the following are required;

Alternative 1

| | | | |
|---|------------------|---|--------|
| From the WWTW to Lanseria South | 675mm dia, 1980m | - | R4,82m |
| Lanseria South to branch from Jukskei River | 525mm dia, 2035m | - | R3,57m |
| Jukskie River to Site boundary | 450mm dia, 2870m | - | R4,32m |
| Through the iste, south to north | 200mm dia, 1180m | - | R0,80m |

Alternative 3

| | | | |
|---|-------------------|---|----------|
| From the WWTW to Lanseria South | 1500mm dia, 1980m | - | R413,95m |
| Lanseria South to branch from Jukskei River | 1350mm dia, 2035m | - | R12.13m |
| Jukskie River to Site boundary | 450mm dia, 2870m | - | R4,32m |
| Through the iste, south to north | 200mm dia, 1180m | - | R0,80m |

6.2.7.c Storm water Management

A Storm water Master Plan for the Lanseria X 51 will be compiled and discussed in the EIA report.

6.2.9.d Electricity

Eskom provide electricity to the area, although the development is situated within the boundaries of the City of Johannesburg.

There is currently no bulk capacity available in the nearby area to supply a development such as Lanseria Extension 51. The existing networks in the area are 11/22kV overhead agricultural/rural electrification networks. These networks will not be able to supply sufficient bulk electricity, even if they are upgraded.

Eskom has made provision for a new bulk substation in the nearby area in the 2010-2020 master plan. The capacity which Eskom has planned for is still to be finalized. A bulk application for a 30MVA substation with 1 spare bay has been submitted by another developer. A site for the proposed substation could possibly be located within the Lanseria Extension 51 development.

The developer will have to install new cables from the proposed substations to be built to a newly created switching station, or directly to the new substation. A new 5.8km 88/132kV line will also have to be constructed to link in with the existing ring network.

The internal design will be done according to the Eskom specifications as the internal network will be handed over to them.

Medium Voltage Reticulation

For the commercial and industrial land portions, the medium voltage network will be an 11kV underground network feeding a configuration of 315kVA and 500kVA miniature substations or dedicated 11kV bulk metering points. The substations will be connected via 185mm² XLPE copper cable ring network from the dedicated switching or sub-station.

Depending on the housing topology and target market for the residential stands, the MV reticulation may either be underground cable or overhead 11kV lines.

Low Voltage Reticulation

For the commercial and industrial land portions, the low voltage network will be an underground cable network supplied from the different miniature substations. The supply

voltage will be 420/240V with a regulation of +12%. The internal low voltage reticulation will be from the miniature substation up to cluster cabinets. The LV feeder cable sizes from the miniature substations will be determined at the final design stage but the following sizes of PVC insulated copper cable will be used.

From the residential land portions, the low voltage network will be either an underground cable network or an overhead aerial bundle conductor supplied from the different miniature substations. The supply voltage will be 420/240V with a regulation of +12%/-12%. The internal low voltage reticulation will be from the miniature substation up to cluster cabinets. The LV feeder cable sizes from the miniature substations will be determined at the final design stage but the following sizes of PVC insulated copper cable will be used.

Street and area Lighting

The street lighting will be a separate underground cable network with control gear. The proposed streetlights will be standard street light fitting with 0.5 to 1.0m outreach, installed at a 5m mounting height on steel galvanized poles or on the LV conductor structures. The typical 70 W HPS or 125 W MV or equivalent type of luminaires can be used. The street lighting will be fed from the control panel within the miniature substations. 10mm² PVC insulate 3-core copper cable with a 10mm² bare copper earth wire will be used to connect all the individual street lights.

6.2.7.f Traffic

The current upgrading of Malibongwe Drive will greatly improve the node's accessibility locally and regionally, via the N14 Highway, which abuts site 2 (Lanseria Extension 53). All access will have to be routed via Malibongwe Drive. In the distant future, some assessment of major upgrades and new planned links, including public transport will be needed. This may have a direct bearing on the node's viability.









Access


Access will have to be routed via Malibongwe Drive and Road K33, which can be accessed via the National Road (N14).

6.2.7.f Issues identified - Services

Table 50: Issues and Impacts – Services

| | Issue/ Impact | Positive/ Negative/ Neutral ± | Mitigation Possibilities High 😊 Medium 😐 Low ☹️ Positive Impact - Not Necessary To Mitigate ☀️ |
|-----|--|--|--|
| 38) | Storm water The proposed development will lead to increased hard surfaces and the quantity and the speed of the storm water across the study area and into the water bodies and adjacent properties will increase. | - | 😊 |
| 39) | Construction works (especially near drainage lines) could cause water pollution, siltation, soil compaction and impacts on sensitive wetlands and eco-systems lower down in the catchment area | - | 😊 |
| 40) | Surface water flows will be altered during the construction phase | - | 😊 |
| 41) | Erosion and siltation | - | 😊 |

| | | | |
|-----|--|--------|---|
| 42) | The use of insufficient drainage systems during the construction phase (i.e. sub-surface drainage systems & no mechanisms to break the speed of the surface water) | - |  |
| 43) | Temporary disruption of services due to relocation and installation of services | - |  |
| 44) | Water supply Water will be supplied to the development from the new Rand Water connection at the Sonneglans Reservoir, near the Beyers Naude/Marina Road intersection. | + - |  |
| 45) | Sewer A new Waste Water Treatment Works (WWTW) to the east of Lanseria is proposed for both alternatives. | + - |  |
| 46) | Electricity Eskom provide electricity to the area, although the development is situated within the boundaries of the City of Johannesburg. | + |  |
| 29) | Traffic The proposed development will lead to the increase in traffic on local and provincial roads – Please refer to Section – 6.2.3.4 | - |  |
| 30) | The increased traffic could cause damage to the surrounding sub- standard roads in the surrounding rural areas - Please refer to Section – 6.2.3.4 | - |  |
| 47) | The proposed development will contribute largely to the upgrading of local and provincial | + |  |

| | | | |
|-----|--|---|---|
| | roads - Please refer to Section 6.2.3.3 | | |
| 48) | <p>Waste Management</p> <p>The construction and operational phases of the proposed development will create large quantities of builder's and domestic waste to be accommodated by local legal landfill sites.</p> | - |  |









6.2.9.g Discussion of issues identified, possible mitigation measures and significance of issue after mitigation

38) The proposed development will lead to increased hard surfaces and the quantity and the speed of the storm water across the study area and into the water bodies and adjacent properties will increase.

Should contaminated storm water run-off from roads not be managed, it could lead to surface water and ground water pollution. Bio-swale and bio-filters could be installed to minimize the risk of pollutants entering the natural drainage system of the area.

This will also raise flood levels of water bodies in the area, if storm water is not managed correctly.

Table 51: Significance of Issue 38 (The proposed development will lead to increased hard surfaces and the quantity and the speed of the storm water across the study area and into the water bodies and adjacent properties will increase.) After Mitigation/ Addressing of the Issue

| | | |
|---|---|--|
| <p>Mitigation Possibilities</p> <p>High  Medium  Low </p> <p>Positive Impact/ Neutral - Not Necessary To Mitigate </p> | <p>Mitigation</p> <p>Already achieved </p> <p>Must be implemented during</p> <p style="padding-left: 20px;"> planning phase,</p> <p style="padding-left: 20px;"> construction and/ or</p> <p style="padding-left: 20px;"> operational phase</p> | <p>Significance of Issue after mitigation</p> <p>Low/ eliminated L / E</p> <p>Medium M</p> <p>High H</p> <p>Not possible to mitigate,</p> |
|---|---|--|

| | P / C / O | but not regarded as a fatal flaw NP |
|----------------|---|---|
| High ☹️ | <p>P - A comprehensive storm water management plan indicating the management of all surface runoff generated as a result of the development (during both the construction and operational phases) prior to entering any natural drainage system or wetland, must be submitted and approved by the local authority and DWS and submitted to GDARD prior to construction activities commencing.</p> <p>P / C - Attenuation ponds and energy dissipaters must be installed on the study area to break the speed of the water and to act as siltation ponds.</p> <p>P / C - Surface storm water generated as a result of the development must not be channeled directly into any natural drainage system or wetland.</p> <p>P - The storm water management plan must indicate how surface runoff will be retained outside of the demarcated buffer/flood zone and how the natural release of retained surface runoff will be simulated.</p> <p>P - The storm water</p> | L – To be included in the EMP |

| | | |
|--|--|--|
| | <p>management plan should be designed in a way that aims to ensure that post development runoff does not exceed predevelopment values in:</p> <ul style="list-style-type: none"> •Peak discharge for any given storm; •Total volume of runoff for any given storm; •Frequency of runoff; and •Pollutant and debris concentrations reaching water courses. <p>P/ C - Bio-swale and bio-filters could be installed to minimize the risk of pollutants entering the natural drainage system of the area.</p> | |
|--|--|--|

Result: Although issue can be mitigated, the significance of the impact should still be determined / confirmed assessed in the Significance Rating Table.

39) If not planned and managed correctly, construction works (especially near drainage lines) could cause water pollution, siltation, soil compaction and detrimental impacts on sensitive wetlands and eco-systems lower down in the catchment area.

Table 52: Significance of Issue 39 (Construction works (especially near drainage lines) could cause water pollution, siltation, soil compaction and impacts on sensitive wetlands and eco-systems lower down in the catchment area) After Mitigation/ Addressing of the Issue

| | | |
|--|---|--|
| <p>Mitigation Possibilities</p> <p>High 🟢 Medium 😊 Low 🟡</p> <p>Positive Impact/ Neutral - Not Necessary To Mitigate ☀️</p> | <p>Mitigation</p> <p>Already achieved ✓</p> <p>Must be implemented during planning phase,</p> | <p>Significance of Issue after mitigation</p> <p>Low/ eliminated L / E</p> <p>Medium M</p> |
|--|---|--|

| | | |
|--------|--|---|
| | <p>construction and/ or operational phase P / C / O</p> | <p>High H Not possible to mitigate, but not regarded as a fatal flaw NP</p> |
| High 😊 | <p>P - A comprehensive storm water management plan indicating the management of all surface runoff generated as a result of the development (during both the construction and operational phases) prior to entering any natural drainage system must be submitted and approved by the local authority and DWAF and submitted to GDARD prior to construction activities commencing.</p> <p>P - Construction guidelines shall be provided for the prevention and restriction of erosion and siltation during both the construction and operational phases.</p> <p>P / C - Attenuation ponds and energy dissipaters must be installed on the study area to break the speed of the water and to act as siltation ponds.</p> <p>P / C - Surface storm water generated as a result of the development must not be channeled directly into any natural drainage system or wetland.</p> <p>P - The storm water management plan must indicate how surface runoff</p> | <p>L - To be included in the EMP</p> |

| | | |
|--|--|--|
| | <p>will be retained outside of the demarcated buffer/flood zone and how the natural release of retained surface runoff will be simulated.</p> <p>P - The storm water management plan should be designed in a way that aims to ensure that post development runoff does not exceed predevelopment values in:</p> <ul style="list-style-type: none"> • Peak discharge for any given storm; • Total volume of runoff for any given storm; • Frequency of runoff; and • Pollutant and debris concentrations reaching water courses. <p>P/C - Bio-swale and bio-filters could be installed to minimize the risk of pollutants entering the natural drainage system of the area.</p> | |
|--|--|--|

Result:

Although issue can be mitigated, the significance of the impact should still be determined / confirmed assessed in the Significance Rating Table.

40) Due to the excavations that will take place (there will be trenches and topsoil as well as subsoil mounds in and around the study area) the topography of the study area will temporarily be altered. This will however only be a short-term impact and if the levels are restored to normal (the surface drainage patterns from the new levels should not differ too much from the surface water drainage of the original levels) once the construction phase is completed.

Table 53: Significance of Issue 40 (Surface water flows will be altered during the construction phase) After Mitigation/ Addressing of the Issue

| <p>Mitigation Possibilities</p> <p>High 🟢 Medium 😊 Low 🟡</p> <p>Positive Impact/ Neutral - Not Necessary To Mitigate ☀️</p> | <p>Mitigation</p> <p>Already achieved ✓</p> <p>Must be implemented during</p> <p>planning phase,</p> <p>construction and/ or</p> <p>operational phase</p> <p>P / C / O</p> | <p>Significance of Issue after mitigation</p> <p>Low/ eliminated L / E</p> <p>Medium M</p> <p>High H</p> <p>Not possible to mitigate, but not regarded as a fatal flaw NP</p> |
|--|---|---|
| <p>High 🟢</p> | <p>P/C – Construction activities should preferably take place during the winter months</p> <p>P/C - If it is not possible for construction activities to take place during the winter months, construction activities should take place in phases in order to prevent large exposed areas that will cause an increase in the speed of surface water.</p> <p>P - When storm water planning is done, every attempt possible should be made to keep the post construction and pre-construction flows similar.</p> | <p>M – To be included in the EMP</p> |

Result:

Although issue can be mitigated, the significance of the impact should still be determined / confirmed assessed in the Significance Rating Table.

41) Unnecessary loss of soil, erosion through bad management as well as the compaction of soils due to traffic and equipment must be prevented.

Table 54: Significance of Issue 41 (Erosion and siltation) After Mitigation/ Addressing of the Issue

| <p>Mitigation Possibilities</p> <p>High 🟢 Medium 🟡 Low 🔴</p> <p>Positive Impact/ Neutral - Not Necessary To Mitigate ☀️</p> | <p>Mitigation</p> <p>Already achieved ✓</p> <p>Must be implemented during</p> <ul style="list-style-type: none"> planning phase, construction and/ or operational phase <p>P / C / O</p> | <p>Significance of Issue after mitigation</p> <p>Low/ eliminated L / E</p> <p>Medium M</p> <p>High H</p> <p>Not possible to mitigate, but not regarded as a fatal flaw NP</p> |
|--|---|---|
| <p>High 🟢</p> | <p>P / C - Excavate only where necessary and mark out the areas to be excavated.</p> <p>P / C - The top layer of all areas to be excavated for the purpose of construction must 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 and for landscaping purposes.</p> <p>C - When the stripping of topsoil takes place, the grass component shall be included in the stripped topsoil. The soil will contain a natural grass seed mixture that may assist in the re-growth of grass once the soil is used for back filling and landscaping.</p> <p>P / C / O - Mechanisms are required for dissipating water energy of storm water</p> | <p>L – To be included in the EMP</p> |

Result:

Although issue can be mitigated, the significance of the impact should still be determined / confirmed and assessed in the Significance Rating Table.

42) The use of insufficient drainage systems including sub-surface drainage systems and no mechanisms to break the speed of surface water during the construction phase.

Table 55: Significance of Issue 42 (The use of insufficient drainage systems during the construction phase (i.e. sub-surface drainage systems & no mechanisms to break the speed of the surface water) After Mitigation/ Addressing of the Issue

| <p>Mitigation Possibilities</p> <p>High 🟢 Medium 😊 Low 🟡</p> <p>Positive Impact/ Neutral - Not Necessary To Mitigate ☀️</p> | <p>Mitigation</p> <p>Already achieved ✓</p> <p>Must be implemented during</p> <p>planning phase,</p> <p>construction and/ or</p> <p>operational phase</p> <p>P / C / O</p> | <p>Significance of Issue after mitigation</p> <p>Low/ eliminated L / E</p> <p>Medium M</p> <p>High H</p> <p>Not possible to mitigate, but not regarded as a fatal flaw NP</p> |
|--|---|---|
| <p>High 🟢</p> | <p>P/C/O - Attenuation ponds and energy dissipaters must be installed on the study area to break the speed of the water and to act as siltation ponds</p> <p>C – Implement temporary storm water management measures that will help to reduce the speed of surface water. These measures will also assist with the prevention of water pollution, erosion and siltation.</p> <p>P/C - In order to prevent large exposed areas, it is</p> | <p>L – To be included in the EMP</p> |

| | | |
|--|--|--|
| | <p>recommended that the construction of the development be done in phases. Each phase should be rehabilitated immediately after the construction for that phase has been completed. The rehabilitated areas should be maintained by the appointed rehabilitation contractor until a vegetative coverage of at least 75% has been achieved.</p> <p>C - No excavated materials should be dumped in or near drainage channels.</p> | |
|--|--|--|

Result:

Although issue can be mitigated, the significance of the impact should still be determined / confirmed assessed in the Significance Rating Table.

43) Construction of the new development may cause damage to the existing services and infrastructure and will disrupt service provision (i.e. electricity, water, Telkom cables) to local residents on surrounding properties during the construction phase.

Table 56: Significance of Issue 43 (Damage to existing services) After Mitigation/ Addressing of the Issue

| | | |
|--|---|---|
| <p>Mitigation Possibilities</p> <p>High 🟢 Medium 🟡 Low 🔴</p> <p>Positive Impact/ Neutral - Not Necessary To Mitigate ☀️</p> | <p>Mitigation</p> <p>Already achieved ✓</p> <p>Must be implemented during</p> <p>planning phase,</p> <p>construction and/ or</p> <p>operational phase</p> <p>P / C / O</p> | <p>Significance of Issue after mitigation</p> <p>Low/ eliminated L / E</p> <p>Medium M</p> <p>High H</p> <p>Not possible to mitigate, but not regarded as a fatal flaw NP</p> |
|--|---|---|

| | | |
|----------------------|---|---|
| <p>High 🟡</p> | <p>P/ C – Determine areas where services will be upgraded and relocated well in advance. Discuss possible disruptions with affected parties to determine most convenient times for service disruptions and warn affected parties well in advance of dates that service disruptions will take place</p> | <p>M – To be included in the EMP</p> |
|----------------------|---|---|

Result:

Although issue can be mitigated, the significance of the impact should still be determined / confirmed assessed in the Significance Rating Table.

44) During the construction and operational phases waste would be generated on site. The waste may consist of the following waste streams, namely:

- Liquid waste from vehicles;
- Solid domestic waste; and
- Solid construction waste.

Disposal of some of the above waste streams may lead to soil, water and aesthetic pollution of the site. The soil and water pollution should be localised with little impact on the surrounding environment. Waste disposal on site may stimulate the surrounding population to also dispose domestic waste on the site. This may lead to an uncontrolled situation that would be aesthetically unacceptable to future occupants and costly to rehabilitate.

The disposal of large quantities of waste during both the construction an operational phases, would place a burden on landfill sites in the area to accommodate the additional volumes. Although this waste is inert in most cases, it may be of significant proportions and will contribute to the saturation of the formal landfill sites in the area.

Table 57: Significance of Issue 44 (The construction and operational phases of the proposed development will create large quantities of builder’s and domestic waste and liquids) After Mitigation/ Addressing of the Issue

| <p>Mitigation Possibilities</p> <p>High 🟢 Medium 🟡 Low 🔴</p> <p>Positive Impact/ Neutral - Not Necessary To Mitigate ✨</p> | <p>Mitigation</p> <p>Already achieved ✓</p> <p>Must be implemented during</p> <p>planning phase,</p> <p>construction and/ or</p> <p>operational phase</p> <p>P / C / O</p> | <p>Significance of Issue after mitigation</p> <p>Low/ eliminated L / E</p> <p>Medium M</p> <p>High H</p> <p>Not possible to mitigate, but not regarded as a fatal flaw NP</p> |
|---|--|---|
| <p>Medium 🟡</p> | <p>C – Prevent unhygienic usage on site and pollution of the natural assets. Develop a central waste temporary holding site to be used during construction. (Near the access entrance). This site should comply with the following:</p> <ul style="list-style-type: none"> - Skips for the containment and disposal of waste that could cause soil and water pollution, i.e. paint, lubricants, etc.; - Small lightweight waste items should be contained in skips with lids to prevent wind littering; - Bunded areas for containment and holding of dry building waste. - THESE AREAS SHALL BE PREDETERMINED AND LOCATED IN AREAS THAT IS ALREADY | <p>L – To be included in the EMP</p> |

| | | |
|--|--|--|
| | <p>DISTURBED. THESE AREAS SHALL NOT BE IN CLOSE PROXIMITY OF DRAINAGE CHANNELS.</p> <p>C - Workers will only be allowed to use temporary chemical toilets on the site. CHEMICAL TOILETS SHALL NOT BE IN CLOSE PROXIMITY OF DRAINAGE CHANNELS.</p> <p>C - No French drain systems may be installed.</p> <p>C - No bins containing organic solvents such as paints and thinners shall be cleaned on site, unless containers for liquid waste disposal are placed for this purpose on site; All waste must be removed to a recognized waste disposal site on a weekly basis. No waste materials may be disposed of on or adjacent to the site. The storage of solid waste on site, until such time that it may be disposed of, must be in the manner acceptable to the Local Authority</p> <p>C - Keep records of waste reuse, recycling and disposal for future reference. Provide information to ECO. (Environmental Control Officer)</p> | |
|--|--|--|

Result:

Although issue can be mitigated, the significance of the impact should still be determined / confirmed assessed in the Significance Rating Table.

6.2.8 Public Participation

Refer to Annexure I

Public Participation is a cornerstone of any environmental impact assessment. The principles of the National Environment Management Act, 1998 (Act No. 107 of 1998) govern many aspects of environmental impact assessments, including public participation. These include provision of sufficient and transparent information on an ongoing basis to the stakeholders to allow them to comment and ensuring the participation of previously disadvantaged people, women and youth.

Effective public involvement is an essential component of many decision-making structures, and effective community involvement is the only way in which the power given to communities can be used efficiently. The public participation process is designed to provide sufficient and accessible information to interested and affected parties (I&AP's) in an objective manner to assist them to:

- Raise issues of concern and suggestions for enhanced benefits.
- Verify that their issues have been captured.
- Verify that their issues have been considered by the technical investigations.
- Comment on the findings of the EIA.

Scoping Phase

Stakeholders (I&AP's) were notified of the Environmental Evaluation Process through:

- 1) A site notice that was erected (at a prominent point on the study area) on 8 September 2011 (***Refer to Annexure I i for proof of notice***).
- 2) Notices were distributed to the surrounding land-owners and interested and affected parties by means of faxes, hand delivery and e-mail on 13 September 2011 (***Refer to Annexure I ii for proof of public notice***);

- 3) An advertisement was placed in the Beeld newspaper on 8 September 2011 (**Refer to Annexure I iii for proof of advertisement**); and
- 4) The Draft Scoping Report was available for review by I&APs for a period of 40 days.

EIA Phase

Stakeholders (I&AP's) were notified of the Environmental Impact Assessment process through:

- 1) A site notice that was erected (at a prominent point on the study area) on 11 Augustus 2015 (**Refer to Annexure li for proof of notice**).
 - 2) Notices were distributed to the surrounding land-owners and interested and affected parties by means of faxes, hand delivery and e-mail on 11 Augustus 2015 (**Refer to Annexure I ii for proof of public notice**);
 - 3) An advertisement was placed in the Beeld newspaper on 12 Augustus 2015 (**Refer to Annexure I iii for proof of advertisement**); and
 - 4) The Final Scoping Report was available for review by I&APs for a period of 40 days.
- To date six (6) Interested and Affected Parties have registered (**Refer to Annexure I iv for a list of registered Interested and Affected parties**); and

7. SIGNIFICANCE ASSESSMENT

7.1 Description of Significance Assessment Methodology

The significance of Environmental Impacts was assessed in accordance with the following method:

Significance is the product of probability and severity. Probability describes the likelihood of the impact actually occurring, and is rated as follows:

-
- Improbable - Low possibility of impact to occur either because of design or historic experience.
Rating = 2

 - Probable - Distinct possibility that impact will occur.
Rating = 3

 - Highly probable - Most likely that impact will occur.
Rating = 4

 - Definite - Impact will occur, in the case of adverse impacts regardless of any prevention measures.
Rating = 5

The **severity factor** is calculated from the factors given to “intensity” and “duration”. Intensity and duration factors are awarded to each impact, as described below.

The **Intensity factor** is awarded to each impact according to the following method:

- Low intensity - natural and man made functions not affected – Factor 1

- Medium intensity - environment affected but natural and man made functions and processes continue - Factor 2

- High intensity - environment affected to the extent that natural or man made functions are altered to the extent that it will temporarily or

permanently cease or become dysfunctional
- Factor 4

Duration is assessed and a factor awarded in accordance with the following:

- Short term - <1 to 5 years - Factor 2
- Medium term - 5 to 15 years - Factor 3
- Long term - impact will only cease after the operational life of the activity, either because of natural process or by human intervention - factor 4.
- Permanent - mitigation, either by natural process or by human intervention, will not occur in such a way or in such a time span that the impact can be considered transient - Factor 4.

The **severity rating** is obtained from calculating a severity factor, and comparing the severity factor to the rating in the table below. For example:

$$\begin{aligned} \text{The Severity factor} &= \text{Intensity factor X Duration factor} \\ &= 2 \times 3 \\ &= 6 \end{aligned}$$

A **Severity factor** of six (6) equals a Severity Rating of Medium severity (Rating 3) as per table below:

TABLE 58: SEVERITY RATINGS

| RATING | FACTOR |
|---|----------------------------|
| Low Severity (Rating 2) | Calculated values 2 to 4 |
| Medium Severity (Rating 3) | Calculated values 5 to 8 |
| High Severity (Rating 4) | Calculated values 9 to 12 |
| Very High severity (Rating 5) | Calculated values 13 to 16 |
| Severity factors below 3 indicate no impact | |

A Significance Rating is calculated by multiplying the Severity Rating with the Probability Rating.

The ***significance rating*** should influence the development project as described below:

- Low significance (calculated Significance Rating 4 to 6)
 - Positive impact and negative impacts of low significance should have no influence on the proposed development project.

- Medium significance (calculated Significance Rating >6 to 15)
 - Positive impact:
Should weigh towards a decision to continue
 - Negative impact:
Should be mitigated to a level where the impact would be of medium significance before project can be approved.

- High significance (calculated Significance Rating 16 and more)
 - Positive impact:

Should weigh towards a decision to continue, should be enhanced in final design.

- Negative impact:
Should weigh towards a decision to terminate proposal, or mitigation should be performed to reduce significance to at least medium significance rating.

7.2 Significance Assessment of Anticipated Impacts

Impacts indicated under each section of the environment were each assessed according to the above methodology. **Table 63** below contains the results of the significance assessment.

TABLE 59: RESULT OF SIGNIFICANCE ASSESSMENT OF IMPACTS IDENTIFIED TO BE ASSOCIATED WITH THE PROPOSED TWENTY ONE TOWNSHIP 4 DEVELOPMENT (AFTER MITIGATION)

| Impact | Probability Rating | Severity Rating | | Severity Factor | Severity Rating | Significance Rating |
|---|--------------------|-----------------|----------|-----------------|-----------------|---------------------|
| | | Intensity | Duration | | | |
| CONSTRUCTION PHASE | | | | | | |
| Beneficial Impacts | | | | | | |
| 17. The eradication of weeds and exotic invaders | 5 | 4 | 3 | 12 | 4 | 20 High |
| 11. Due to the topography only parts of the development will be visible from view sheds in the flatter areas around the study area. The development will be very visible from the R21 Freeway. | 4 | 2 | 4 | 8 | 3 | 12 Medium |
| 28. Creation of temporary Job opportunities. | 5 | 4 | 2 | 8 | 3 | 15 Medium |

| Adverse Impacts | | | | | | |
|---|---|---|---|----|---|-----------|
| 1. Restriction on land use types due to geology: Sections of the site are not suitable for residential structures. | 5 | 4 | 4 | 16 | 5 | 25 High |
| 2. Risk for formation of sinkholes and dolines if <i>precautionary measures for construction on dolomite are not followed and if an effective storm water management plan is not implemented.</i> | 4 | 4 | 4 | 16 | 5 | 20 High |
| 3. Stability of structures if foundation requirements from geotechnical engineer and <i>precautionary measures for construction on dolomite are not followed.</i> | 3 | 4 | 4 | 16 | 5 | 15 Medium |
| 4. Excavation problems are expected and some blasting may be required. | 3 | 4 | 4 | 16 | 5 | 15 Medium |
| 5. Erosion may be caused by the construction activities on site. | 3 | 4 | 2 | 8 | 3 | 9 Medium |
| 6. Incorrect topsoil stockpiling may cause a loss of topsoil or pollution and stockpile areas for construction materials may cause soil and visual pollution. | 4 | 2 | 4 | 8 | 3 | 12 Medium |
| 7,8 & 9. Siltation, erosion and ground water pollution could occur if a storm water management plan is not implemented. | 4 | 2 | 4 | 8 | 3 | 12 Medium |
| 11. Due to the topography only parts of the development will be visible from view sheds in the flatter areas around the study area. It will be very visible from the R21 Albertina Sisulu Freeway. | 4 | 2 | 4 | 8 | 3 | 12 Medium |
| 13. Construction during the wet season | 3 | 2 | 2 | 4 | 2 | 6 Low |

| | | | | | | |
|---|---|---|---|----|---|----------------|
| may cause erosion and delays to the construction phase. | | | | | | |
| 14. Construction during the dry and windy season may cause dust pollution. | 3 | 2 | 2 | 4 | 2 | 6 Low |
| 15. Loss of sensitive grassland areas. | 5 | 4 | 4 | 16 | 5 | 25 High |
| 16. Loss of orange listed and medicinal plant species. | 3 | 4 | 3 | 12 | 4 | 12 Medium |
| 18. If the entire area to be developed is cleared at once, smaller birds, mammals and reptiles will not be afforded the chance to weather the disturbance in an undisturbed zone close to their natural territories. | 3 | 4 | 3 | 12 | 4 | 12 Medium |
| 19. Noise impact of construction machinery. | 3 | 2 | 2 | 4 | 2 | 6 Low |
| 20. During the construction and operational phase (if not managed correctly) fauna species could be disturbed, trapped, hunted or killed. | 3 | 4 | 3 | 12 | 4 | 12 Medium |
| 21. Loss of habitat can lead to the decrease of fauna numbers and species. | 5 | 4 | 4 | 16 | 5 | 25 High |
| 22. Structures of cultural significance may be destroyed. | 5 | 4 | 4 | 16 | 5 | 25 High |
| 25. Possibility of illegal settlements. | 3 | 2 | 2 | 4 | 2 | 6 Low |
| 31. Traffic increase in the area, will have an impact on the traffic flow and the tranquility of the area | 5 | 2 | 4 | 8 | 3 | 15 Medium |
| 30. Possible illegal settlements and increased security problems | 3 | 2 | 2 | 4 | 2 | 6 Low |
| 32. | 3 | 4 | 4 | 16 | 5 | 15 |

| | | | | | | |
|--|---|---|---|----|---|--------------|
| Damage to the existing services and infrastructure during the construction phase and disruptions in services (i.e. electricity, water, damage to Telkom cables) during the construction phase. | | | | | | Medium |
| 33. Dangerous excavations | 3 | 4 | 4 | 16 | 5 | 15 Medium |
| 36. If not planned and managed correctly, the proposed development could have a negative impact on the "Sense of Place" of the study area and its surroundings) | 3 | 2 | 2 | 4 | 2 | 6 Low |
| 39. Construction works (especially in the drainage lines) could cause water pollution, siltation, soil compaction and impacts on sensitive wetlands and eco-systems lower down in the catchment area | 3 | 2 | 2 | 4 | 2 | 6 Low |
| 40. Surface water flows will be altered during the construction phase | 3 | 2 | 2 | 4 | 2 | 6 Low |
| 41. Erosion (gully formation) and siltation | 3 | 2 | 2 | 4 | 2 | 6 Low |
| 42. The use of insufficient drainage systems during the construction phase (i.e. sub-surface drainage systems & no mechanisms to break the speed of the surface water) | 3 | 2 | 2 | 4 | 2 | 6 Low |
| 48. The creation of large quantities of builder's and domestic waste to be accommodated by local legal landfill sites. | 4 | 4 | 2 | 8 | 3 | 12 Medium |
| OPERATION PHASE | | | | | | |
| Beneficial Impacts | | | | | | |
| 11. Due to the topography only parts of the development will be visible from view sheds in the flatter areas around the study area. The development will | 4 | 2 | 4 | 8 | 3 | 12 Medium |

| | | | | | | |
|--|---|---|---|----|---|----------------|
| be very visible from the R21 Freeway which will give exposure to the commercial erven located along the freeway. | | | | | | |
| 47. Upgrading of municipal services | 5 | 4 | 4 | 16 | 5 | 25 High |
| 45. Upgrading of provincial and local roads | 5 | 4 | 4 | 16 | 5 | 25 High |
| 27. Increase in adjacent land-values | 3 | 4 | 4 | 16 | 5 | 15 Medium |
| 28. Rates and taxes payable to the local authority of the new residents will increase the income of the local authority. | 5 | 4 | 4 | 16 | 5 | 25 High |
| 29. The supply of a mixed use development within the R21 Corridor. | 5 | 4 | 4 | 16 | 5 | 25 High |
| 26. Creation of temporary and permanent Job opportunities. | 5 | 4 | 4 | 16 | 5 | 25 High |
| 34. The proposed development will be in line with the international, national, provincial and local legislation, planning frameworks, guidelines, policies etc. | 5 | 4 | 4 | 16 | 5 | 25 High |
| 46. The availability of electricity for the development has been confirmed. | 5 | 4 | 4 | 16 | 5 | 25 High |
| Adverse Impacts | | | | | | |
| 1. Restriction on land use types due to geology: only sections of the site are suitable for residential structures. | 5 | 4 | 4 | 16 | 5 | 25 High |
| 2. Risk for formation of sinkholes and dolines if <i>precautionary measures for construction on dolomite are not followed and if an effective storm water management plan is not implemented.</i> | 4 | 4 | 4 | 16 | 5 | 20 High |

| | | | | | | |
|--|---|---|---|----|---|----------------|
| 8. Risk of the lowering of groundwater | 3 | 4 | 4 | 16 | 5 | 15 Medium |
| 9. Possible ground water pollution. | 3 | 4 | 4 | 16 | 5 | 15 Medium |
| 11. If not planned correctly, roofs and parking areas could reflect the sun into the eyes of oncoming traffic and surrounding landowners. | 2 | 2 | 4 | 8 | 3 | 6 Low |
| 12. If not planned and managed correctly the lights (interior and exterior) and the signage of the development could cause visual pollution. | 2 | 2 | 4 | 8 | 3 | 6 Low |
| 15. Loss of sensitive grassland areas. | 5 | 4 | 4 | 16 | 5 | 25 High |
| 16. Loss of orange listed and medicinal plant species. | 3 | 4 | 4 | 16 | 5 | 15 Medium |
| 22. Structures of cultural significance may be destroyed. | 5 | 4 | 4 | 16 | 5 | 25 High |
| 37. Some agricultural land will be lost. | 4 | 2 | 4 | 8 | 3 | 12 Medium |
| 31. Traffic increase in the area, will have an impact on the traffic flow of the area | 5 | 2 | 4 | 8 | 3 | 15 Medium |
| 36. If not planned and managed correctly, the proposed development could have a negative impact on the "Sense of Place" of the study area and its surroundings) | 3 | 2 | 2 | 4 | 2 | 6 Low |
| 38. Increased surface water run-off to storm water management system from hard surfaces such as roofs and paved areas may impact on surface and ground water. | 2 | 2 | 4 | 8 | 3 | 6 Low |
| 48. The creation of large quantities of builder's and domestic waste to be accommodated by local legal | 4 | 4 | 2 | 8 | 3 | 12 Medium |

| | | | | | | |
|-----------------|--|--|--|--|--|--|
| landfill sites. | | | | | | |
|-----------------|--|--|--|--|--|--|

7.3 Discussion of Significance Assessment

Fifteen beneficial impacts associated with the proposed development are anticipated, of which eleven have a high significance rating. The Environmental Management Plan (**Refer to Annexure H**) contains measures to achieve maximum gain from the above beneficial impacts. Fourteen of the anticipated beneficial impacts are Socio-economic related, and one relate to the physical environment. This indicates that the proposed development should contribute to an improvement in the quality of life of the people residing in the broader area and the quality of the physical environment.

Of the forty four anticipated adverse impacts associated with the construction and occupation phases of the proposed development nine of the anticipated impacts have a high significance rating, twenty-nine impacts have a medium significance rating and fourteen have a low significance rating.

Measures that are recommended in this report and the Environmental Management Plan could mitigate the medium and high-anticipated adverse impacts to an acceptable level. No “fatal flaw” adverse impacts, or adverse impacts that cannot be adequately mitigated, are anticipated to be associated with the proposed development of Twenty One Township 3 development.

8. CONCLUSION

The purpose of the EIA (Environmental Impact Assessment) process was to further investigate the Biophysical and Socio-economic environments by means of specialist studies to identify further issues/impacts of the proposed Lanseria x 51 on these environments. Further, to provide mitigation measures for adverse impacts and to assess the significance of these impacts over the short and long term.

The results of the specialist studies that were done and the layout workshops that were held (the various specialists attended the layout workshops) made it possible to produce a final layout for the proposed mixed use development that takes all the environmental issues identified into consideration.

As environmental consultants we feel satisfied that all site sensitivities were taken into consideration when the layout was finalised and it is recommended that the proposed final layout (**included as Annexure F**) be accepted as the layout for the development.

The most significant issues that were identified are the following:

Biophysical Environment:

- 1) The study area is underlain by the Halfway House Granite Site which consists mostly of granite and granite gneiss of the Basement Complex.
- 2) The possible impact of the development on the ground water and surface water quality in the catchment area.
- 3) The proposed development will result in the loss of sensitive grassland areas.

Social and Economical Environment:

- 1) Services are available for the proposed development. However, some upgrading of existing services is required.
- 2) The developer will deliver a large contribution to the infrastructure in the area.

- 3) The provision of a large number of job opportunities both during the construction and the operational phases of the development.
- 4) The proposed development will contribute to rates and taxes payable to City of Tshwane.
- 5) The loss of agricultural land.
- 6) The proposed development will supply a large number of community facilities in the area.

9. RECOMMENDATIONS

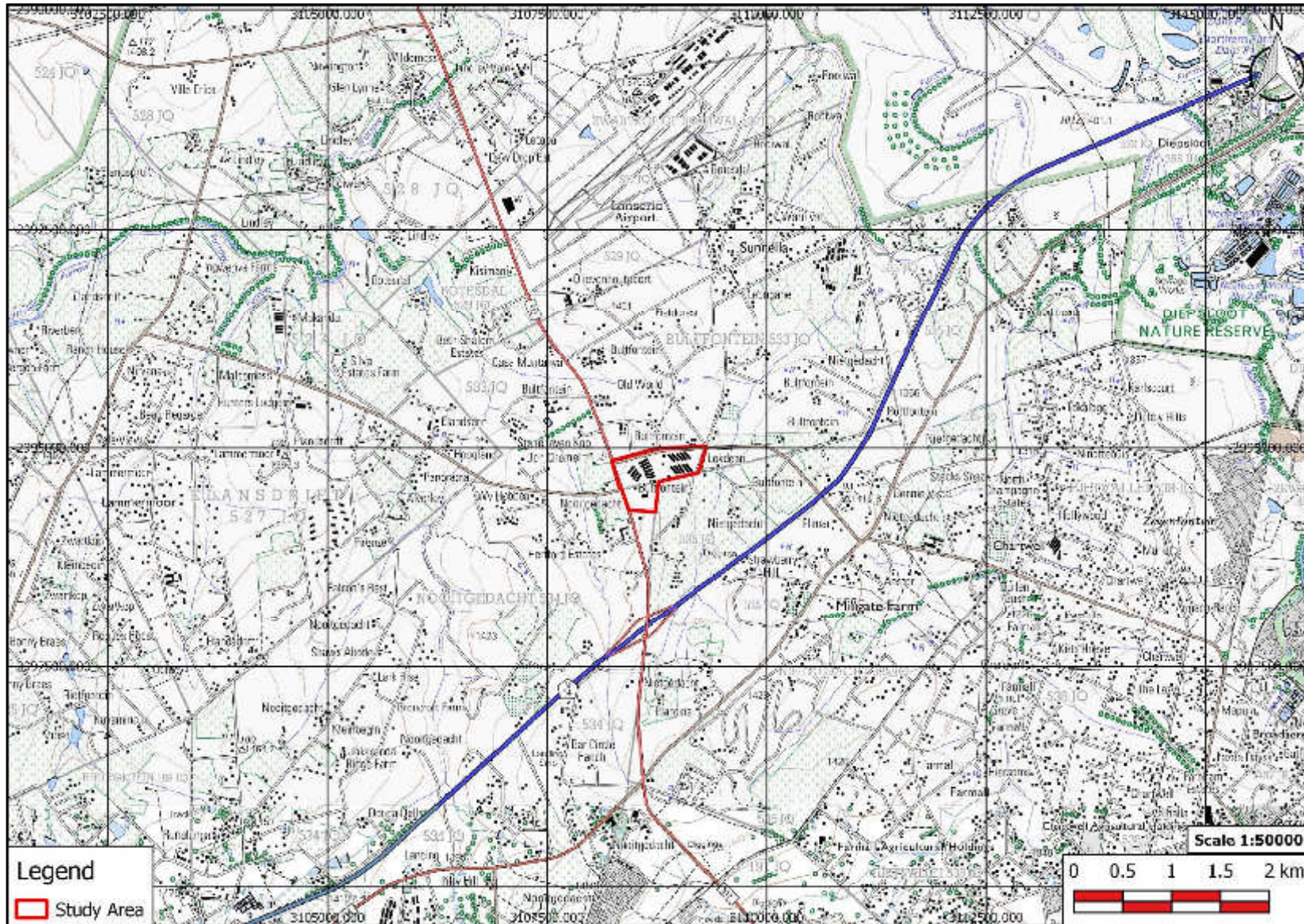
It is believed that the impacts identified have not been of such a nature that short and long term mitigation cannot occur and therefore it is recommended that the proposed development be approved subject to:

- 1) The implementation of the mitigation measures contained in the Environmental Management Plan (**Annexure H**) to achieve maximum advantage from beneficial impacts, and sufficient mitigation of adverse impacts;
- 2) The provision of a large continuous open space system linked to the larger open space system;
- 3) The conservation of the identified cultural sites;
- 4) The required upgrading of existing services and infrastructure;
- 5) The implementation of a Stormwater Management Plan approved by the local authority and DWS;
- 6) Confirmation regarding the availability of essential services from the relevant departments of City of Tshwane; and
- 7) The implementation of a Solid Waste Management Plan.

Enlargements of Figures

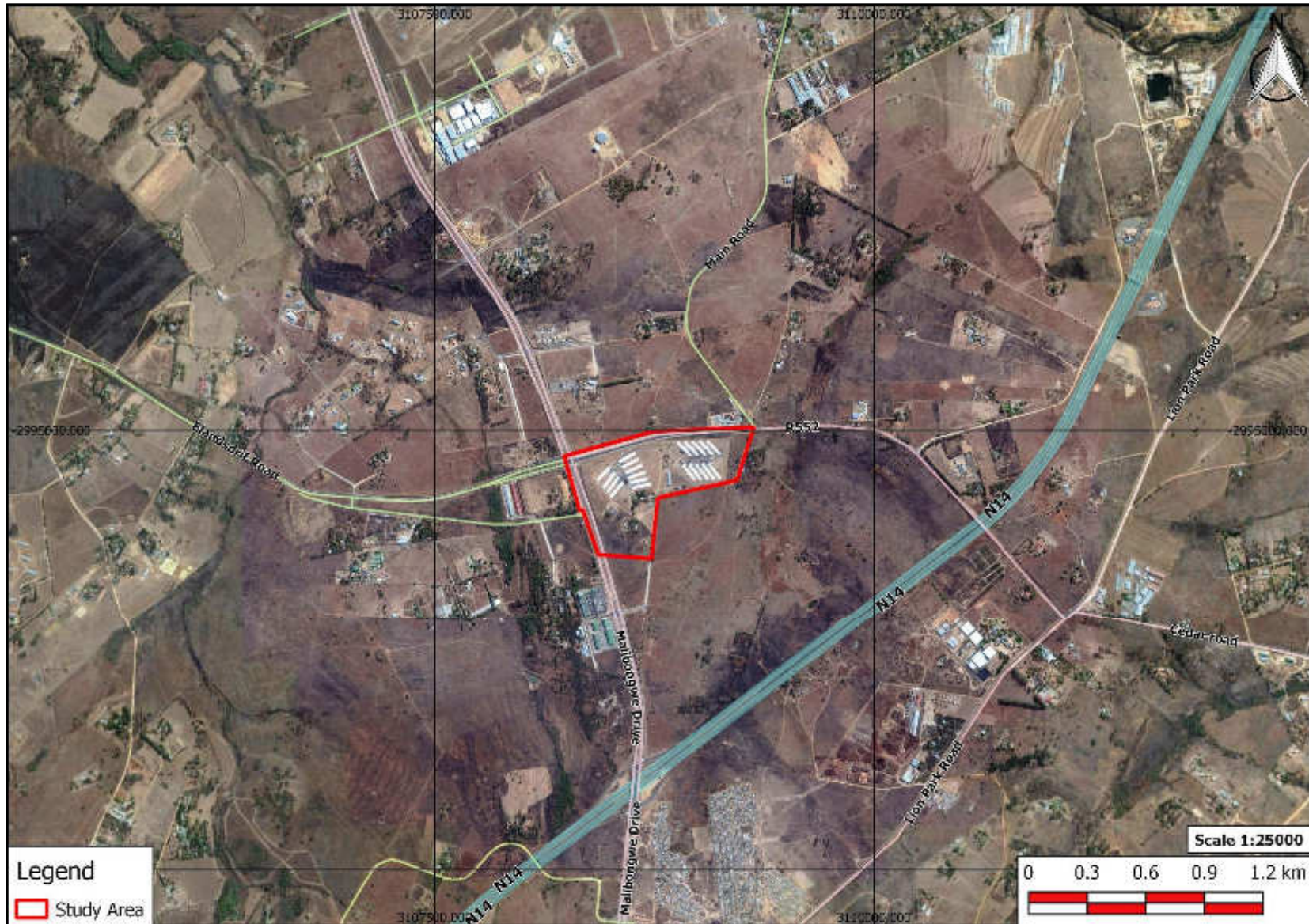


Lanseria X51 Locality Map



Projection – Transverse Mercator
Datum - Hartbeeshoek 1994
Reference Ellipsoid – WGS 1984
Central Meridian -29

Lanseria X51 Aerial Map

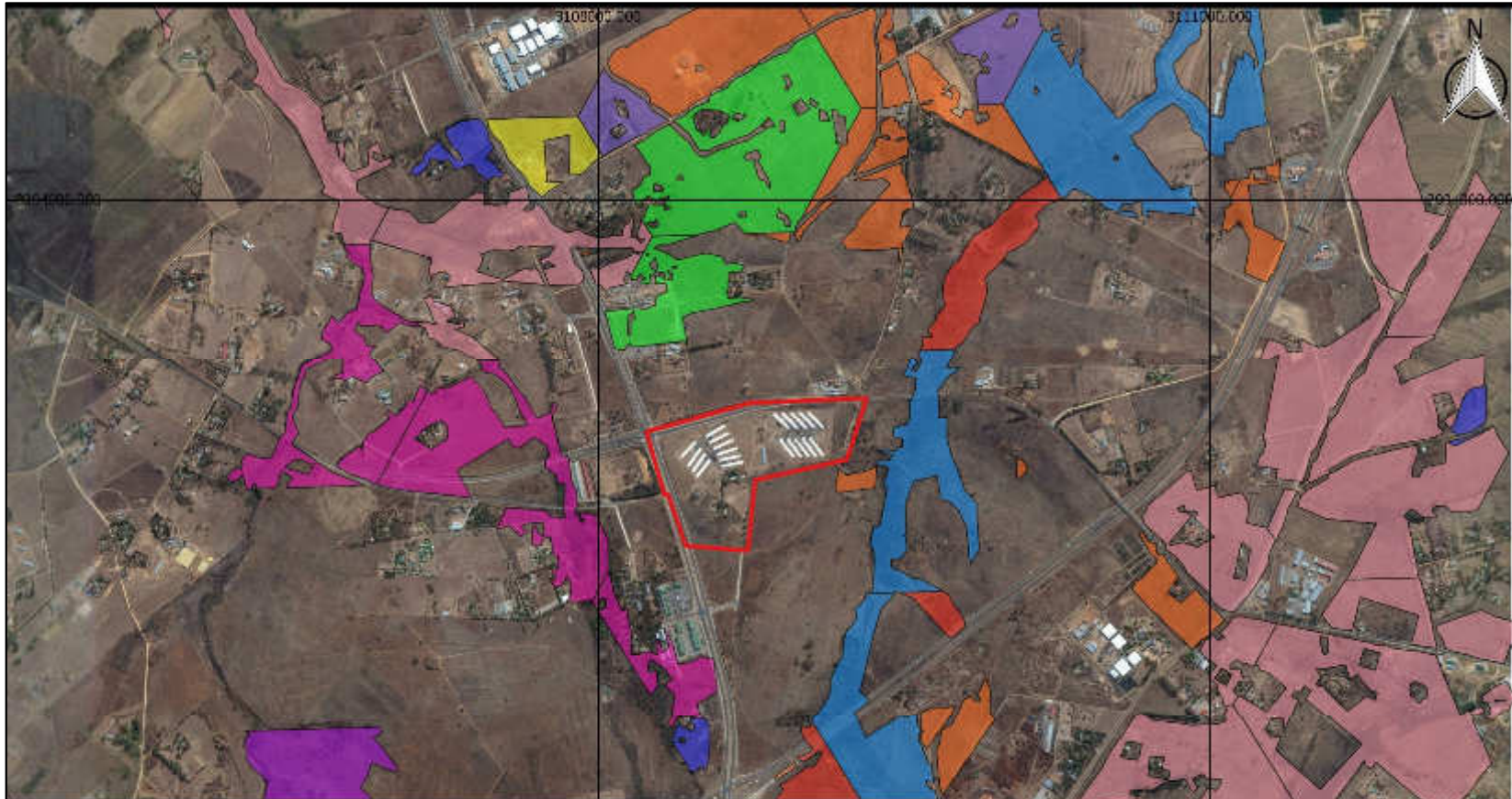


Legend
[Red Outline] Study Area

Projection - Transverse Mercator
Datum - Hartebeeshoek 1994
Reference Ellipsoid - WGS 1984
Central Meridian - 29

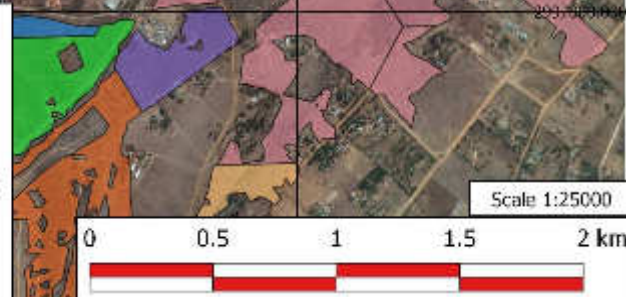
Lanseria X51

C Plan Irreplaceable



Legend

- | | |
|---------------------------------------|---|
| Lanseria X51 | Prim veg |
| C Plan Irreplaceable | RL bird hab, Prim veg |
| OL plant hab, Prim veg | RL plant hab, OL plant hab, Prim veg |
| OL plant hab, RL bird hab | RL plant hab, OL plant hab, RL bird hab, Biodlim zone, Prim veg |
| OL plant hab, RL bird hab, Prim veg | RL plant hab, OL plant hab, RL bird hab, Prim veg |
| OL plant hab, RL mammal hab, Prim veg | RL plant hab, OL plant hab, RL mammal hab, Prim veg |
| RL plant hab, Prim veg | |

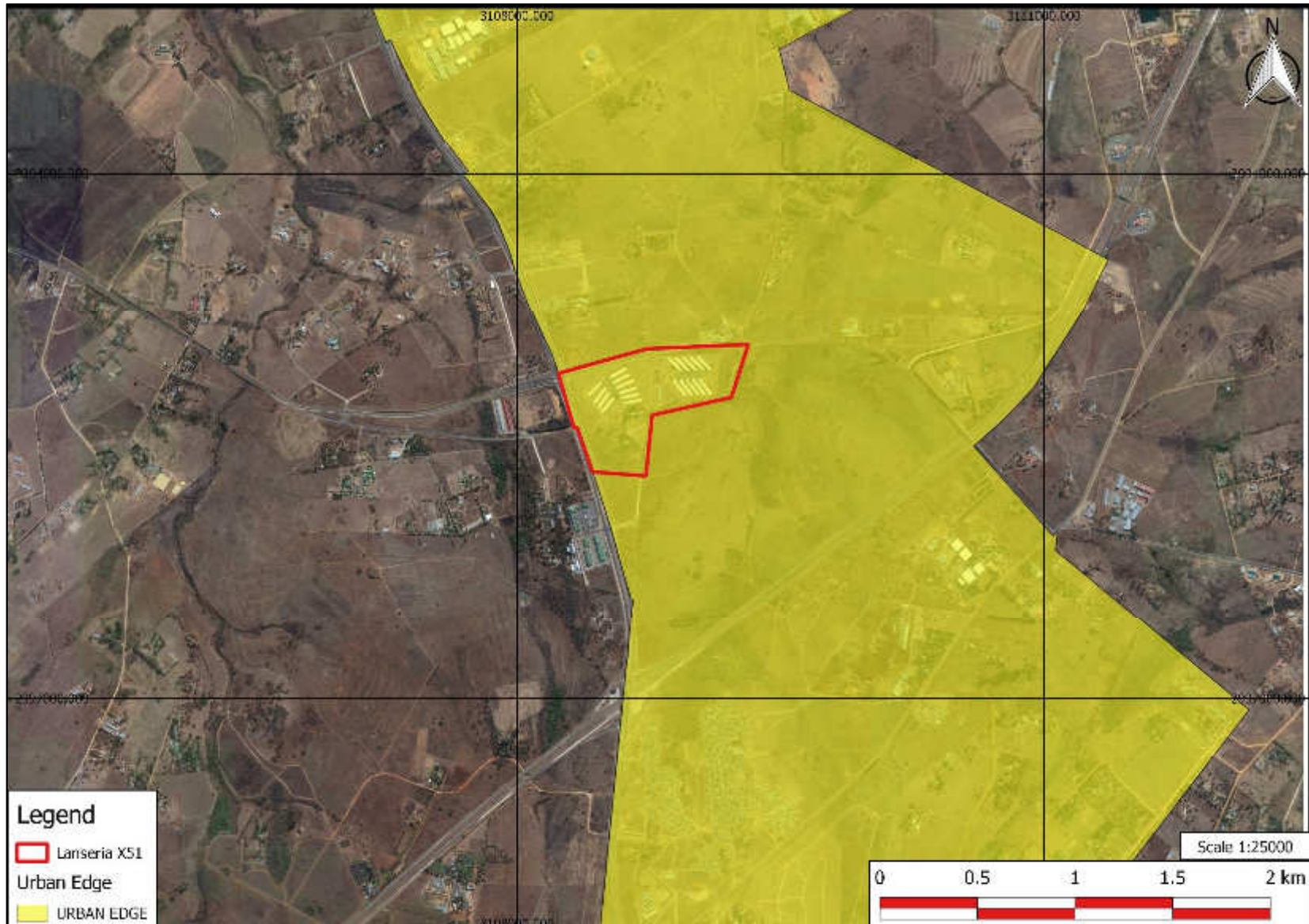


Projection - Transverse Mercator
 Datum - Hartebeeshoek 1994
 Reference Ellipsoid - WGS 1984
 Central Meridian -29

Bokamoso Environmental Consultants
Website: www.bokamoso.biz
E-Mail: Lizelleg@mweb.co.za

Lanseria X51

Urban Edge



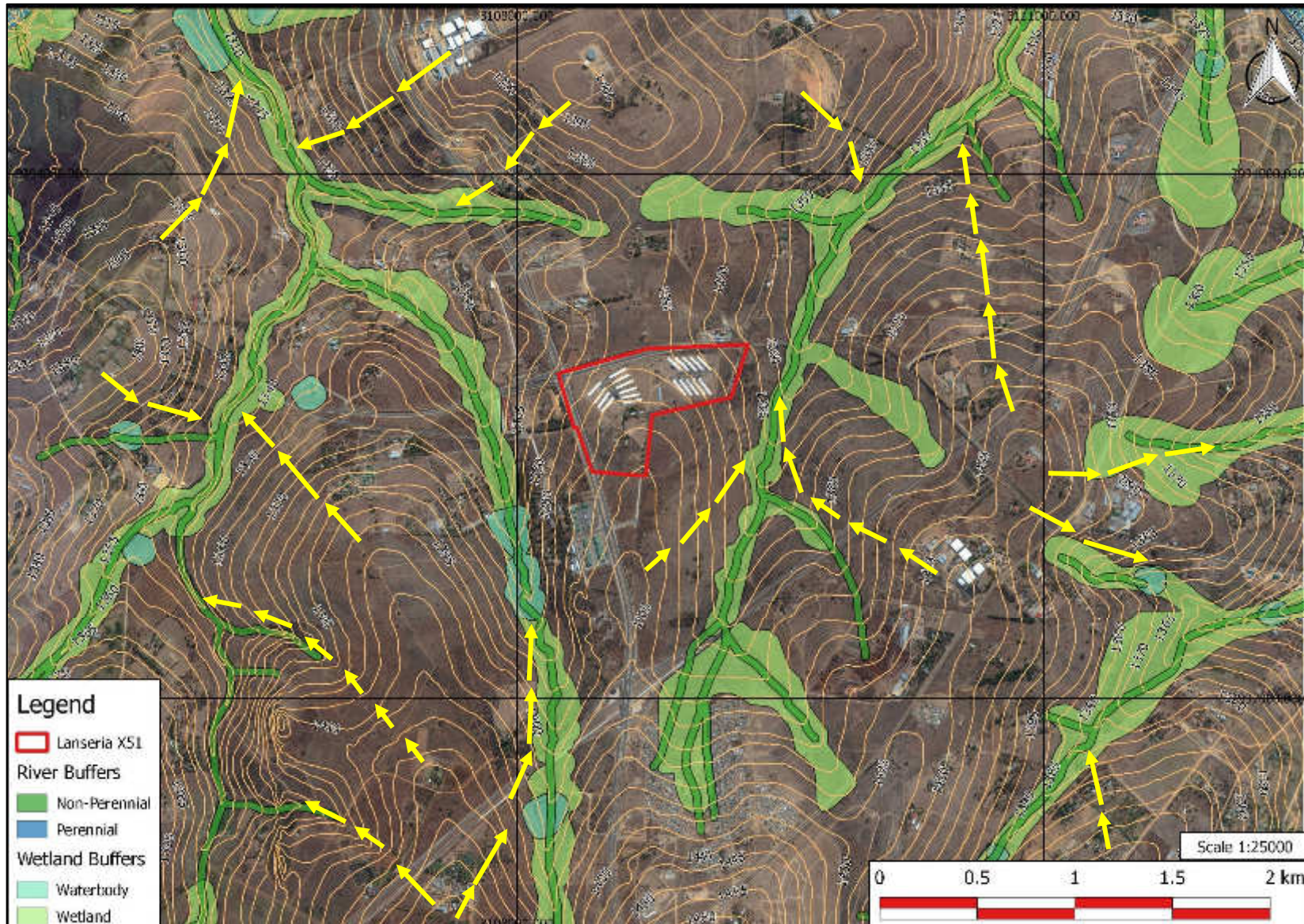
Legend

- Lanseria X51
- Urban Edge
- URBAN EDGE

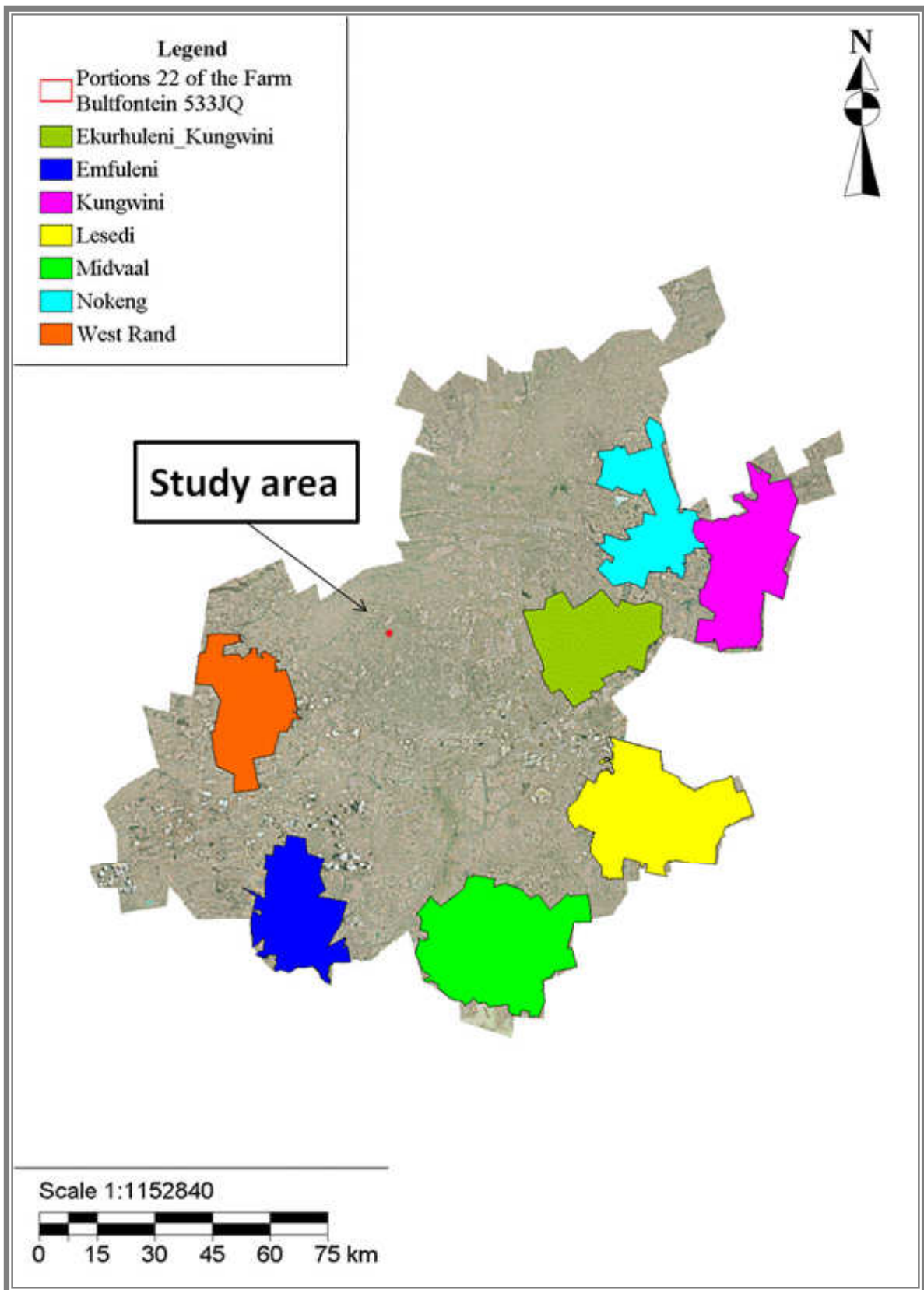
Projection - Transverse Mercator
Datum - Hartebeeshoek 1994
Reference Ellipsoid - WGS 1984
Central Meridian -29

Lanseria X51

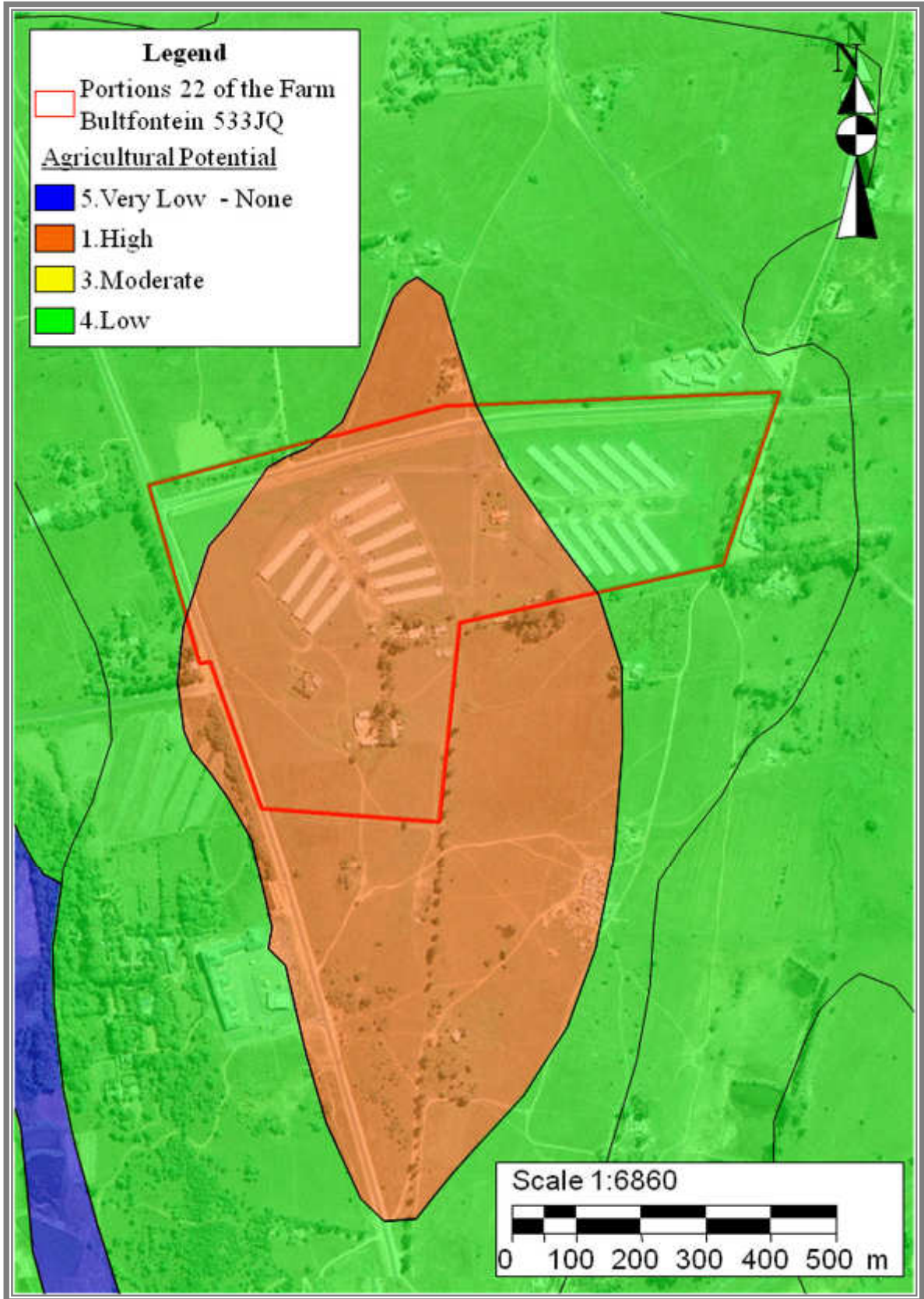
Hydrology



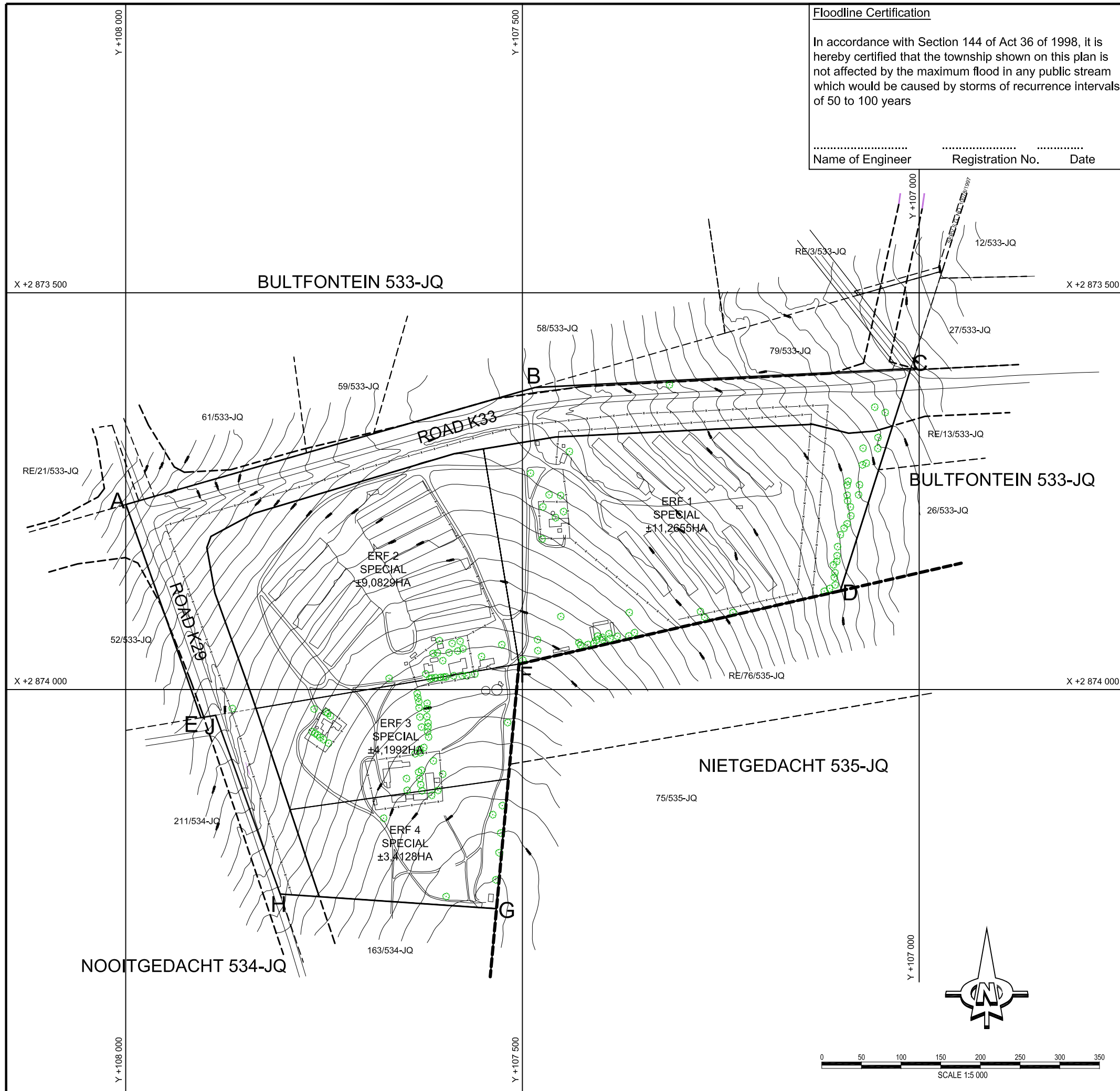
Projection - Transverse Mercator
Datum - Hartbeeshoek 1994
Reference Ellipsoid - WGS 1984
Central Meridian -29



Agricultural Hub Map



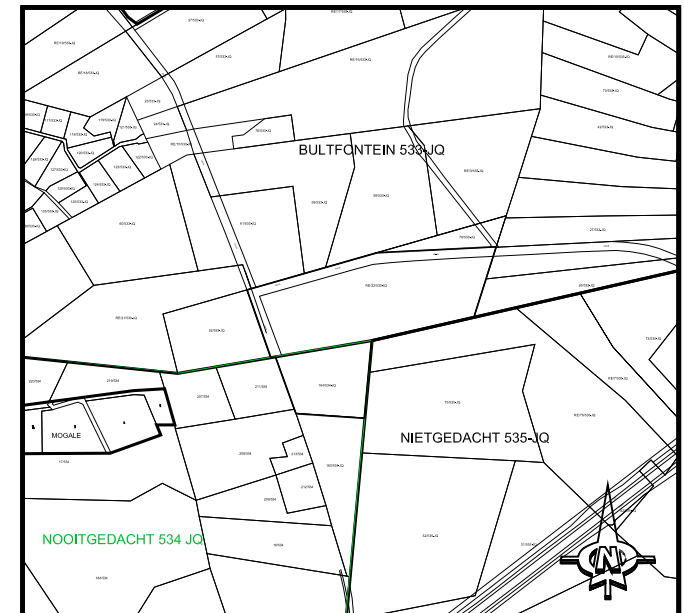
Agricultural Hub Potential



Floodline Certification

In accordance with Section 144 of Act 36 of 1998, it is hereby certified that the township shown on this plan is not affected by the maximum flood in any public stream which would be caused by storms of recurrence intervals of 50 to 100 years

.....
 Name of Engineer Registration No. Date



LOCALITY PLAN

TOWNSHIP DATA

| LAND-USE | No. OF ERVEN | ERF No'S | AREA (ha) | OF TOTAL AREA |
|---------------|--------------|----------|-------------------|----------------|
| SPECIAL ROADS | 4 | 1 TO 4 | 27,9604 8,8701 | 75,92 24,08 |
| TOTAL | 4 | | 36,8305 | 100,00 |

- NOTES**
- All areas and dimensions are approximate, being subject to final survey.
 - Contours are in accordance with the standards laid down in regulation 18(2) of the Town Planning and Townships (Ordinance 15, 1986)
 - Datum plane - Mean Sea Level; interval 1m
 - Co-ordinate system: WGS 84 Lo. 29°
 - The figure lettered **ABCDEA** represents the Remainder of Portion 22 Bultfontein 533 JQ, being 28,0283Ha in extent and the figure **FGHJF** represents Portion 164 Nooitgedacht 534 JQ, being 8,8022Ha in extent
 - The township falls under the jurisdiction of City of Johannesburg
 - Base plan information was obtained from

PROPOSED TOWNSHIP

LANSERIA

EXTENSION 51

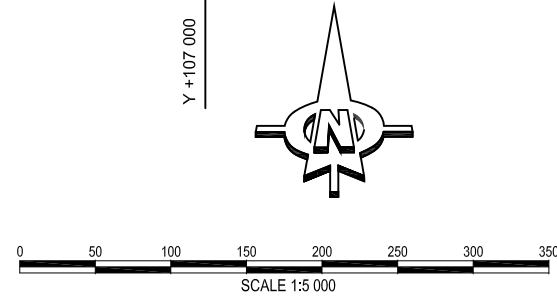
TO BE ESTABLISHED ON PORTION 164 NOOITGEDACHT 524 IQ AND THE REMAINDER OF PORTION 22 BULTFONTEIN 533 JQ

TINIE BEZUIDENHOUT AND ASSOCIATES
Town Planning Consultants

| | |
|---|---|
| Physical Address Unit 50, Thembi Place Office Park Calderwood Road Lone Hill | Postal Address P.O. Box 98558 Sloane Park 2152 |
|---|---|

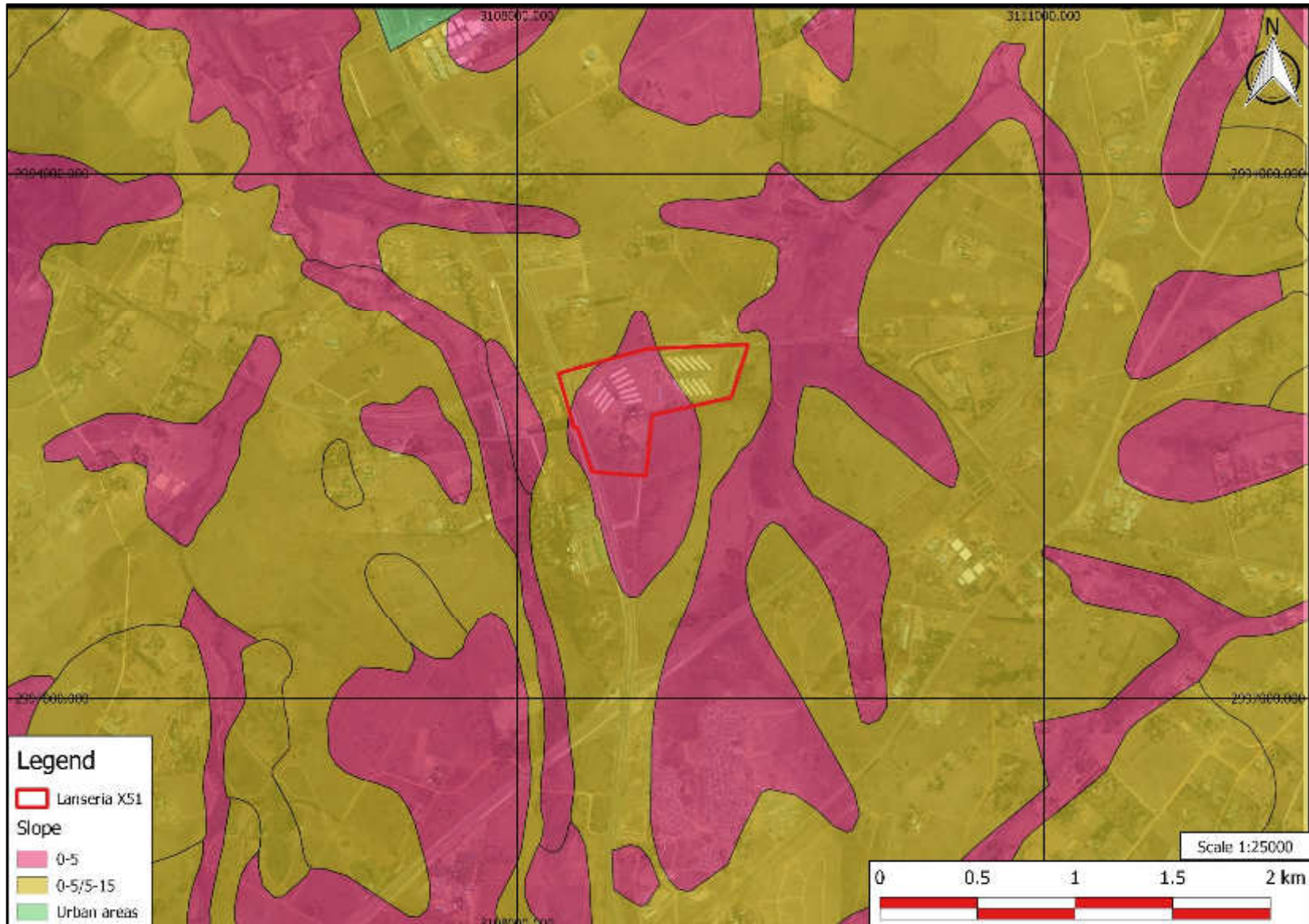
Phone (011) 467-1004 Telefax (011) 467-1170 e mail tiniebez@iafrica.com

DATE: 15 NOVEMBER 2010 PLAN NO. 7091/L1



Lanseria X51

Slope





Projection - Transverse Mercator
Datum - Hartebeeshoek 1994
Reference Ellipsoid - WGS 1984
Central Meridian -29


Lanseria X51

3D Visibility Map

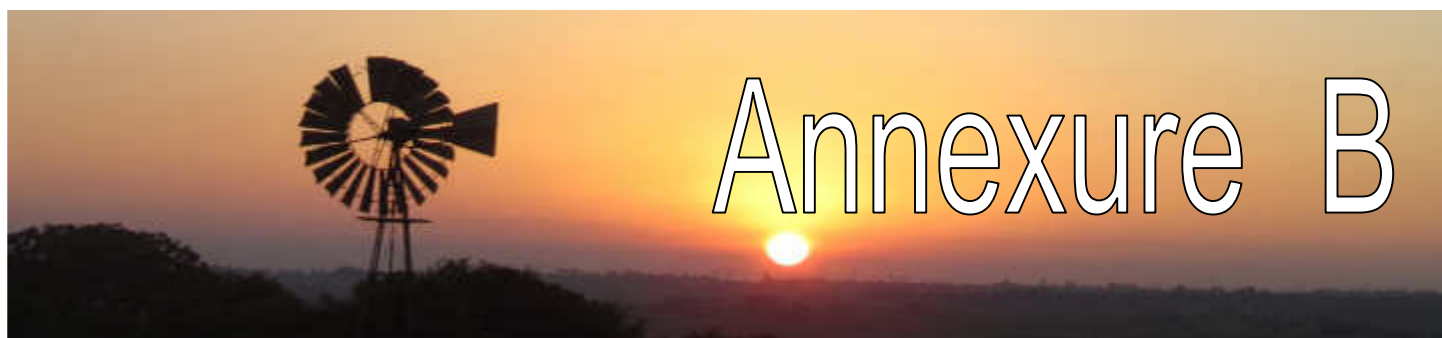


 Not Visible

 Partially Visible

 Full Visibility

Application Form



APPLICATION FORM [REGULATION 12 (1)&(2)(A)(B)(I)(II)]



Gauteng Department of Agriculture and Rural Development

Application for authorisation in terms of the National Environmental Management Act, 1988 (Act No. 107 of 1988), as amended and the Environmental Impact Assessment Regulations, 2010 (Version1)

Kindly note that:

1. This application form is to be completed for both the Basic Assessment process and the Scoping & EIA process.
2. This application form is current as of 2 August 2010. It is the responsibility of the EAP to ascertain whether subsequent versions of the form have been published or produced by the competent authority.
3. The application must be typed within the spaces provided in the form. The sizes of the spaces provided are not necessarily indicative of the amount of information to be provided. It is in the form of a table that can extend itself as each space is filled with typing.
4. Selected boxes must be indicated by a cross and, when the form is completed electronically, must also be highlighted.
5. Incomplete applications may be returned to the applicant for revision.
6. The use of "not applicable" in the report must be done with circumspection because if it is used in respect of material information that is required by the competent authority for assessing the application, it may result in the rejection of the application as provided for in the regulations.
7. Three copies of this form and the attachments must be handed in at the offices of the relevant competent authority as detailed below.
8. No faxed or e-mailed applications shall be accepted. Only hand delivered or posted applications will be accepted.
9. Unless protected by law, and clearly indicated as such, all information filled in on this application will become public information on receipt by the competent authority. The applicant/Environmental Assessment Practitioner (EAP) must provide any Interested and Affected Party (I&AP's) with the information contained in this application on request, during any stage of the application process.
10. Attachments, where applicable, to this document are to be ordered in the following prescribed manner

| | |
|--------------|--|
| Annexure - A | Locality map |
| Annexure - B | a) Proof of notification to the Land owner b) Proof of receipt of such notice by the owner |
| Annexure - C | List of all organs of state and State Departments of where the draft report will be submitted, their full contact details and contact person |

| | |
|--------------|---|
| Annexure - D | Property description list |
| Annexure - E | Current land use zonings list |
| Addendum-A | Declaration of Independence by EAP to be submitted with the report if the application form was submitted by applicant - |

DEPARTMENTAL DETAILS

Gauteng Department of Agriculture and Rural Development
Attention: Administrative Unit of the Sustainable Utilisation of the Environment (SUE) Branch
P.O. Box 8768
Johannesburg
2000

Administrative Unit of the Sustainable Utilisation of the Environment (SUE) Branch
18th floor Glen Cairn Building
73 Market Street, Johannesburg

Administrative Unit telephone number: (011) 355 1345
Department central telephone number: (011) 355 1900

APPLICATION FORM [REGULATION 12 (1)&(2)(A)(B)(I)(II)]

| | | | | | |
|-------------------------------|-------------------------|--|--|--|--|
| File Reference Number: | (For official use only) | | | | |
| Application Number: | | | | | |
| Date Received: | | | | | |

1. NATURE OF THE ACTIVITY

The proposed establishment of a mixed land use development to be known as **Portion 22 of the Farm Bultfontein 533JQ and Portion 164 of the Farm Nietgedacht 534 JQ** and associated infrastructure. The proposed development is situated to the east of the R512, north of the N14.

Select the appropriate box with regards to the application form submission

| | | | |
|---|-------------------------------------|---|--------------------------|
| An application for conducting a basic assessment (as defined in the regulations)? | <input type="checkbox"/> | A resubmission of an application for conducting a basic assessment (as defined in the regulations)? | <input type="checkbox"/> |
| An application for conducting a Scoping & EIA process (as defined in the regulations) | <input checked="" type="checkbox"/> | A resubmission of an application for conducting a SR & EIA process (as defined in the regulations) | <input type="checkbox"/> |

If this is a class application, has a copy of approval letter to undertake such an application been attached as such application may/shall not be undertaken without an approval from this Department

Has this project or a substantial similar project which has been previously submitted by the applicant been denied authorisation by the relevant authority in the last three (3) years

| | |
|-----|---|
| YES | NO <input checked="" type="checkbox"/> |
| YES | NO |

If yes will the application contain new or additional material not submitted previously
To be noted that Regulation 68 of EIA Regulations, 2010 states that no applicant may resubmit an application which is substantially similar to an application previously denied authorisation by the relevant authority unless 3 years has lapsed since the refusal or new material is to be presented

2. PROJECT DETAILS

Project title: Mixed Land-Use Development on Portion 22 of the Farm Bultfontein 533JQ and Portion 164 of the Farm Nietgedacht 534 JQ

To be noted that the project will be registered under this title and this title must be duplicated through the application life of the project

Local authority(ies) in whose jurisdiction the proposed application will fall City of Johannesburg Metro Municipality

3. ACTIVITY POSITION

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

Alternative:

| | |
|---|--|
| Latitude (S): | Longitude (E): |
| 25.969356 S | 27.82608 E |

In the case of linear activities:
Alternative:

- Starting point of the activity
- Middle point of the activity
- End point of the activity

| | |
|----------------------|-----------------------|
| Latitude (S): | Longitude (E): |
| | |
| | |
| | |

2

APPLICATION FORM [REGULATION 12 (1)&(2)(A)(B)(I)(II)]

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

Addendum of route alternatives attached

No

Property description:

Portion 22 of the Farm Buttsfontein 533JQ and Portion 164 of the Farm Nietgedacht 534 JQ

(Farm name, portion etc.) Where a large number of properties (including alternatives) are involved (e.g. linear activities), please attach a list of the property descriptions to this application.

4. ACTIVITIES APPLIED FOR

Describe the activity and associated infrastructure, which is being applied for, in detail

The proposed activity will entail the construction of a mixed land-use development consisting of the following land-uses: Residential dwelling units, Hotels, Educational, Medical and Social Facilities, Retail, Offices, Entertainment, Motor Trade, Municipal and Government Institutions and Commercial Industrial land-uses. The activity will also include the construction of infrastructure associated and required for the above mentioned land-uses.

Which Listing Notice is the activity(ies) listed under?

Listing Notice 1



Listing Notice 2



Listing Notice 3



If "or also" listed under Listing Notice 3, describe the Geographical Area triggering the activity and its regional, provincial, national & international significance

The proposed development site is situated in close proximity to a river as identified in terms of the Gonteng Conservation Plan. The activity is also situated in close proximity to irreplaceable sites.

An application may be made for more than one listed or specified activity that, together, make up one development proposal. All the listed activities that make up this application must be listed.

Please Note: The Activities applied for represent a preliminary list of potential activities that could be triggered. The list of activities applied for will however be finalized and motivated during the EIA phase. Additional activities identified during the course of the application process will be re-advertised during the EIA phase

| Indicate the number and date of the relevant Government Notice: | Activity No (s) (in terms of the relevant notice): e.g. Listing notices 1, 2 or 3 | Describe each listed activity as per the wording in the relevant listing notice: |
|---|---|---|
| Listing No. 1 R. 544, 18 June 2010 | Activity 9 | The construction of facilities or infrastructures exceeding 1000 metres in length for the bulk transportation of water, sewage or storm water- (i) with an internal diameter of 0,36 metres or more; or (ii) with a peak throughput of 120 litres per second or more, excluding where: (a) such facilities or infrastructures are for bulk transportation of water, sewage or storm water or storm water drainage inside a road reserve; or (b) where such construction will occur within urban areas but further than 32 metres from a watercourse, measured from the edge of the watercourse. |
| Listing No. 1 R. 544, 18 June 2010 | Activity 11 | The construction of: (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; (xi) infrastructures or structures covering 50 square metres or more 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. |
| Listing No. 1 R. 544, 18 June 2010 | Activity 18 | 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 |

APPLICATION FORM [REGULATION 12 (1)&(2)(A)(B)(1)(II)]

| | | |
|------------------------------------|-------------|---|
| | | <p>(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> <p>but excluding where such infilling, depositing, dredging, excavation, removal or moving</p> <p>(i) is for maintenance purpose undertaken in accordance with a management plan agreed to by the relevant environmental authority; or occurs behind the development setback line.</p> |
| Listing No. 1 R. 544, 18 June 2010 | Activity 28 | The expansion of existing facilities for any process or activity where such expansion will result in the need for a new, or amendment of, any existing permit or license in terms of national or provincial legislation governing the release of emission pollution, excluding where the facility, process or activity is 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 that Act will apply. |
| Listing No. 2 R. 545, 18 June 2010 | Activity 15 | Physical alteration of undeveloped land, 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; |
| Listing No. 2 R. 545, 18 June 2010 | Activity 18 | <p>Except where such physical alterations takes place for:</p> <p>(i) linear development activities; or</p> <p>(ii) agricultural or afforestation where activity 16 in this Schedule will apply.</p> <p>The route determination of roads and designs of associated physical infrastructure, including roads that have not yet been built for which routes have been determined before 03 July 2006 and which have not been authority in terms of the Environmental Impact Assessment Regulations, 2006 or 2009, made under section 24(5) of the Act and published in Government Notice No. R385 of 2006, -</p> <p>(i) it is a national road as defined in section 40 of the South African Roads Agency Limited and National Roads Act, 1998 (Act No. 7 of 1998);</p> <p>(ii) it is a road administered by a provincial authority;</p> <p>(iii) the road reserve is wider than 30 metres; or</p> <p>(iv) the road will cater for more than one lane of traffic in both directions.</p> |
| Listing No. 3 R. 546, 18 June 2010 | Activity 4 | <p>The construction of a road wider than 4 metres with a reserve less than 13,5 metres.</p> <p>(b) In Gauteng:</p> <p>i. A protected area identified in terms of NEMPAA, excluding conservancies;</p> <p>ii. National Protected Area Expansion Strategy Focus areas;</p> <p>iii. Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act as adopted by the competent authority;</p> <p>iv. Sites or areas identified in terms of the Ramsar Convention;</p> <p>v. Sites identified as irreplaceable or important in the Gauteng Conservation plan;</p> <p>vi. Areas larger than 2 hectares zoned for use as public open space;</p> <p>vii. Areas zoned for conservation purpose;</p> <p>viii. Any declared protected area including Municipal or Provincial Nature Reserves as contemplated by the Environmental Conservation Act, 1989 (Act No. 73 of 1989) and the Nature Conservation Ordinance (Ordinance 12 of 1983);</p> <p>ix. 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> |
| Listing No. 3 R. 546, 18 June 2010 | Activity 6 | <p>The construction of resorts, lodges or other tourism accommodation facilities that sleeps 15 people or more.</p> <p>(b) In Gauteng:</p> <p>i. A protected area identified in terms of NEMPAA, excluding conservancies;</p> <p>ii. National Protected Area Expansion Strategy Focus areas;</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</p> |

APPLICATION FORM [REGULATION 12 (1)&(2)(A)(B)(I)(II)]

| | | | |
|------------------------------------|-------------|---|--|
| | | | <p>competent authority;</p> <p>iv. Sites or areas identified in terms of an International Convention</p> <p>v. Sites identified as irreplaceable or important in the Gauteng Conservation plan;</p> <p>vi. Within 100 metres of from the edge of a watercourse;</p> <p>vii. Any site identified as land with high agricultural potential located within the Agricultural Hubs or Important Sites identified in terms of the Gauteng Agricultural Potential Atlas, 2006.</p> |
| Listing No. 3 R. 546, 18 June 2010 | Activity 13 | <p>The clearance of an area of 1 hectare or more of vegetation where 75% or more of the vegetation cover constitutes indigenous vegetation, except where such removal of vegetation is required for:</p> <p>(1) The undertaking of a process or activity included in the list of waste management activities published in terms of section 19 of the National Management Act, 2008 (Act No. 68 of 2008) in which case the activity is regarded to be excluded from this list.</p> <p>(2) The undertaking of a linear activity falling below the thresholds mentioned in Listing Notice 1 in terms of GN No. 544 of 2010</p> | <p>(d) In Gauteng:</p> <p>i. A protected area identified in terms of NEMPAA, excluding conservancies;</p> <p>ii. National Protected Area Expansion Strategy Focus areas;</p> <p>iii. Any declared protected area including Municipal or Provincial Nature reserves as contemplated by the Environmental Conservation Act, 1989 (Act No. 73 of 1989), the Nature Conservation Ordinance (Ordinance 12 of 1983);</p> <p>iv. 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>v. Sites or areas identified in terms of an International Convention</p> <p>vi. Sites identified as irreplaceable or important in the Gauteng Conservation plan;</p> |
| Listing No. 3 R. 546, 18 June 2010 | Activity 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>(b) In Gauteng:</p> <p>i. A protected area identified in terms of NEMPAA, excluding conservancies;</p> <p>ii. National Protected Area Expansion Strategy Focus areas;</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 the Gauteng Conservation plan;</p> <p>vii. Any declared protected area including Municipal or Provincial Nature reserves as contemplated by the Environmental Conservation Act, 1989 (Act No. 73 of 1989), the Nature Conservation Ordinance (Ordinance 12 of 1983) and the NEMPAA.</p> |

Please note that any authorisation that may result from this application will only cover activities specifically applied for.

APPLICATION FORM [REGULATION 12 (1)&(2)(A)(B)(I)(II)]

5. OTHER AUTHORISATIONS REQUIRED

5.1 DO YOU NEED ANY AUTHORISATIONS IN TERMS OF ANY OF THE FOLLOWING LAWS?

- 4.1.1 National Environmental Management: Waste Act
- 4.1.2 National Environmental Management: Air Quality Act
- 4.1.3 National Environmental Management: Protected Areas Act
- 4.1.4 National Environmental Management: Biodiversity Act
- 4.1.5 Mineral Petroleum Development Resources Act
- 4.1.6 National Water Act
- 4.1.7 National Heritage Resources Act
- 4.1.8 Other (please specify)
- 4.2 Have such applications been lodged already?

| | | |
|-------------------------------------|-----|---|
| <input type="checkbox"/> | No | X |
| <input type="checkbox"/> | No | X |
| <input checked="" type="checkbox"/> | Yes | X |
| <input checked="" type="checkbox"/> | Yes | X |
| <input type="checkbox"/> | No | X |
| <input checked="" type="checkbox"/> | Yes | X |
| <input checked="" type="checkbox"/> | Yes | X |
| <input type="checkbox"/> | No | X |
| <input type="checkbox"/> | No | X |

6. BACKGROUND INFORMATION

Project applicant:
Trading name (if any):
Contact person:
Physical address:
Postal address:
Postal code:
Telephone:
E-mail:

| | | |
|--|-------|--------------|
| Extension 24 Commercial Leasing Co (Pty) Ltd | | |
| As Above | | |
| Chris Harris | | |
| 1 st Floor NW Block, 5 Wespeels Rd, Rivonia, 2128 | | |
| PO Box 851088, Benmore | | |
| 2010 | Cell: | 083 378 1886 |
| 011 803 9233 | Fax: | 011 803 8580 |
| chris@syndev.co.za | | |

Project Environmental Assessment Practitioner:
Contact person:
Postal address:
Postal code:
Telephone:
E-mail:
EAP qualifications & relevant experience

| | | |
|--|-------|--------------|
| Bokamoso Landscape CC. T/A Bokamoso Landscape Architects and Environmental Consultants | | |
| Mrs. Lizelle Gregory | | |
| P.O. Box 11375, Marolana | | |
| 0161 | Cell: | 983 285 8384 |
| 012 348 3810 | Fax: | 884 870 5580 |
| lizelleg@rweb.co.za | | |

Professional affiliation(s) (if any)

| |
|--|
| Registered Landscape Architect and Environmental Consultant (degree obtained at the University of Pretoria) with 17 years experience in the following fields: |
| <ul style="list-style-type: none"> • Environmental Planning and Management; • Landscape Architecture; and • Landscape Contracting |
| L. Gregory also lectured at the Tshwane University Technology and the University of Pretoria. |
| Lizelle Gregory is a registered member of the South African Council of the Landscape Architects Profession (SACLAP), the International Association of Impact Assessments (IAIA), and The Institute for Landscape Architects south Africa (ILASA) and the Institute of Environmental Management and Assessment (IEMAS). |
| Her professional practise number is: 07078 |

Landowner:
Contact person:
Postal address:
Postal code:
Telephone:
E-mail:

| | | |
|---|-------|--------------|
| Extension 24 Commercial Leasing Co. (Pty) Ltd | | |
| Chris Harris | | |
| PO Box 851088, Benmore | | |
| 2010 | Cell: | 083 378 1886 |
| 0118039233 | Fax: | 0118038580 |
| chris@syndev.co.za | | |

In instances where there is more than one landowner (including for alternative sites), please attach a list of landowners with their contact details to this application.

In instances where the landowner is not the applicant –attach proof of notification of the landowner and a proof of receipt of such notice by the owner, manager or person in control of the land.

| | |
|---|----|
| List of the land owner is attached | No |
| Landowner notification proof is attached | No |
| Landowner proof of receipt of such notification is attached | No |

APPLICATION FORM [REGULATION 12 (1)&(2)(A)(B)(I)(II)]

Local authority in whose jurisdiction the proposed activity will fall:

| | |
|---|-------------------|
| City of Johannesburg Metro Municipality | |
| Flora Mokgohloa | |
| P.O Box 1049, Johannesburg | |
| Postal code: 2000 | Cell: |
| Telephone: 011 407 6750 | Fax: 611 339 1885 |
| E-mail: floram@joburg.org.za | |

In instances where there is more than one local authority involved (including for alternative sites), please attach a list of local authorities with their contact details to this application.

List of local authorities is attached No

List of properties is attached No

Town(s) or district(s):
Street/Physical address:

| |
|---|
| City of Johannesburg Metro Municipality |
| Braamfontein, Johannesburg |

In instances where there is more than one town or district involved, please attach a list of towns or districts to this application.

List of towns or districts is attached No

State Departments administering a law affecting the environment:
Contact person:
Postal address:
Postal code:
Telephone:
E-mail:

| | |
|-----------------------------|-------|
| List attached as Annexure E | |
| | |
| | Cell: |
| | Fax: |

In instances where there is more than one State Department involved, please attach a list of all State Departments with their contact details.

Current land-use zoning:

| |
|----------------|
| "Agricultural" |
|----------------|

In instances where there is more than one current land-use zoning (including alternatives), please attach a list of current land use zonings that also indicate which portions each use pertains to, to this application.

List of current land use zonings is attached No

Locality map:

A locality map(s) (including alternatives) must be attached to the back of this document, as Annexure A. The scale of the locality map must be between 1:10 000 and 1:50 000. The scale must be indicated on the map. The map must indicate the following:

- an accurate indication of the project site position as well as the positions of the alternative sites, if any;
- road access from all major roads in the area;
- road names or numbers of all major roads as well as the roads that provide access to the site(s);
- all roads within a 1km radius of the site or alternative sites;
- all rivers within a 1km radius of the site or alternative sites; and
- a north arrow.

APPLICATION FORM [REGULATION 12 (1)&(2)(A)(B)(I)(II)]

7. COMPLIANCE WITH CONDITIONS

Have you ever been in non-compliance with a condition of an authorisation or exemption issued by this Department or any other provincial or national environmental department in terms of the Environment Conservation Act (No 73 of 1989) or the National Environmental Management Act (No 107 of 1998) as amended?

| | |
|-----|----|
| YES | NO |
| | X |

If yes, indicate details of non-compliance together with reasons for non-compliance:

Attach all relevant documentation e.g. compliance audit reports, pre-directives, directives, compliance notices

8. ACTIVITY INFORMATION

Socio-economic value of the activity

What is the expected capital value of the activity on completion?

What is the expected yearly income that will be generated by or as a result of the activity?

Will the activity contribute to service infrastructure?

Will the activity contribute to a public amenity?

Total number of new employment opportunities to be created in the development phase of this activity.

Of these opportunities how many are:

Women

People with disabilities

Female

Male

Youth

Female

Male

What is the expected value of the employment opportunities during the development phase?

What percentage of this will accrue to previously disadvantaged individuals?

Total number of new employment opportunities to be created in the operational phase of this activity.

Of these opportunities how many are:

Women

People with disabilities

Female

Male

Youth

Female

Male

What is the expected current value of the employment opportunities during the first 10 years?

What percentage of this will accrue to previously disadvantaged individuals?

| | |
|----------------------|----|
| R200 Million | |
| Not known at present | |
| YES | NO |
| X | |
| YES | NO |
| X | |
| 220 | |
| 132 | |
| 2 | |
| 2 | |
| 40 | |
| 27 | |
| R72 million | |
| 85% | |
| 100 | |
| 60 | |
| 10 | |
| 5 | |
| 5 | |
| 10 | |
| 5 | |
| 5 | |
| Not known at present | |
| Not known at present | |

Need and desirability of the activity

Motivate and explain the need and desirability of the activity (including demand for the activity):

The overall housing and commercial facilities need can be seen in the greater context of the larger Johannesburg environment. The proposed development is not in conflict to the strategic planning proposal in place for this area. The current land use is however zoned "agricultural" but is in close proximity to Lanseria airport which is earmarked for development in the vicinity.

Indicate any benefits that the activity will have for society in general:

The residential and commercial developments form part of the larger Lanseria airport development. The integration of residential units with a commercial development in proximity to the airport will have a twofold positive impact on the society in general. The development will promote the live/work concept where

APPLICATION FORM [REGULATION 12 (1)&(2)(A)(B)(I)(II)]

individuals live where they work and in such a way promote a healthier environment. This mixed use development will feed individuals living there to the airport as well as the offices proposed within the development.

Indicate any benefits that the activity will have for the local communities where the activity will be located:

Development, when adequately determined gives way to commercial growth. The mixed use development will give way to job opportunities to the surrounding rural areas such as Diepsloot which is situated within 10km of the proposed development.

APPLICATION FORM [REGULATION 12 (1)&(2)(A)(B)(1)(II)]

9. DECLARATIONS

The Applicant

I, Chris Harris, on behalf of Extension 24 Commercial Leasing Co (Pty) Ltd, declare that I:

- am¹, the applicant in this application for Mixed Land-Use Development on Portion 22 of the Farm Bultfontein 538JQ and Portion 164 of the Farm Nietgedacht 534 JQ
- have appointed an environmental assessment practitioner to act as the independent environmental assessment practitioner for this application;
- will provide the environmental assessment practitioner and the competent authority with access to all information at my disposal that is relevant to the application;
- will be responsible for the costs incurred in complying with the Environmental Impact Assessment Regulations, 2010, including but not limited to -
 - costs incurred in connection with the appointment of the environmental assessment practitioner or any person contracted by the environmental assessment practitioner;
 - costs incurred in respect of the undertaking of any process required in terms of the Regulations;
 - costs in respect of any fee prescribed by the Minister or MEC in respect of the Regulations;
 - costs in respect of specialist reviews, if the competent authority decides to recover costs; and
 - the provision of security to ensure compliance with conditions attached to an environmental authorisation, should it be required by the competent authority;
- will ensure that the environmental assessment practitioner is competent to comply with the requirements of these Regulations and will take reasonable steps to verify whether the EAP complies with the Regulations;
- will inform all registered interested and affected parties of any suspension of the application as well as of any decisions taken by the competent authority in this regard;
- am responsible for complying with the conditions of any environmental authorisation issued by the competent authority;
- hereby indemnify the Government of the Republic, the competent authority and all its officers, agents and employees, from any liability arising out of the content of any report, any procedure or any action which the applicant or environmental assessment practitioner is responsible for in terms of these Regulations;
- will not hold the competent authority responsible for any costs that may be incurred by the applicant in proceeding with an activity prior to obtaining an environmental authorisation or prior to an appeal being decided in terms of these Regulations;
- will perform all other obligations as expected from an applicant in terms of the Regulations;
- all the particulars furnished by me in this form are true and correct; and
- I am aware that a false declaration is an offence in terms of regulation 71 and is punishable in terms of section 24F of the Act.



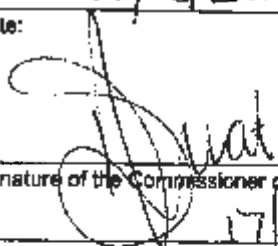
Signature of the applicant:

Extension 24 Commercial Leasing Co (Pty) Ltd.

Name of company (if applicable):

17/09/2011

Date:



Signature of the Commissioner of Oaths:

17/8/2011

Date:

Designation:

Commissioner of Oaths Official stamp (below)

GESERTIFISEER 'N WARE AFSKRIF
VAN DIE OORSPRONKLIKE
CERTIFIED A TRUE COPY OF THE ORIGINAL

ANISWART

Commissioner of Oaths Kommissaris van Ede
Professionele Rekenmeester (SAIPA). Lid no : 8146
Chris Hougaardstr 262. Wierdapark. 0140

¹ If this is signed on behalf of the applicant, proof of such authority from the applicant must be attached.

ADDENDUM A

10. DECLARATIONS²

The Environmental Assessment Practitioner;

- I, Lizelle Gregory, declare under oath that I –
- I act as the Independent environmental practitioner for this application 'Mixed Land-Use Development on Portion 22 of the Farm Bulfontein 533 JQ and Portion 164 of the Farm Metgedacht 534 JQ
 - I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
 - I declare that there are no circumstances that may compromise my objectivity in performing such work;
 - I have expertise in conducting environmental impact assessments, including knowledge of the Act, regulations and any guidelines that have relevance to the proposed activity;
 - I will comply with the Act, regulations and all other applicable legislation;
 - I will take into account, to the extent possible, the matters listed in regulation 5 of the regulations when preparing the application and any report relating to the application;
 - I have no, and will not engage in, conflicting interests in the undertaking of the activity;
 - I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
 - I will ensure that information containing all relevant facts in respect of the application is distributed or made available to interested and affected parties and the public and that participation by interested and affected parties is facilitated in such a manner that all interested and affected parties will be provided with a reasonable opportunity to participate and to provide comments on documents that are produced to support the application;
 - I will ensure that the comments of all interested and affected parties are considered and recorded in reports that are submitted to the competent authority in respect of the application, provided that comments that are made by interested and affected parties in respect of a final report that will be submitted to the competent authority may be attached to the report without further amendment to the report;
 - I will keep a register of all interested and affected parties that participated in a public participation process; and
 - I will provide the competent authority with access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not
 - all the particulars furnished by me in this form are true and correct;
 - will perform all other obligations as expected from an environmental assessment practitioner in terms of the Regulations; and
 - I realise that a false declaration is an offence in terms of regulation 71 and is punishable in terms of section 24F of the Act.

For Scoping/ EIA applications I further declare under oath that

- I will fix the site notice(s) in a conspicuous place, on the property(ies) where it is intended to undertake the activity(ies)
- I will place a notice in the required newspaper(s)
- I will provide the following with all the project information and give I&AP's an opportunity to register as an I&AP
 - landowners and occupiers of adjacent land
 - landowners and occupiers of land within 100 metres of the boundary of the property
 - the ward councillor
 - any organisation that represents the community in the area of the application
 - the municipality which has jurisdiction over the area in which the proposed activity will be undertaken
 - any organ of state that may have jurisdiction over any aspect of the activity of the applicant's intention to submit an application to the competent authority; and
- I will include on the register all persons as required per Regulation 65 (1) (c)
- The Reports as submitted will contain the same information (including layout, project design and mitigation) as provided to the registered I&APs for comment
- All issues raised by the I&APs during the public participation process will be included in the Comments and Response Report as attached

² Addendum A must be completed and submitted with the report if application form was done and submitted by the applicant.

APPLICATION FORM [REGULATION 12 (1)&(2)(A)(B)(I)(II)]


Signature of the Environmental Assessment Practitioner:

Bokamosa

Name of company:

Date:

17/08/2011


Signature of the Commissioner of Oaths:

Date:

17/8/2011

Designation:

Commissioner of Oaths Official stamp (below)

11. CHECKLIST

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

- > Where requested, supporting documentation has been attached;
- > All relevant sections of the form have been completed; and
- > The form has been signed by the applicant, by the EAP or both.

GESERTIFISEER 'N WARE AFSKRIF
VAN DIE OORSPRONKLIKE
CERTIFIED A TRUE COPY OF THE ORIGINAL


AR SWART

Commissioner of Oaths/Kommissaris van Ede
Professionele Rekenmeester (SAIPA), Lid no : 8140
Chris Hougaardstr 262, Wierdapark, C149



Company Profile & CV of Lizelle Gregory (Environmental Assessment Practitioner)



Qualifications And Experience In The Field Of Environmental Planning And Management (Lizelle Gregory (Member Bokamoso)):

Qualifications:

- Qualified as **Landscape Architect** at UP 1991;
- Qualified as **Professional Landscape Architect in 1997**;
- A Registered Member at The **South African Council for the Landscape Architect Profession (SACLAP)** with Practise Number: **PrLArch97078**;
- A Registered Member at the **International Association for Impact Assessment Practitioners (IAIA)**;
- Qualified as an **Environmental Auditor in July 2008** and also became a Member of the International Environmental Management Association (IEMAS) in 2008.

Working Experience:

- Worked part time at Eco-Consult – 1988-1990;
- Worked part time at **Plan Associates as Landscape Architect in training** – 1990-1991;
- Worked as Landscape Architect at **Environmental Design Partnership (EDP)** from 1992 - 1994
- Practised under **Lizelle Gregory Landscape Architects** from 1994 until 1999;
- Lectured** at Part-Time at **UP** (1999) – Landscape Architecture and **TUT** (1998- 1999)- Environmental Planning and Plant Material Studies;
- Worked as **part time Landscape Architect and Environmental Consultant at Plan Associates** and **managed their environmental division for more than 10 years** – 1993 – 2008 (assisted the **PWV Consortium** with various road planning matters which amongst others included environmental Scans, EIA's, Scoping reports etc.)
- Renamed business as **Bokamoso in 2000** and is the only member of Bokamoso Landscape Architects and Environmental Consultants CC;
- More than 20 years experience in the compilation of Environmental Reports**, which amongst others included the compilation of various **DFA Regulation 31 Scoping Reports**, EIA's for EIA applications in terms of the applicable environmental legislation, Environmental Management Plans, Inputs for Spatial Development Frameworks, DP's, EMF's etc. Also included EIA Application on and adjacent to mining land and slimes dams (i.e. Brahm Fisherville, Doornkop)

Qualifications And Experience In The Field Of Landscape Architecture (Lizelle Gregory (Member Bokamoso)):

Landscape Architecture:

-Compiled landscape and rehabilitation plans for more than 22 years.

The most significant landscaping projects are as follows:

-Designed the Gardens of the Witbank Technicon (a branch of TUT). Also supervised the implementation of the campus gardens (2004);

-Lizelle Gregory was the Landscape Architect responsible for the paving and landscape design at the UNISA Sunnyside Campus and received a Corobrick Golden Award for the paving design at the campus (1998-2004);

-Bokamoso assisted with the design and implementation of a park for the City of Johannesburg in Tembisa (2010);

-The design and implementation of the landscape gardens (indigenous garden) at the new Coca-Cola Valpre Plant (2012-2013);

-Responsible for the rehabilitation and landscaping of Juksei River area at the Norwood Shopping Mall (Johannesburg) (2012-2013);

-Designed and implemented a garden of more than 3,5ha in Randburg (Mc Arthurpark). Bokamoso also seeded the lawn for the project (more than 2,5 ha of lawn successfully seeded) (1999);

-Bokamoso designed and implemented more than 800 townhouse complex gardens and submitted more than 500 Landscape Development Plans to CTMM for approval (1995 – 2013);

-Assisted with Landscape Designs and the Masterplan at Eco-Park (M&T Developments) (2005-2011);

-Bokamoso designed and implemented an indigenous garden at an office park adjacent to the Bronberg. In this garden it was also necessary to establish a special garden for the Juliana Golden Mole. During a recent site visit it was established that the moles are thriving in this garden. Special sandy soils had to be imported and special indigenous plants had to be established in the natural section of the garden.

-Lizelle Gregory also owns her own landscape contracting business. **For the past 20 years she trained more than 40 PDI jobless people (sourced from a church in Mamelodi)** to become landscape contracting workers. All the workers are (on a continuous basis) placed out to work at nurseries and other associated industries;

-Over the past 20 years the Bokamoso team compiled more than 800 landscape development plans and also implemented most of the gardens. Bokamoso also designed and implemented the irrigation for the gardens (in cases where irrigation was required). Lizelle regarded it as important to also obtain practical experience in the field of landscape implementation.



Bokamoso

**Landscape Architects &
Environmental consultants**

**P.O.BOX 11375
Maroelana
0161**

**Tel: (012) 346 3810
Fax: (086) 570 5559**

**E-mail: lizelle@mweb.co.za
Website: www.bokamoso.biz**

- 01** Executive Summary
- 02** Vision, Mission & Values
- 03** Human Resources
- 04** Services
- 05** Landscape Projects
- 06** Corporate Highlights
- 07** Environmental Projects
- 08** Indicative Clients
- 09** Tools

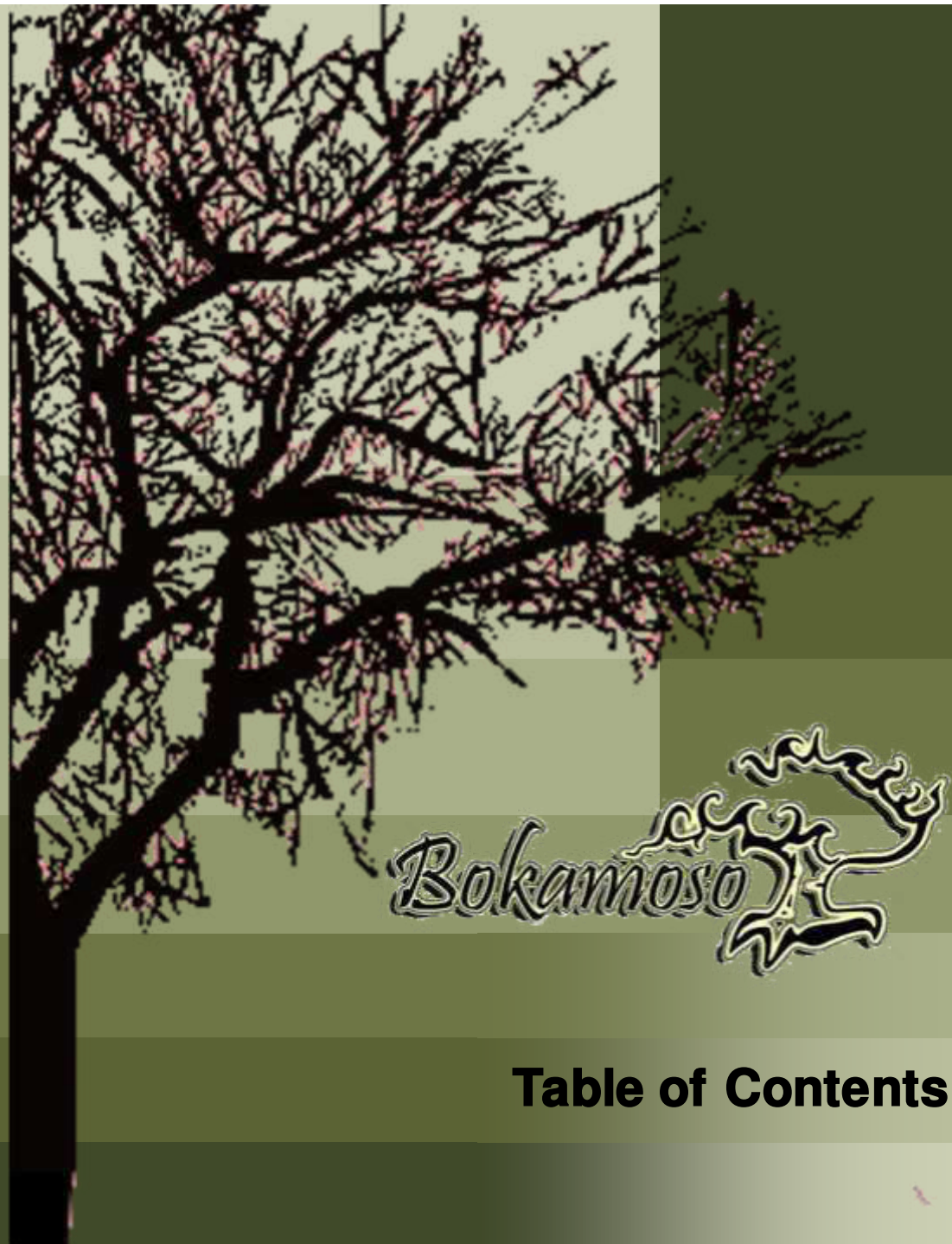


Table of Contents

Bokamoso specialises in the fields of Landscape Architecture and all aspects of Environmental Management and Planning. Bokamoso was founded in 1992 and has shown growth by continually meeting the needs of our clients. Our area of expertise stretches throughout the whole of South Africa. Our projects reflect the competence of our well compiled team. The diversity of our members enables us to tend to a variety of needs. Our integrated approach establishes a basis for outstanding quality. We are well known to clients in the private, commercial as well as governmental sector.

At Bokamoso we stand on a firm basis of environmental investigation in order to find unique solutions to the requirements of our clients and add value to their operations.



01 Executive Summary

011 Company Overview



Vision:

At Bokamoso we strive to find the best planning solutions by taking into account the functions of a healthy ecosystem. Man and nature should be in balance with each other.

Mission:

We design according to our ethical responsibility, take responsibility for successful completion of projects and constitute a landscape that contributes to a sustainable environment. We add value to the operations of our clients and build long term relationships that are mutually beneficial.

Values:

Integrity

Respect



Bokamoso stands on the basis of fairness. This include respect within our multicultural team and equal opportunities in terms of gender, nationality and race.

We have a wide variety of projects to tend to, from complicated reports to landscape installation. This wide range of projects enables us to combine a variety of professionals and skilled employees in our team.

Bokamoso further aids in the development of proficiency within the working environment. Each project, whether in need of skilled or unskilled tasks has its own variety of facets to bring to the table.

We are currently in the process of receiving our BEE scorecard. We support transformation in all areas of our company dynamics.



03 Human Resources

031 Employment Equity

Lizelle Gregory (100% interest)

Lizelle Gregory obtained a degree in Landscape Architecture from the University of Pretoria in 1992 and passed her board exam in 1995.

Her professional practice number is PrLArch 97078.

Ms. Gregory has been a member of both the Institute for Landscape Architecture in South Africa (ILASA) and South African Council for the Landscape Architecture Profession (SACLAP), since 1995.

Although the existing Environmental Legislation doesn't yet stipulate the academic requirements of an Environmental Assessment Practitioner (EAP), it is recommended that the Environmental Consultant be registered at the International Association of Impact Assessments (IAIA). Ms. Gregory has been registered as a member of IAIA in 2007.

Ms. Gregory attended and passed an International Environmental Auditing course in 2008. She is a registered member of the International Environmental Management and Assessment Council (IEMA).

She has lectured at the Tshwane University of Technology (TUT) and the University of Pretoria (UP). The lecturing included fields of Landscape Architecture and Environmental Management.

Ms. Gregory has more than 20 years experience in the compilation of Environmental Evaluation Reports:

Environmental Management Plans (EMP);

Strategic Environmental Assessments;

All stages of Environmental input ;

EIA under ECA and the new and amended NEMA regulations and various other Environmental reports and documents.

Ms. Gregory has compiled and submitted more than 600 Impact Assessments within the last 5-6 years. Furthermore, Ms. L. Gregory is also familiar with all the GDARD/Provincial Environmental policies and guidelines. She assisted and supplied GAUTRANS/former PWV Consortium with Environmental input and reports regarding road network plans, road determinations, preliminary and detailed designs for the past 12 years.



03 Human Resources

032 Members

Consulting

Anè Agenbacht

Introduction to Sustainable Environmental Management—An overview of Principles, Tools, & Issues (Potch 2006)
Leadership Training School (Lewende Woord 2010)
BA Environmental Management (UNISA 2011)
PGCE Education (Unisa 2013) - CUM LAUDE
Project Manager
More than 10 years experience in the compilation of various environmental reports

Mary-Lee Van Zyl

Msc. Plant Science (UP)
BSc (Hons) Plant Science (UP)
BSc Ecology (UP)
More than 3 years working experience in the Environmental field
Specialises in ECO works, Basic Assessments, EIA's, and Flora Reports
Compilation of various Environmental Reports

Dashentha Moodley

BA Honours Degree in Environmental Management (UNISA) - CUM LAUDE
Bachelor of Social Science in Geography & Environmental Management (UKZN)
More than 5 years experience in WUL Applications & Integrated Environmental Management within water resource management.
Senior Environmental Practitioner & Water Use Licence Consultant
Specialises in Water Use License & Compilation of various Env. Reports

Ben Bhukwana

BSc Landscape Architecture (UP)
More than 6 years experience in the field of Landscape Architecture (Design, Construction, and Implementation).
Specialises in Landscape Design, ECO, Rehabilitation Plans and Compilation Basic Assessment Reports
Compilation of Tender documents



03 Human Resources

033 Personnel

Juanita de Beer

Diploma Events Management and Marketing (Damelin)
Specializes in Public relations and Public Participation Processes (3 years experience)

Alfred Thomas

CIW Foundation & Internet Marketing (IT Academy)
12 years experience in GIS and IT in general.
GIS Operator and Multimedia Specialist.

Bianca Reyneke

Applying SHE Principles and Procedures (NOSA)
Intro to SAMTRAC Course (NOSA)
SHEQ Coordinator and compilation of environmental reports
Specialises in compiling various environmental reports

A.E. van Wyk

BSc. Environmental Sciences (Zoology and Geography)
Specialises in compiling various environmental reports



03 Human Resources

034 Personnel

Elsa Viviers

Interior Decorating (Centurion College)
(Accounting/ Receptionist) and Secretary to Lizelle Gregory

Loura du Toit

N. Dip. Professional Teacher (Heidelberg Teachers Training College)
Librarian and PA to Project Manager

Merriam Mogalaki

Administration Assistant with in-house training in bookkeeping

Landscape Contracting

Elias Maloka

Site manager overseeing landscape installations.
Irrigation design and implementation.
Landscape maintenance
More than 18 years experience in landscape construction works.

The contracting section comprises of six permanently employed black male workers. In many cases the team consists of up to 12 workers, depending on the quantity of work.



03 Human Resources

035 Personnel



01 Environmental Management Services

- Basic Assessment Reports
- EIA & Scoping Reports
- Environmental Management Plans
- Environmental Scans
- Strategic Environmental Assessments
- EMP for Mines
- Environmental Input and Evaluation of Spatial Development Frameworks
- State of Environmental Reports
- Compilation of Environmental Legislation and Policy Documents
- Environmental Auditing and Monitoring
- Environmental Control Officer (ECO)
- Visual Impact assessments
- Specialist Assistance with Environmental Legislation Issues and Appeals
- Development Process Management
- Water Use License applications to DWA
- Waste License Application



04 Services

041 Consulting Services

02 Landscape Architecture

- Master Planning
- Sketch Plans
- Planting Plans
- Working Drawings
- Furniture Design
- Detail Design
- Landscape Development Frameworks
- Landscape Development Plans (LDP)
- Contract and Tender Documentation
- Landscape Rehabilitation Works

03 Landscape Contracting

Implementation of Plans for:

- Office Parks
- Commercial/ Retail / Recreational Development
- Residential Complexes
- Private Residential Gardens
- Implementation of irrigation systems



Bokamoso

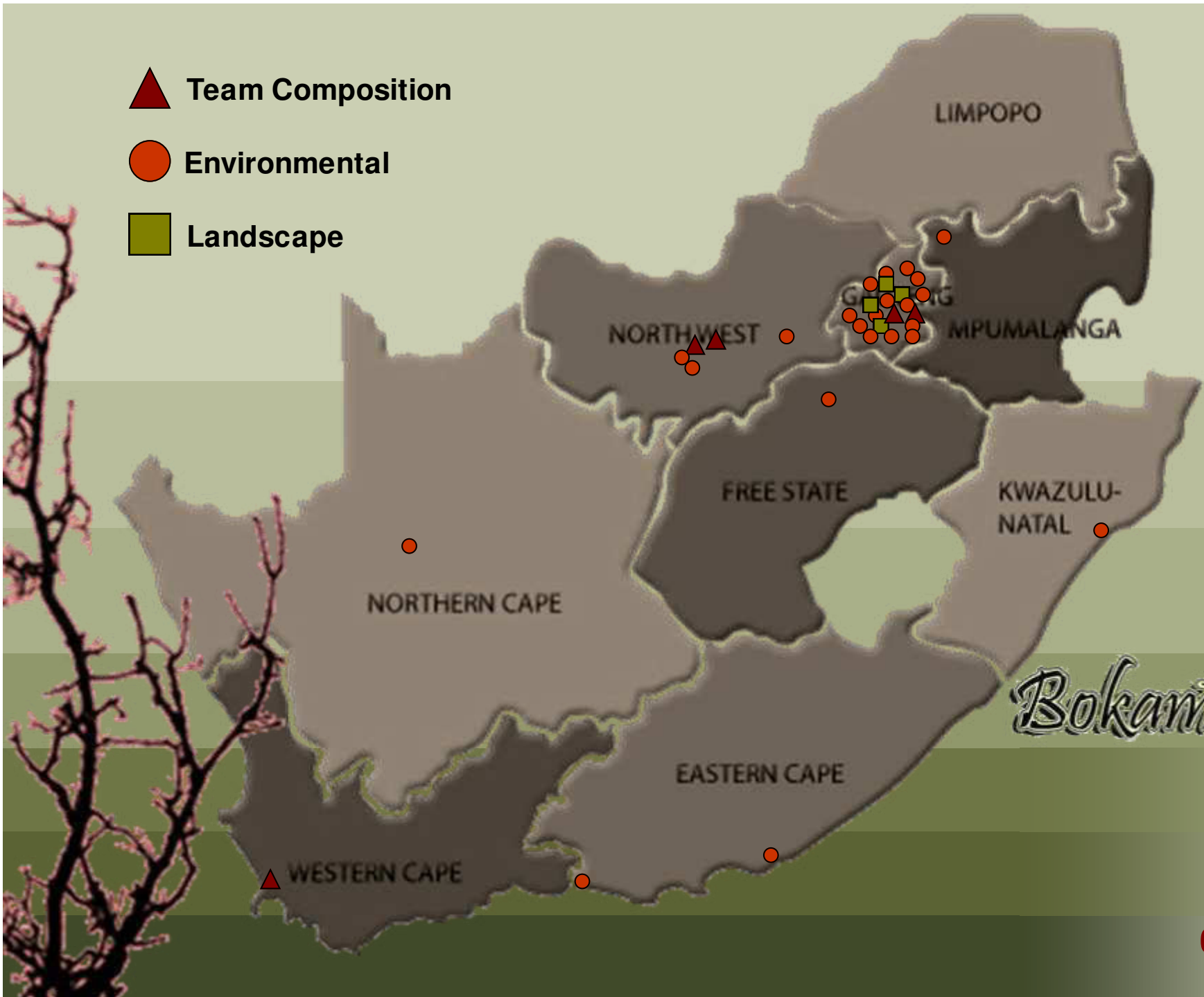
04 Services

042 Contracting Services

▲ Team Composition

● Environmental

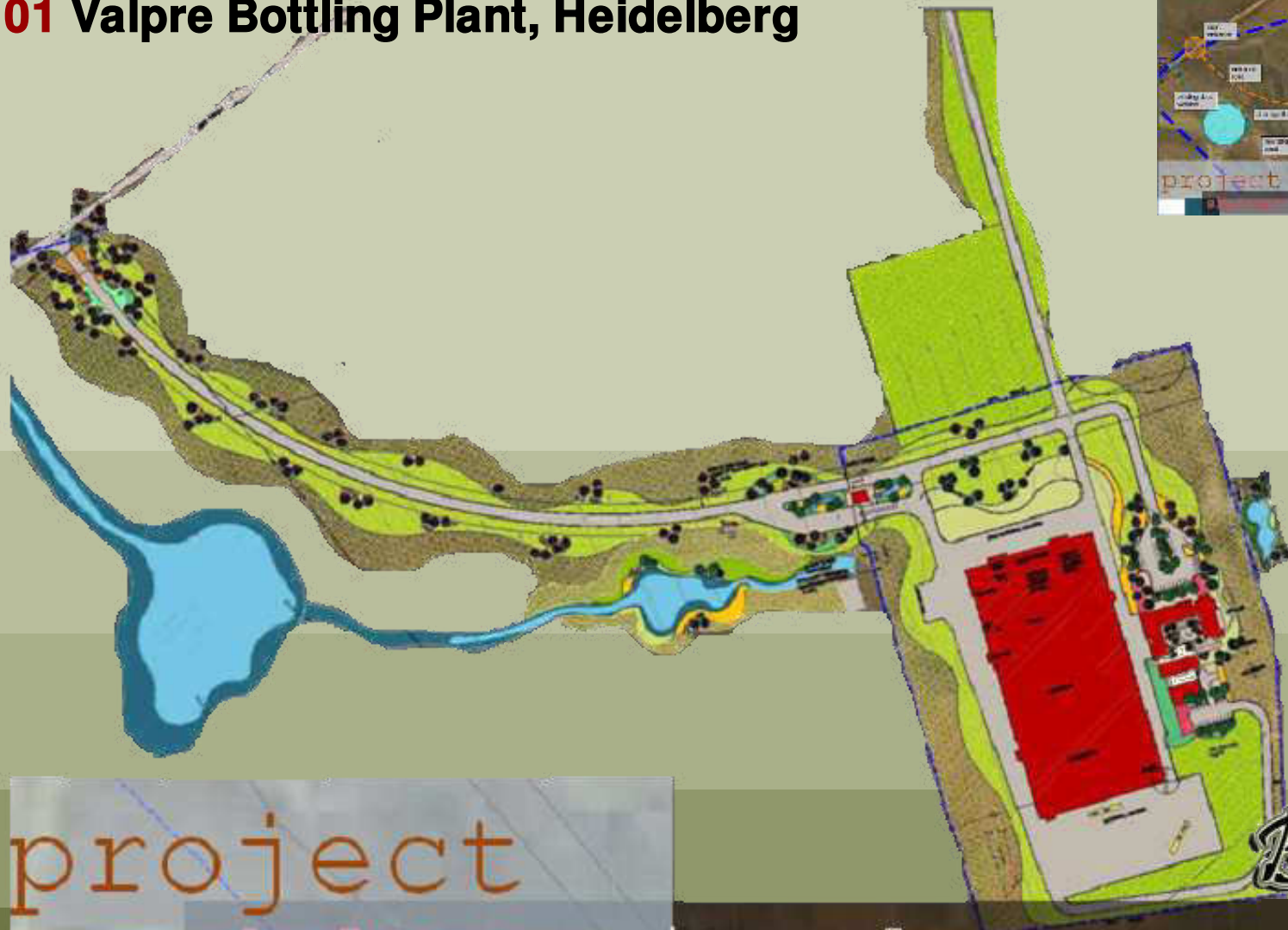
■ Landscape



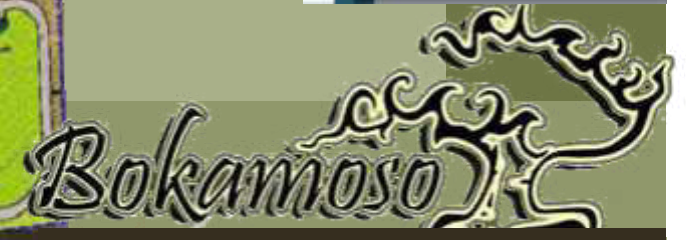
04 Services

043 Orientation

01 Valpre Bottling Plant, Heidelberg



project
shelter-site plan

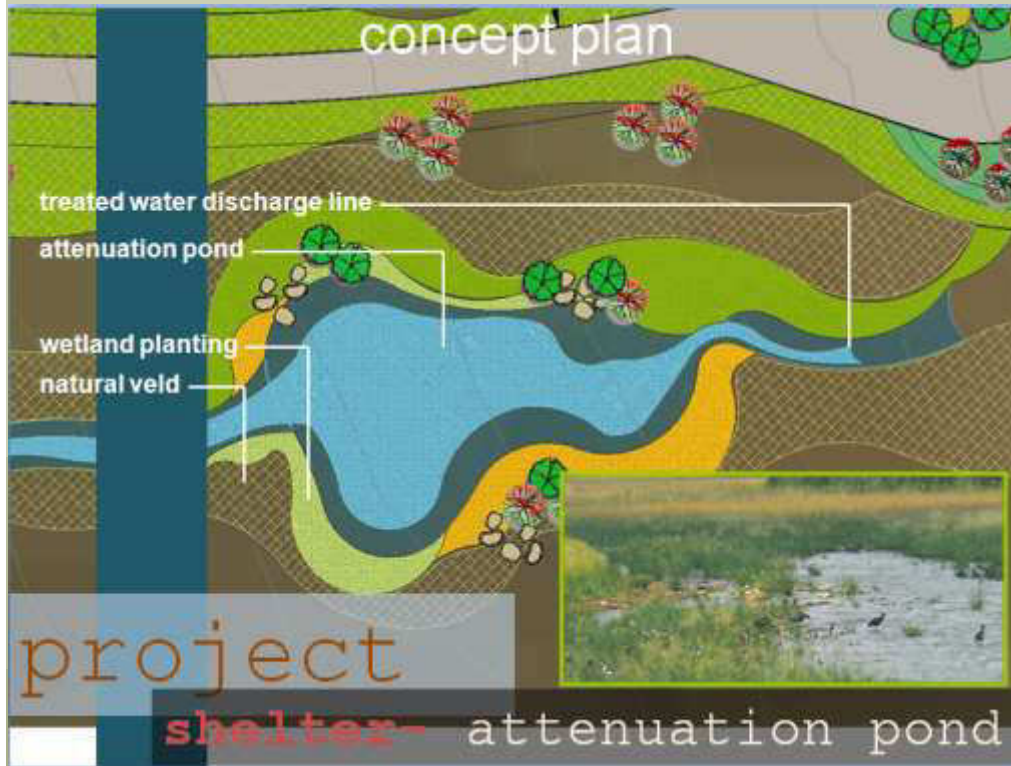


05 Landscape Projects- Current

051 Commercial



01 Valpre Bottling Plant, Heidelberg

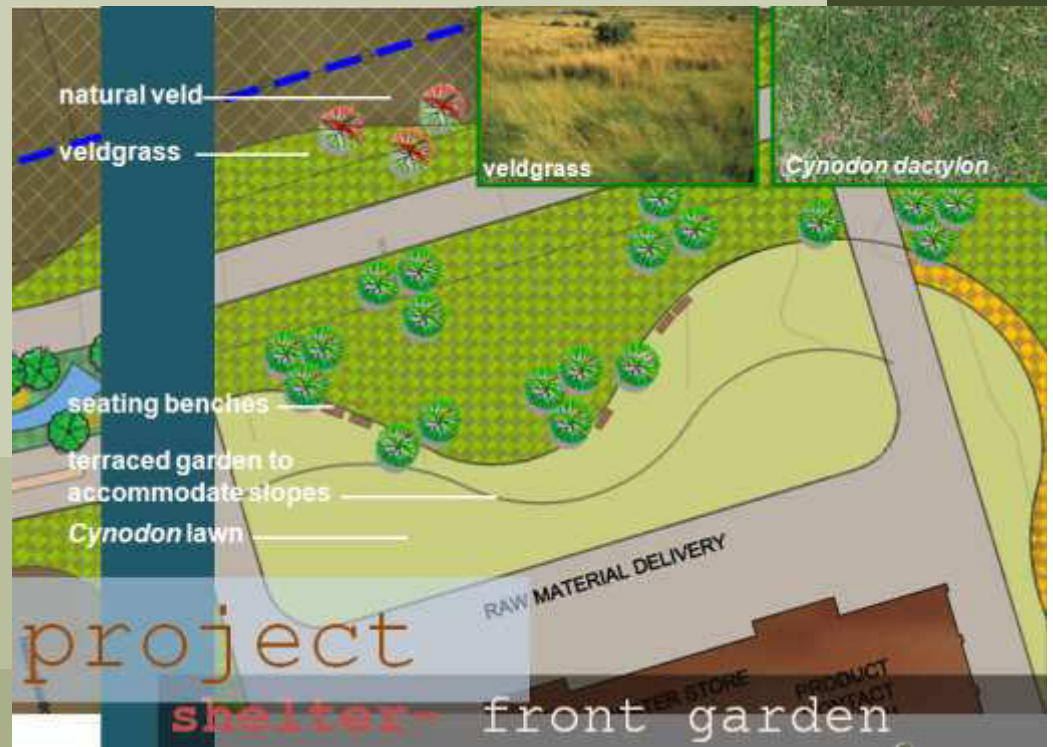


05 Landscape Projects- Current

051 Commercial



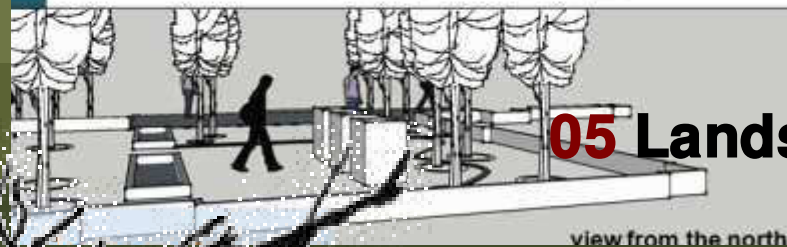
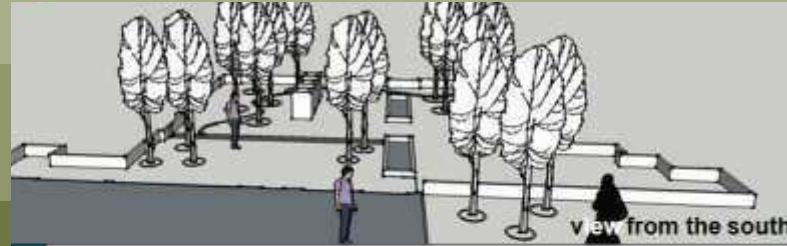
01 Valpre Bottling Plant, Heidelberg



05 Landscape Projects– Current

051 Commercial

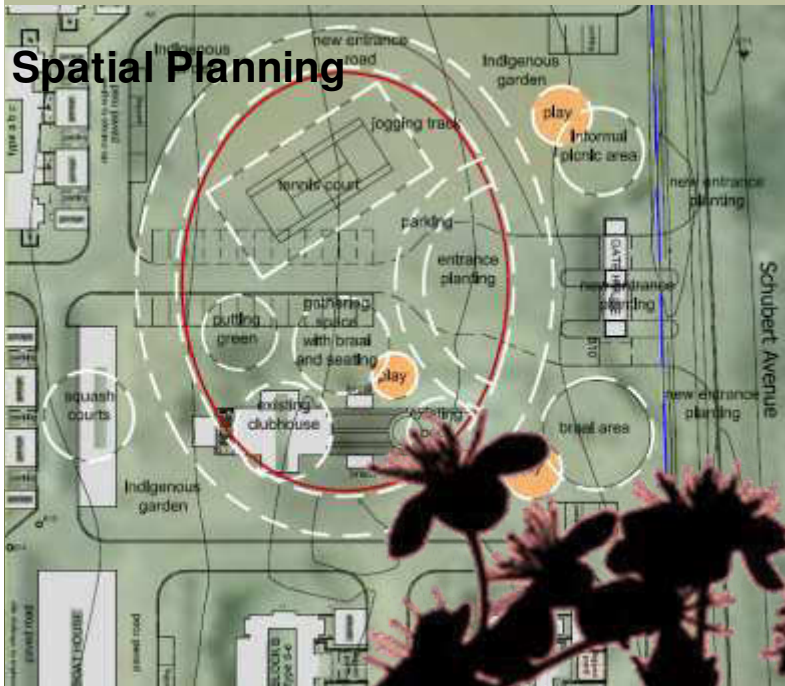
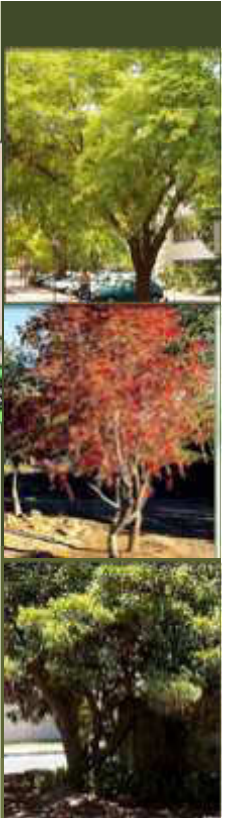
01 Valpre Bottling Plant, Heidelberg



05 Landscape Projects- Current

051 Commercial

02 Melodie Waters, Hartebeespoortedam



Streetscape

Indigenous Planting



05 Landscape Projects – Current

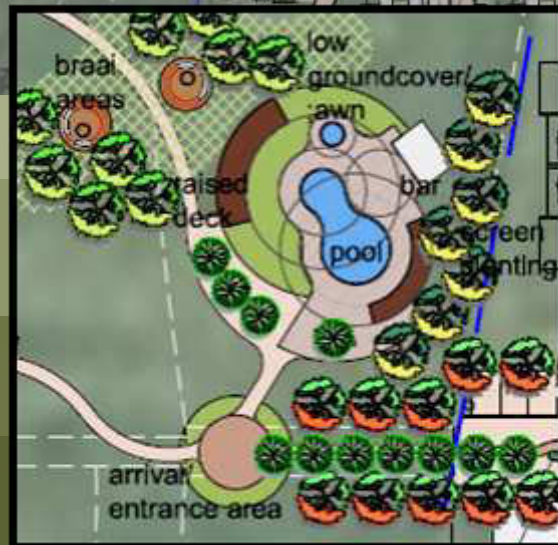
052 Commercial/Recreational



02 Melodie waters, Hartebeestpoortdam



Rehabilitation



Area Layout



05 Landscape Projects– Current

052 Commercial/Recreational

03 Grain Building, Pretoria



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05 Landscape Projects– Completed

053 Offices

04 Ismail Dawson offices, Pretoria



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05 Landscape Projects – Conceptual

053 Offices

05 Celtic Manor, Pretoria



Bokamoso

05 Landscape Projects - Completed

054 Complex Development

06 The Wilds, Pretoria



05 Landscape Projects – Completed

054 Complex Development

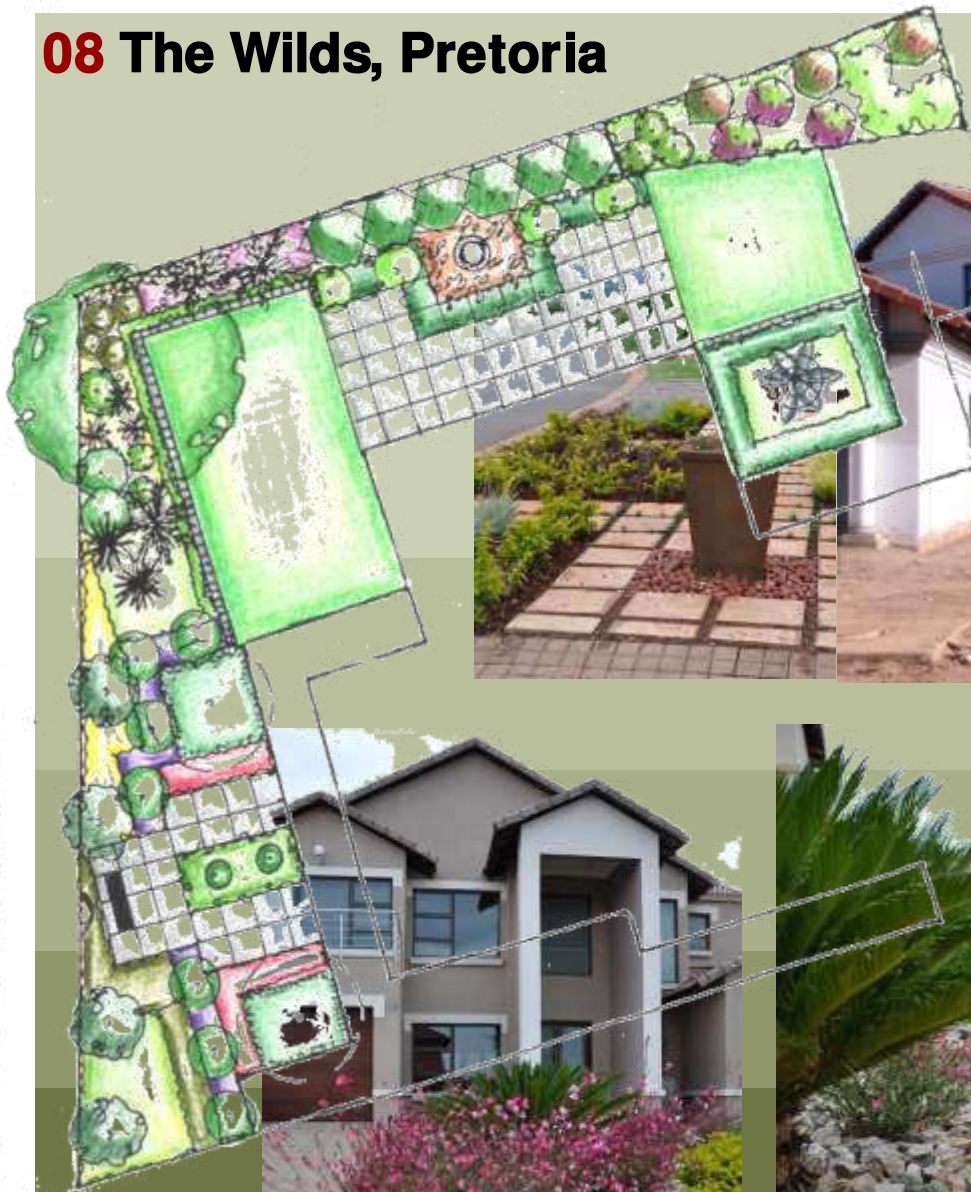
07 The Wilds, Pretoria



05 Landscape Projects – Completed

055 Residential

08 The Wilds, Pretoria



Bokamoso

05 Landscape Projects – Completed

055 Residential

09 The Wilds, Pretoria

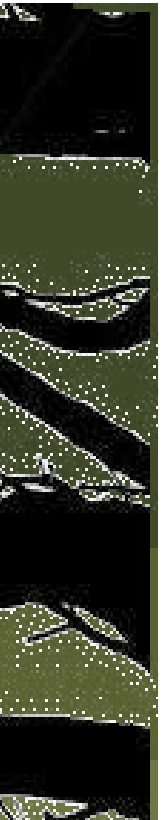


Bokamoso

05 Landscape Projects – Completed

055 Residential

010 The Wilds, Pretoria



05 Landscape Projects – Completed

055 Residential



011 Governor of Reserve Bank's Residence, Pretoria



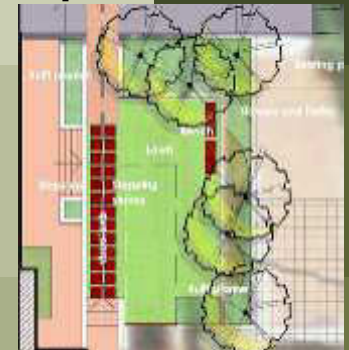
Plant Palette



Option 1



Option 2



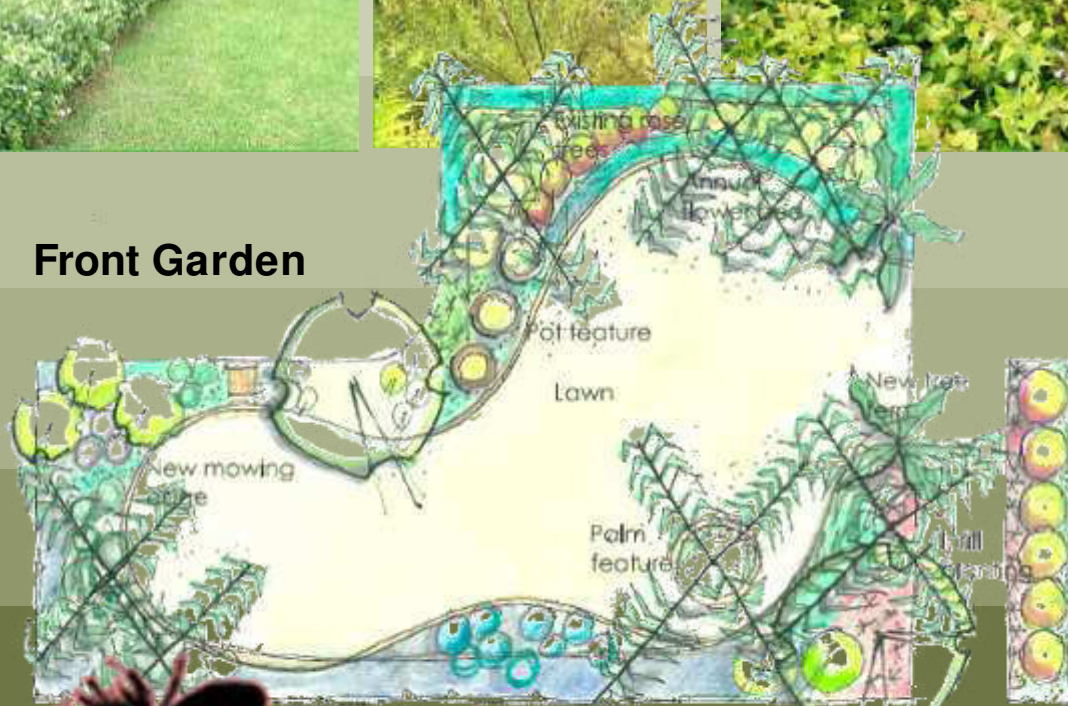
05 Landscape Projects – Conceptual

055 Residential

012 House Ismail, Pretoria



Front Garden

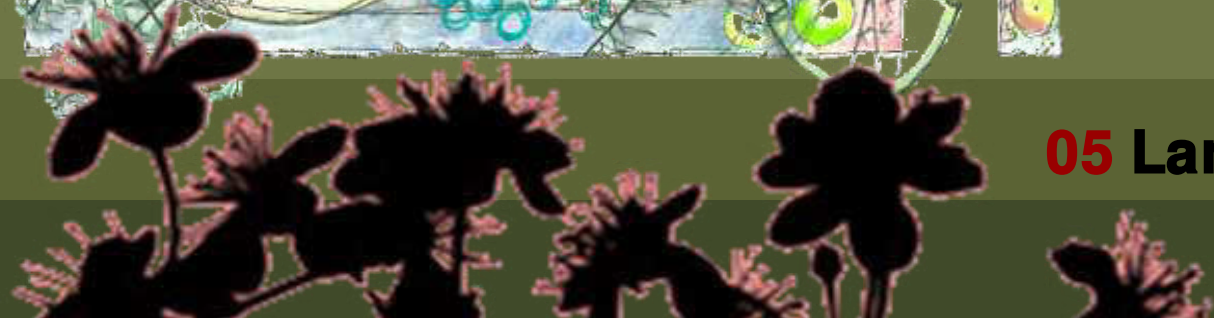


Back Garden



05 Landscape Projects - Conceptual

055 Residential



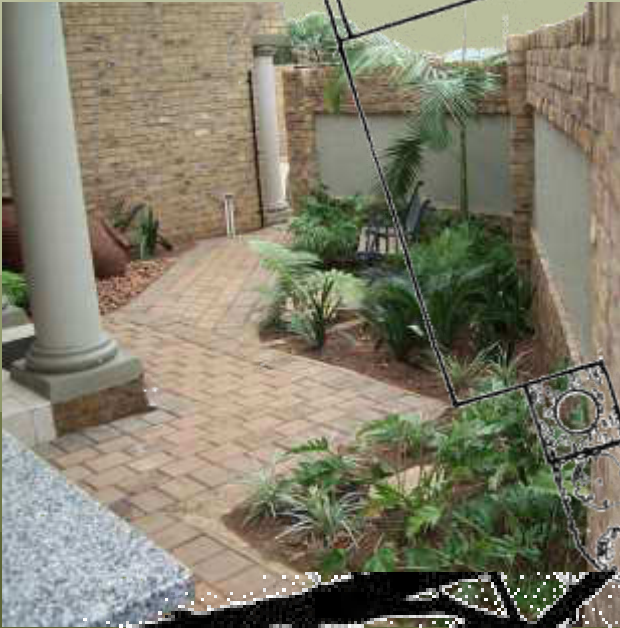
013 Forest Garden, Pretoria



05 Landscape Projects – Completed

055 Residential

015 Forest Garden, Pretoria



Bokamoso

05 Landscape Projects - Completed

055 Residential

01 Safari Garden Expo

Received a Silver Certificate at the Safari Garden Expo, 2010



06 Corporate Highlights

061 Awards

02 UNISA Sunnyside Campus, Pretoria

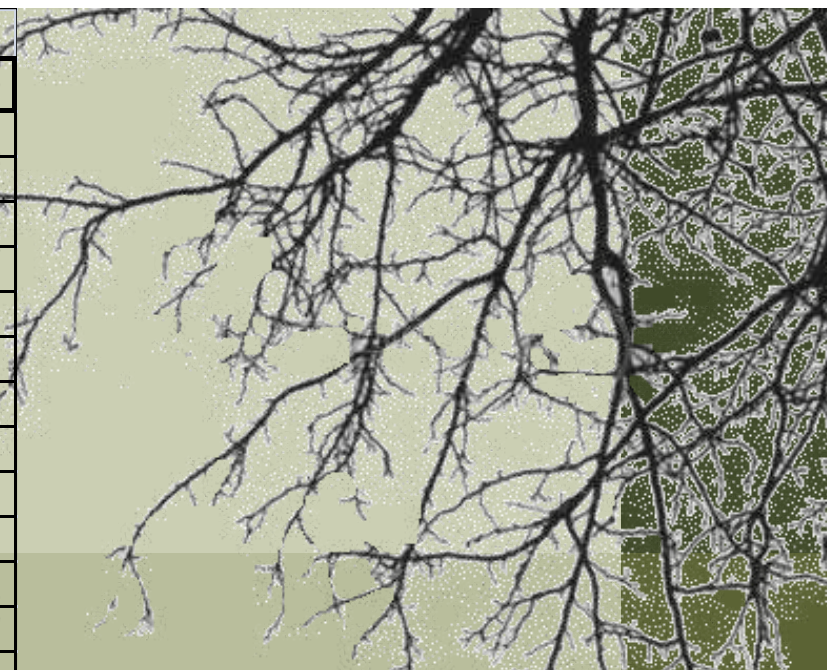
Best Commercial Paving Plan in Gauteng, 1997



06 Corporate Highlights

061 Awards

| Project Name | Status | Project |
|--|------------------|---------------|
| Environmental Impact Assessment(EIA) and Scoping Report | | |
| Junction 21 | ROD | EIA |
| 5 O'clock site access | In Progress | EIA |
| Bokamoso X 1 | In Progress | Scoping & EIA |
| Doornvallei Phase 6 & 7 | In Progress | EIA |
| Engen Interchange | In Progress | Scoping & EIA |
| Erasmia X15 | In Progress | EIA |
| Franschkloof | In Progress | EIA |
| K113 | Amendment of ROD | EIA |
| K220 East | ROD | EIA |
| K220 West | ROD | EIA |
| K54 ROD conditions | In Progress | EIA |
| Knopjeslaagte 95/Peachtree | ROD | EIA |
| Knopjeslaagte portion 20 & 21 | ROD | EIA |
| Lillieslief/Nooitgedacht | In Progress | EIA |
| Mooiplaats 70 (Sutherland) | In Progress | EIA |
| Naauwpoort 1 - 12/Valley View | In Progress | EIA |
| PeachTree X5 | In Progress | EIA |
| Strydfontein 60 | In Progress | EIA |
| Thabe Motswere | In Progress | Scoping & EIA |
| Vlakplaats | In Progress | EIA |
| Waterval Valley | In Progress | EIA |
| Environmental Opinion | | |
| Doornkloof 68 (Ross) | In Progress | Opinion |
| Monavoni X 53 | In Progress | BA & Opinion |
| Mooikloof (USN) | In Progress | Opinion |
| Norwood Mall/Sandspruit | In Progress | Opinion |
| Riversong X 9 | In Progress | Opinion |
| Sud Chemie | In Progress | Opinion |
| USN Benjoh Fishing Resort | In Progress | Opinion |



The adjacent list host the status of our current projects. Only a selected amount of projects are displayed.



07 Current Environmental Projects

071 EIA, Scoping & Opinion

| Project Name | Status | Project |
|-----------------------------|------------------|---------|
| Basic Assessment(BA) | | |
| Annlin X 138 | In Progress | BA |
| Clubview X 29 | ROD | BA |
| Darrenwood Dam | In Progress | BA |
| Durley Holding 90 & 91 | In Progress | BA |
| Elim | In Progress | BA |
| Fochville X 3 | In Progress | BA |
| Hartebeeshoek 251 | In Progress | BA |
| Klerksdorp (Matlosana Mall) | In Progress | BA |
| Monavoni External Services | ROD | BA |
| Monavoni X 45 | Amendment of ROD | BA |
| Montana X 146 | In Progress | BA |
| Rooihuiskraal X29 | In Progress | BA |
| Thorntree Mall | In Progress | BA |

| Environmental control officer (ECO) | | |
|--|-------------|-----|
| Grace Point Church | In Progress | ECO |
| R 81 | In Progress | ECO |
| Highveld X 61 | In Progress | ECO |
| Mall of the North | In Progress | ECO |
| Olievenhoutbosch Road | In Progress | ECO |
| Orchards 39 | In Progress | ECO |
| Pierre van Ryneveld Reservoir | In Progress | ECO |
| Project Shelter | In Progress | ECO |

| S24 G | | |
|----------------------|-------------|-------|
| Wonderboom | In Progress | S24 G |
| Mogwasi Guest houses | Completed | S24 G |



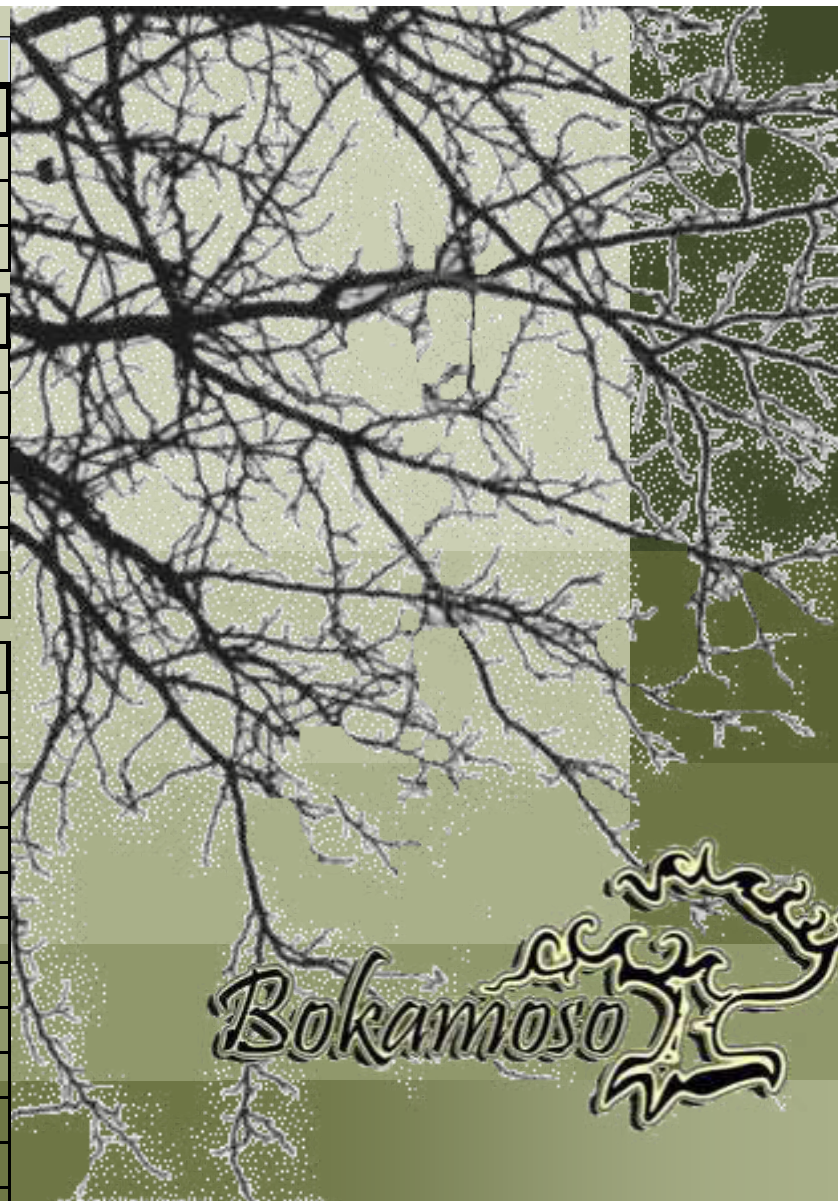
07 Current Environmental Projects

072 BA, ECO & S24 G

| Project Name | Status | Project |
|------------------|-------------|-----------|
| Objection | | |
| Colesberg WWTW | In Progress | Objection |
| Nigel Steelmill | Completed | Objection |
| Chantilly Waters | Completed | Objection |

| Development facilitation Act- Input (DFA) | | |
|--|-------------|---------------------|
| Burgersfort | In Progress | DFA & BA |
| Doornpoort Filling Station | In Progress | DFA & EIA & Scoping |
| Eastwood Junction | In Progress | DFA |
| Ingersol Road (Erf 78, 81 - 83) | In Progress | DFA |
| Roos Senekal | In Progress | DFA & EIA & Scoping |
| Thaba Meetse 1 | In Progress | DFA & EIA & Scoping |

| Water Use License Act (WULA) | | |
|-------------------------------------|-------------|-----------------|
| Britstown Bulk Water Supply | In Progress | WULA |
| Celery Road / Green Channel | In Progress | WULA |
| Clayville X 46 | In Progress | WULA |
| Dindingwe Lodge | In Progress | WULA |
| Doornpoort Filling Station | In Progress | WULA+DFA+EIA+SC |
| Eco Park Dam | In Progress | WULA |
| Groote Drift Potch | In Progress | WULA |
| Jozini Shopping Centre | In Progress | WULA+BA |
| K60 | Completed | WULA |
| Maloto Roads | In Progress | WULA |
| Kwazele Sewage Works | In Progress | WULA |
| Monavoni External Services | In Progress | WULA+BA |
| Nyathi Eco Estate | In Progress | WULA |
| Prairie Giants X 3 | In Progress | WULA |
| Waveside Water Bottling Plant | Completed | WULA |



07 Current Environmental Projects

073 Objection, DFA & WULA

| Project Name | Status | Project |
|---|-----------|---------|
| Environmental Management Plan(EMP) | | |
| Heidelberg X 12 | ROD | EMP |
| Monavoni Shopping Centre | Completed | EMP |
| Forest Hill Development | Completed | EMP |
| Weltevreden Farm 105KQ | Completed | EMP+EIA |
| Raslouw Holding 93 | Completed | EMP+BA |
| Durley Development | Completed | EMP+BA |
| Rooihuiskraal North X 28 | Completed | EMP |

| Rehabilitation Plan | | |
|----------------------------|-------------|----------------|
| Norwood Mall/Sandspruit | In Progress | Rehabilitation |
| Project Shelter Heidelberg | In Progress | Rehabilitation |
| Sagewood Attenuation Pond | ROD | Rehabilitation |
| Velmore Hotel | Completed | Rehabilitation |
| Grace Point Church | Completed | Rehabilitation |
| Mmamelodi Pipeline | Completed | Rehabilitation |

| Visual Impact Assessment | | |
|---------------------------------|-----------|-----------------|
| Swatzkop Industrial Developme | Completed | Assessment +DFA |
| Erasmia | Completed | Assessment |

| Signage Application | | |
|----------------------------|-----------|----------------|
| Menlyn Advertising | Completed | Signage |
| The Villa Mall | Completed | Signage+EMP+BA |



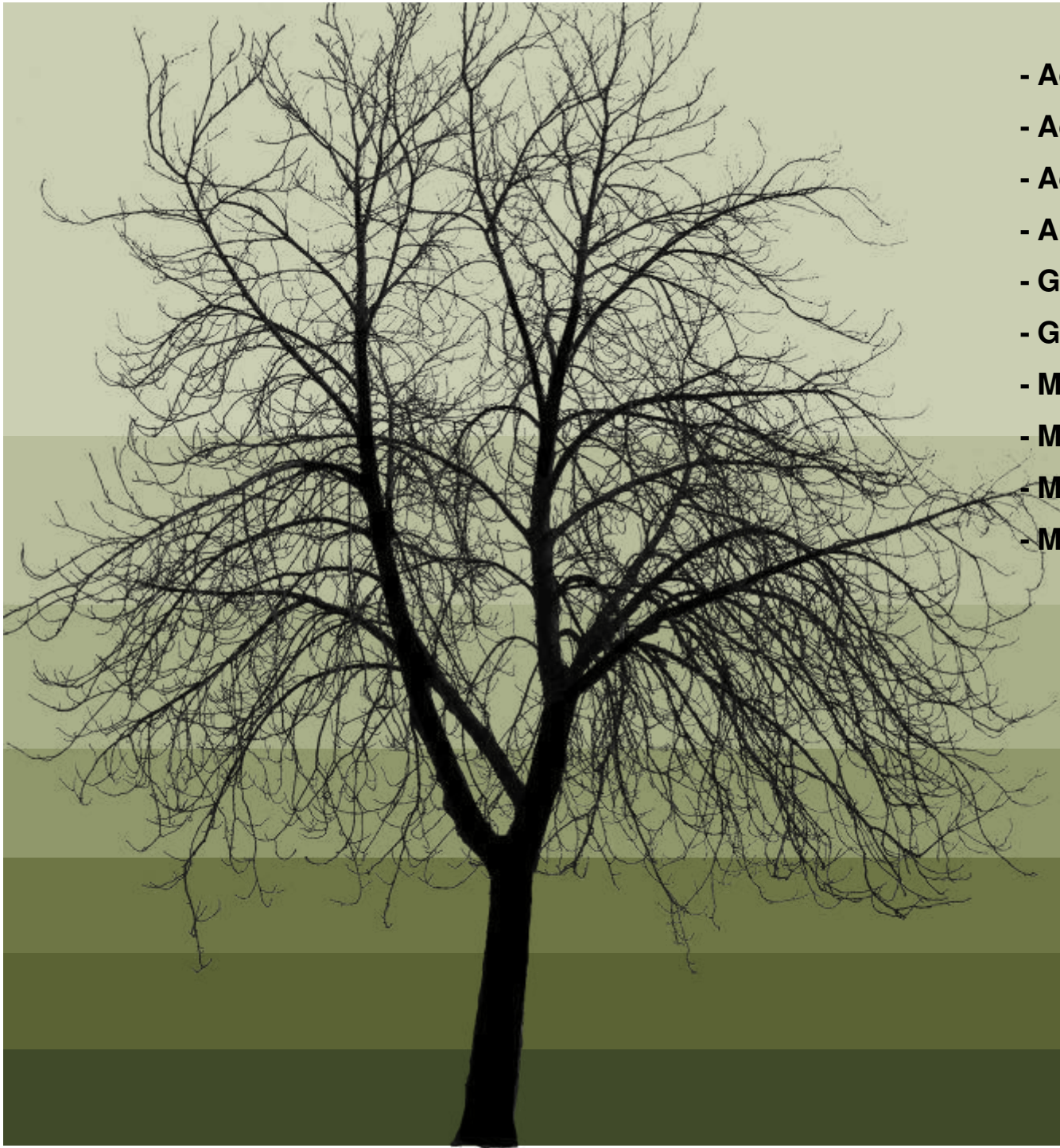
07 Current Environmental Projects

074 EMP, Rehabilitation , Waste Management & Signage Application

- Billion Property Group
- Cavaleros Developments
- Centro Developers
- Chaimberlains
- Chieftain
- Century Property Group
- Coca Cola
- Elmado Property Development
- Flanagan & Gerard
- Gautrans
- Hartland Property Group
- Moolman Group
- MTN
- M&T Development
- Old Mutual
- Property Investment Company
- Petroland Developments
- RSD Construction
- SAND
- Stephan Parsons
- Twin City Developments
- Urban Construction
- USN



08 Indicative Clients



- Adobe Illustrator CS3
- Adobe Photoshop CS3
- Adobe InDesign CS3
- AutoCAD
- Google SketchUP
- GIS
- Microsoft Office Word
- Microsoft Office Excel
- Microsoft Office Publisher
- Microsoft Office Power Point

Bokamoso 

Scoping Approval Letter



Annexure D



GAUTENG PROVINCE

AGRICULTURE AND RURAL DEVELOPMENT
REPUBLIC OF SOUTH AFRICA

Reference: Gaut:002/11-12/E0124
Enquiries: Marc Leroy
Telephone: (011) 240-3396
Email: Marc.leroy@gauteng.gov.za

Bokamoso Landscape Architects and Environmental Consultants
P.O. Box 11735
Maroelana
0161

Attn: Lizelle Gregory
Fax no: (086) 570 5659
Tel no.: (012) 346 3810

PER FACSIMILE

Dear Madam,

APPLICATION ACCEPTED: FINAL SCOPING REPORT FOR THE PROPOSED LANSERIA X51 ON PORTION 22 OF THE FARM BULTFONTEIN 533 JQ AND PORTION 164 OF THE FARM NOOITGEDAGHT 534 JQ. (GAUT: 002/11-12/E0124)

The Scoping Report and Plan of Study for Environmental Impact Assessment which was in respect of the above-mentioned application and received with a final amendment on 30 October 2014 has been accepted. All issues pertinent to the previous rejections of the Scoping Report (on 3 March 2013 and 10 July 2014) have been dealt with and you may accordingly proceed with undertaking the environmental impact assessment in accordance with the tasks that are outlined in the plan of study for environmental impact assessment

Yours faithfully

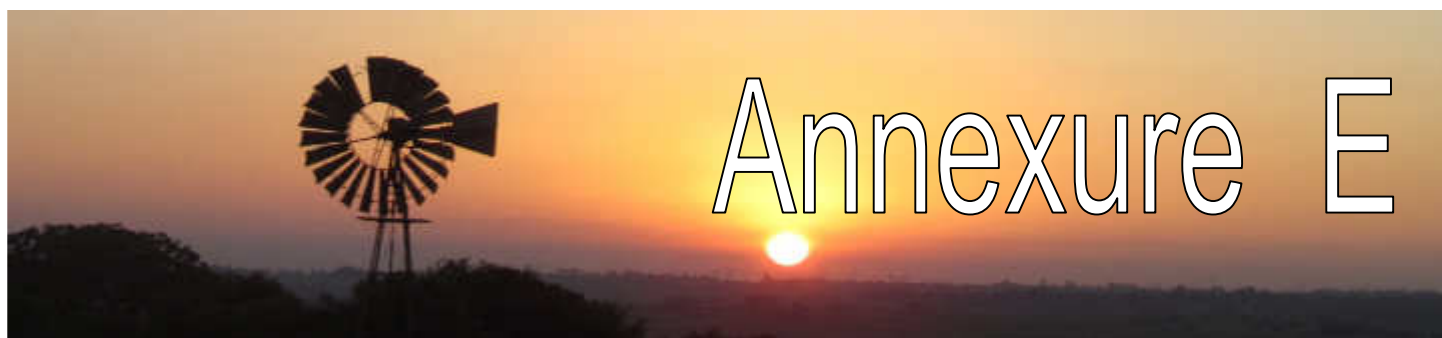
A handwritten signature in black ink, appearing to read 'B. Ndindani'.

Ms. B. Ndindani
Director: Environmental Planning & Impact Assessment (SWR)

Date: 26/01/2015

| | | | |
|-----|--|-------|--------------------|
| CC: | Extension 24 Commercial Leasing Co (Pty) Ltd. | Attn: | Chris Harris |
| | | Fax: | (011) 803 9550 |
| | City of Johannesburg Metropolitan Municipality | Attn: | Ms Flora Mokgohloa |
| | | Fax: | (011) 339 1885 |
| | Project Manager | Attn: | Marc Leroy |
| | | Fax: | (086) 620 7364 |

Correspondance form GDARD





GAUTENG PROVINCE

AGRICULTURE AND RURAL DEVELOPMENT
REPUBLIC OF SOUTH AFRICA

Reference: Gaut:002/11-12/E0124
Enquiries: Marc Leroy
Telephone: (011) 240-3396
Email: Marc.leroy@gauteng.gov.za

Bokamoso Landscape Architects and Environmental Consultants
P.O. Box 11735
Maroelana
0161

Attn: Lizelle Gregory
Fax no: (086) 570 5659
Tel no.: (012) 346 3810

PER FACSIMILE

Dear Madam,

APPLICATION REJECTED: FINAL SCOPING REPORT FOR THE PROPOSED LANSERIA X51 ON PORTION 22 OF THE FARM BULTFONTEIN 533 JQ AND PORTION 164 OF THE FARM NOOITGEDAGHT 534 JQ. (GAUT: 002/11-12/E0124)

The Scoping Report and Plan of Study for Environmental Impact Assessment which was submitted by you in respect of the abovementioned application and received by the Department on 18 December 2012 refers

The Scoping Report and Plan of Study for Environmental Impact Assessment has been rejected by the Department in terms of regulation 30(1) (c) of the Environmental Impact Assessment Regulations, 2010 promulgated in terms of sections 24 (5) and 44 of the National Environmental Management Act, 1998 (Act 107 of 1998) (as amended) because, *inter alia*, -

- a) The Landowner stated in the application form is "**Extension 24 Commercial Leasings Co. (Pty) Ltd.**", yet on according to the Scoping Report (page 13), the registered owner is "**Hendruk Properties (Pty) Ltd.**". Please indicate the correct registered owner.
- b) In the response by the Department (to your initial submission) dated 3 March 2013, the Department asked for the validation of the comparison tables between the no-go and the proposal. The outcomes of the preliminary environmental issues have now changed from those submitted initially, without explanation as to the changes. Please provide and explanation to these alterations in the assumed impacts.

In terms of Regulation 30(3), you are entitled to re-advertise the scoping report and plan of study for environmental impact assessment after making the necessary amendments. Should you wish to resubmit the report, please note that in order to give effect to the requirements of administrative justice, you must make the amended report which is to be submitted to the Department available to registered interested and affected parties for comment and draw the attention of all registered

interested and affected parties to the provisions of the regulations relating to public participation process. Any comments received from registered interested and affected parties on the amended report must be included in the amended report.

In addition to the above, please note that in terms of Regulation 71 of the Environmental Impact Assessment Regulations (GN 543 of 2010 as amended), it is an offence to submit incorrect or misleading information.

In terms of Regulation 67(1) (2) of the NEMA EIA Regulations 2010, this application will lapse should you fail to submit the requested information within 6 months of the date of signature of this letter, except in the case where the Department has received and accepted written explanation for failure to submit such information.

If you have any queries concerning this issue please feel free to contact the relevant official at the number given above.

Yours faithfully



Mr. L.W. Mkwana
Chief Director: Sustainable Use of Environment

Date: 10/07/2014

CC: Extension 24 Commercial Leasing Co (Pty) Ltd.

Attn: Chris Harris
Fax: (011) 803 9550

City of Johannesburg Metropolitan Municipality

Attn: Ms Flora Mokgohloa
Fax: (011) 339 1885

Project Manager

Attn: Marc Leroy
Fax: (086) 620 7364

27/05/2014



agriculture and rural development

Department: Agriculture and Rural Development
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| | |
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| Reference: | Gaut: 002/11-12/E0124 |
| Enquiries: | Justine Chan |
| Telephone: | (011) 240 3048 |
| Email: | Justine.Chan@gauteng.gov.za |

Bokamoso Landscape Architects and Environmental Consultants

Email/Fax: lizelleg@mweb.co.za

Dear Sir/ Madam

Amended Final Scoping Report: / Mixed land use development on portion 22 of the farm Bultfontein 533 JQ and portion 164 of the farm Nooitgedacht 534 JQ

The Department acknowledges having received the amended report for environmental authorisation of the abovementioned project on 20/05/2014.

Please draw the applicant's attention to the fact that the activity may not commence prior to an environmental authorisation being granted by the Department.

Yours faithfully

Boniswa Belot

Deputy Director; Strategic Administration Support

Date: 27/05/2014

CC: Extension 24 Commercial Leasing Co (Pty) Ltd

Att: Email/Fax:

C Harris
chris@syndev.co.za



GAUTENG PROVINCE

REPUBLIC OF SOUTH AFRICA

| | |
|------------|---------------------------|
| Reference: | Gaut:002/11-12/E0124 |
| Enquiries: | Marc Leroy |
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Bokamoso Landscape Architects and Environmental Consultants
P.O. Box 11735
Maroelana
0161

Attn: Lizelle Gregory
Fax no: (086) 570 5659
Tel no.: (012) 346 3810

PER FACSIMILE

Dear Madam,

APPLICATION REJECTED: FINAL SCOPING REPORT FOR THE PROPOSED LANSERIA X51 ON PORTION 22 OF THE FARM BULTFONTEIN 533 JQ AND PORTION 164 OF THE FARM NOOITGEDAGHT 534 JQ. (GAUT: 002/11-12/E0124)

The Scoping Report and Plan of Study for Environmental Impact Assessment which was submitted by you in respect of the abovementioned application and received by the Department on 18 December 2012 refers

The Scoping Report and Plan of Study for Environmental Impact Assessment has been rejected by the Department in terms of regulation 30(1) (c) of the Environmental Impact Assessment Regulations, 2010 promulgated in terms of sections 24 (5) and 44 of the National Environmental Management Act, 1998 (Act 107 of 1998) (as amended) because, *inter alia*, -

- a) There is no "Plan of Study" for the project (a requirement in terms of Regulation 28(1)(n) of the EIA regulations (GN 543). The Plan of Study section (Page 78) refers to Annexure D for the Plan of Study. Annexure D is blank.
- b) The Draft Scoping report was to be submitted by the cut off date of 30 June 2012. This document, the Final Scoping report, was submitted on 18 December 2012, with no correspondence attached proving the submission of the draft, nor communication with the Department in this regard.
- c) There are too many discrepancies in the document to determine what is correct, a few issues are described below:
 - i. The listed activities included activities that are not related to the activity on site. For example, road determination (Activity 18 – GN 545) is not an activity relevant to township development. Activity 28 (GN 544) talks to expansion of a facility resulting in a need for a permit for pollution, the activity (a chicken farm) is not being expanded; it is being changed to a township. The listed activities 11 and 18 (GN 544) deal with impacts on watercourses or impacts within 32 m of a watercourse. The watercourse (GIS and site visit) is greater than 150m from the site.

- ii. The document further points to the fact that there is no wetland or river on site (page 22), yet indicates that if construction happens in summer months, the wet conditions would affect road construction difficult and rehabilitation difficult in the floodline and wetland areas (page 25).
- iii. Page 23 indicates that ground water levels will be determined by a geotechnical Survey, yet on the same page indicates that a detailed geotechnical survey has already been completed.
- iv. The Landowner stated in the application form is "Extension 24 Commercial Leasings Co. (Pty) Ltd.", yet on according to the Scoping Report (page 12), the registered owner is "Hendruk Properties (Pty) Ltd.". Who is the legal person on this project?
- d) The comparison tables between the "No-go" and the proposal are not validated (page 14), and there is little proof to show that developing a township in the area will have a positive effect on the geology, whilst leaving it will have a negative effect. The same goes for the other information in the table.
- e. The Irene weather station (30 km away) is used for weather data, while a more accurate (closer) weather station is Lanseria Airport (a few km away).
- f) Page 27 alludes to recommendations from GDARD as to the specialist studies required on site, yet no documentation to this effect is included in the report.
- g) Only one alternative is discussed in the beginning of the Scoping report (Mixed use), whilst Mixed Use and Residential alternatives (two alternatives) are discussed in the potential impact table (page 54-67). All alternatives including the "no-go" option must be discussed and evaluated throughout the EIA process.


In terms of Regulation 30(3), you are entitled to resubmit scoping report and plan of study for environmental impact assessment after making the necessary amendments. Should you wish to resubmit the report, please note that in order to give effect to the requirements of administrative justice, you must make the amended report which is to be submitted to the Department available to registered interested and affected parties for comment and draw the attention of all registered interested and affected parties to the provisions of the regulations relating to public participation process. Any comments received from registered interested and affected parties on the amended report must be included in the amended report.

In addition to the above, please note that in terms of Regulation 71 of the Environmental Impact Assessment Regulations (GN 543 of 2010 as amended), it is an offence to submit incorrect or misleading information.

In terms of Regulation 67(1) (2) of the NEMA EIA Regulations 2010, this application will lapse should you fail to submit the requested information within 6 months of the date of signature of this letter, except in the case where the Department has received and accepted written explanation for failure to submit such information.

If you have any queries concerning this issue please feel free to contact the relevant official at the number given above.

Yours faithfully



Mr. L.W. Mkwana
Acting Chief Director: Sustainable Use of Environment
Date: 03/03/2013

| | | | |
|-----|--|-------|--------------------|
| CC: | Extension 24 Commercial Leasing Co (Pty) Ltd. | Attn: | Chris Harris |
| | | Fax: | (011) 803 9550 |
| | City of Johannesburg Metropolitan Municipality | Attn: | Ms Flora Mokgohloa |
| | | Fax: | (011) 339 1885 |
| | Project Manager | Attn: | Marc Leroy |
| | | Fax: | (086) 620 7364 |



agriculture and rural development

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Website: <http://www.gdard.gpp.gov.za>

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| Reference: | Gaut: 002/11-12/E0124 |
| Enquiries: | Justine Chan |
| Telephone: | (011) 355-1256 |
| Email: | Justine.Chan@gauteng.gov.za |

Bokamoso Landscape Architects and Environmental Consultants

Fax no. 086 570 5659

PER FACSIMILE

Dear Sir/ Madam

**Final Scoping Report: / Mixed land use development on portion 22 of the farm
Bultfontein 533 JQ and portion 164 of the farm Nietgedacht 534 JQ**

The Department acknowledges having received the report for environmental authorisation of the abovementioned project on 18/12/2012.

Please draw the applicant's attention to the fact that the activity may not commence prior to an environmental authorisation being granted by the Department.

Yours faithfully

UBelot

Boniswa Belot

Deputy Director: Strategic Administration Support

Date: 15/01/2013

CC: Extension 24 Commercial Leasing Co (Pty) Ltd

Att: C Harris

Tel: 011 803 9233

Fax: 011 803 9550

30/05/2012.



agriculture and rural development

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| Reference: | Gaut: 002/11-12/E0123 |
| Enquires: | Justine Chan |
| Telephone: | (011) 355-1830 |
| Email: | Justine.Chan@gauteng.gov.za |

Bokamoso Landscape Architects and Environmental Consultants

Fax no. 086 570 5659

PER FACSIMILE

Dear Sir/ Madam

Request for extension of time to submit Draft Scoping Reports: Mixed land use development on portion 27 and 73 of the farm Nietgedacht 535 JQ

The Department acknowledges having received your request for extension of time to submit Draft Scoping Reports for the abovementioned project on 29/03/2012.

Your request for extension of time to submit Draft Scoping Reports, has been granted. Thus, you have until the 30/06/2012 to submit the Draft Scoping Reports.

Please draw the applicant's attention to the fact that the activity may not commence prior to an environmental authorisation being granted by the Department.

Yours faithfully

UBelot

Boniswa Belot

Deputy Director: Strategic Administration Support

Date: 28/05/2012

CC: Extension 24 Commercial Leasing Co (Pty) Ltd

Att: C Harris

Tel: 011 803 9233

Fax: 011 803 9550



agriculture and rural development

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| | |
|------------|--|
| Reference: | Gaut: 002/11-12/E0124 |
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| Email: | Justine.Chan@gauteng.gov.za |

Bokamoso Landscape Architects and Environmental Consultants

Fax no. 086 570 5659

PER FACSIMILE

Dear Sir / Madam

Application for Environmental Authorisation: Mixed land use development on portion 22 of the farm Bultfontein 533 JQ and portion 164 of the farm Nietgedacht 534 JQ

The Department acknowledges having received the application form for environmental authorisation of the above-mentioned project on 22/08/2011.

The application has been assigned the reference number Gaut: 002/11-12/E0124. Kindly quote this reference number in any future correspondence in respect of the application.

Please circulate the draft report to any state department that administers a law relating to a matter affecting the environment to comment.

You are required to submit two (2) copies (full colour CDs-PDF) of the Draft Scoping Report as well as proof of submission to state departments referred to above.

In order to determine whether a biodiversity assessment is required and, if so, which specialist studies are required, please send a shapefile (WGS84 datum; geographic co-ordinate system) of the application site to our biodiversity information service (GDACE_BiodiversityInfo@gauteng.gov.za), the e-mail clearly indicating the project

reference number. Where biodiversity assessment is required; please ensure that it is conducted consistent with the *GDACE Requirements for Biodiversity Assessments*. A copy of this document can be obtained by e-mailing GDACE_BiodiversityInfo@gauteng.gov.za

In terms of Regulation 67(1) (2) of the NEMA EIA Regulations 2010, this application will lapse should you fail to submit the requested information within 6 months of the date of signature of this letter, except in the case where the Department has received and accepted written explanation for failure to submit such information.

Please draw the applicant's attention to the fact that the activity may not commence prior to an environmental authorisation being granted by the Department.

Yours faithfully



Boniswa Belot
Deputy Director: Strategic Administration Support

Date: 30/08/2011

CC: Extension 24 Commercial Leasing Co (Pty) Ltd Att: C Harris
Tel: 011 803 9233
Fax: 011 803 9550

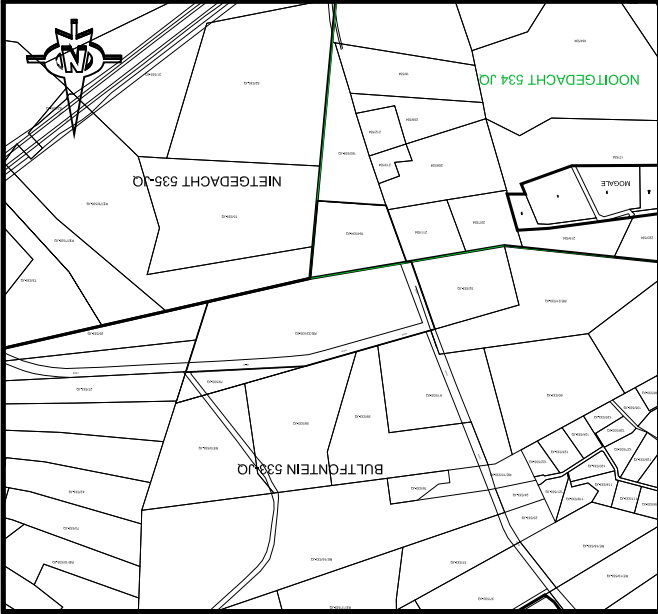
Preliminary Layout



Floodline Certification

In accordance with Section 144 of Act 36 of 1998, it is hereby certified that the township shown on this plan is not affected by the maximum flood in any public stream which would be caused by storms of recurrence intervals of 50 to 100 years

Name of Engineer
 Registration No.
 Date



LOCALITY PLAN

TOWNSHIP DATA

| LAND-USE | No. OF ERVEN | ERF No'S | AREA (ha) | AREA OF TOTAL |
|----------|--------------|----------|-----------|---------------|
| SPECIAL | 4 | 1 TO 4 | 27,9604 | 75,92 |
| ROADS | | | 8,8701 | 24,08 |
| TOTAL | 4 | | 36,8305 | 100,00 |

NOTES

- All areas and dimensions are approximate, being subject to final survey.
- Contours are in accordance with the standards laid down in regulation 18(2) of the Town Planning and Townships (Ordinance 15, 1986)
- Datum plane - Mean Sea Level; Interval 1m
- Co-ordinate system: WGS 84 L₀. 29°
- The figure lettered **ABCD**A represents the Remainder of Portion 22 Bultfontein 533 JQ, being 28,0283Ha in extent and the figure **FGHJ**F represents Portion 164 Nootgedacht 534 JQ, being 8,8022Ha in extent
- The township falls under the jurisdiction of City of Johannesburg
- Base plan information was obtained from

PROPOSED TOWNSHIP

LANSERIA EXTENSION 51

TO BE ESTABLISHED ON PORTION 164 NOOTGEDACHT 524 JQ AND THE REMAINDER OF PORTION 22 BULFONTEIN 533 JQ

TINIE BEZUIDENHOUT AND ASSOCIATES
Town Planning Consultants

Physical Address
 Unit 50, Thembi Place Office Park
 P.O. Box 98558
 Sloane Park
 Lone Hill
 2152

Phone (011) 467-1004 Telefax (011) 467-1170 e mail tiniebez@tafrica.com

DATE: 15 NOVEMBER 2010 PLAN NO. 7091/L1

Specialist Studies



Geotechnical Investigation



May 2010

X51

**A GFSH-2 PHASE 1 GEOTECHNICAL
REPORT TO BIGEN AFRICA: SITE 1
REMAINING EXTENT OF PORTION 22 OF
THE FARM BULTFONTEIN 533-JQ AND PORTION
164 OF THE FARM NOOIGEDACHT 534-IQ**

IR977 Site 1

**INTRACONSULT CC
P.O. BOX 604
FOURWAYS
2056
TEL: (011) 469 0854
FAX: (011) 469 0961
EMAIL : intrac@nwweb.co.za**

MAY 2010

**A GSFH-2 PHASE 1 GEOTECHNICAL REPORT TO BIGEN AFRICA: SITE 1 -
REMAINING EXTENT OF PORTION 22 OF THE FARM BULTFONTEIN 533-JQ AND
PORTION 164 OF THE FARM NOOITGEDACHT 534-IQ**

SUMMARY Preface

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LOCALITY PLAN FIGURE 1

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SUMMARIES OF LABORATORY TEST RESULTS (DISTURBED) TABLE 2

SUMMARIES OF LABORATORY TEST RESULTS (UNDISTURBED) TABLE 3

1. INTRODUCTION AND TERMS OF REFERENCE

This report presents and comments on the results and observations of investigations carried out for geotechnical site analysis and towards NHBC enrolment of stands planned for township development on Site 1.

The terms of reference and scope of the work to be undertaken were contained in Intraconsult proposal IR977p dated 25 February 2010.

intraconsult was instructed to proceed with the Geotechnical investigations by Mr. De Villiers Strauss of Bigen Africa.

2. INFORMATION USED IN THIS STUDY

The following information has been used in the investigation and assessment of the site:

- Locality and Topographical plans of the site provided by Thie Bezuidenhout and Associates.
- Geological Map Issued by the Director of Geological Survey: at a scale of 1:250 000.
- Selected air photographs and ground contours of the study area.
- National Home Builders Registration Council; Home Builders Manual: Parts 1 and 2, Revision 1, February 1990.
- SAIEG and SAICE; "Guidelines for urban Engineering Geological Investigations".
- Soil Survey for Engineering : Brink, Partridge and Williams (1982).
- Expansive Roadbed Treatment for Southern Africa: D J Weston (1980). 4th Int. Conf. for Expansive Soil Vol. 1 Denver pp 339-360.
- National Department of Housing Generic Spec. GFSH - 2, September 2002.

3. SITE DESCRIPTION

The study area of approximately 36.6 ha is located on the remaining extent of Portion 22 of the farm Bullfontein 533-JQ and portion 164 of the farm Nooitgedacht 534-IQ. The site covers an area of 36.82ha and is situated near the crest of a hill in the south eastern corner with gentle (1:27) slopes to the north, north west and north east. [The site is currently covered by poultry farm buildings and scattered farm houses for staff use. A stockpile of topsoil lies in the north western corner of site and stockpiles of compost and waste lie along the southern boundary.] A locality plan is provided in Figure 1.

5.2 Soil Profile

The residual soils are only partly or thinly developed across the site and comprise of gravelly silty sands and clayey silts. The overlying transported soils are predominantly silty (fine) sandy materials.

The general soil "types" uncovered during these investigations are as follows:

- **Hillwash**

Moist, grey brown, loose to medium dense intact medium and fine sand with roots.

- **Pebble Marker**

Closely packed medium and fine grained, sub-angular and angular quartz gravels with ferruginous concretions and nodules, generally loose to medium dense, intact to friable.

- **Reworked residual granite**

Moist, orange brown mottled and blotched grey and buff, dense, clayey sand, occasionally ferruginised.

- **Reworked residual diabase**

Moist, orange blotched dark grey and brown mottled black, stiff shattered clayey silt.

- **Residual diabase**

Moist, pale green speckled black blotched orange, stiff, relic jointed slightly clayey silt.

Scattered boulder outcrop was observed near the hill crest in the south eastern sector of the site.

5.3 Groundwater occurrence

Although field evidence is limited, the site is a typical hard rock environment and where two distinct aquifer systems can be anticipated. There are firstly a shallow primary weathered aquifer and secondly the possibility of deeper secondary aquifer systems associated with fractures, joints and other discontinuities within the bedrock mass. In the case of the primary aquifer on this site, the opened trial holes indicate an abrupt transition from the topmost soil horizons to the shallow bedrocks in the lower profile with groundwater perched on top of these practically impermeable materials. The perched and secondary aquifer are recharged by rainfall.

- **Evaluation of surficial materials for possible use for pipe bedding: (SABS 1200 DB & LB)**

- (i) Select Granular Bedding – i.e. naturally occurring non-cohesive singularly graded gravel-soils between 0.6 and 19.0 mm are not available on this site and will need to be imported.
- (ii) Select Fill – i.e. the laboratory tests results indicate that natural soils with a PI less than 6 are available with selection from soil types in the profile.
- (iii) General Fill: materials recovered from trench excavation works may be considered for General Fill purposes after removal of all the larger cobble and boulder size fractions.

- **Evaluation of Potential aggressiveness of interparticulate groundwaters:**

Disturbed samples of the transported and residual soils encountered in the opened trial holes across this site were subjected to chemical tests. The test results are provided in Appendix 2.

Our assessment of these values is as follows:-

| Soil Unit | pH | Comment | Resistivity ohm.cm. | Comment ² |
|---|------------|-----------------|---------------------|----------------------|
| Hillwash | 6.5 to 6.6 | Slightly acidic | 654 to 538 | Very corrosive |
| Pebble Marker | 6.1 to 6.6 | Slightly acidic | 452 to 538 | Very corrosive |
| Comment : 1a., corrosivity in relation to underground ferrous materials ref. Messrs. Amco 1977) | | | | |

- **Evaluation of Potential erosion and piping (dispersive soils)**

When soil types are subjected to hydraulic gradient Sodium-based clay minerals are susceptible to erosion or piping in the insitu soil profile. The electrical conductivity of the soil paste provides an indicator of the salinity and potential dispersive behaviour. The conductivity results are provided in Table 2.

Our assessment of these values is as follows :

| Soil Unit | Conductivity Sm | Dispersive Characteristic |
|--|-----------------|---------------------------|
| Hillwash | 0.15 to 0.19 | Non-associated |
| Pebble Marker | 0.19 to 0.22 | Non-associated |
| Note : Conductivity in excess of 0.5 Sm may be associated with dispersive characteristics. | | |

Urban Geological Investigations" with appropriate adaptations. Based on the geological, geohydrological, hydrological, geomorphological and soils information gathered during geotechnical investigations, sites may be divided into three primary Geotechnical Sub-Areas. These Sub-Areas broadly reflect the development potential of sites and delineate Sub-Areas of similar characteristics (such as wet areas and terrain) and do not necessarily reflect a typical (singular) soil profile overlying the bedrock.

These broad geotechnical Sub-Areas are defined below:-

| Geotechnical Sub-Area | Definition |
|-----------------------|---|
| 1 (or prefix "1") | The geotechnical conditions are such that urban development can take place without any special precautionary/remedial measures for geotechnical conditions. |
| 2 (or prefix "2") | Geotechnical conditions are such that the area may be developed for urban use but appropriate remedial and/or precautionary measures are required in the context of the geotechnical constraints. |
| 3 (or prefix "3") | Geotechnical conditions are such that urban development is not recommended. |

Based on our evaluation of the available geotechnical data, the site area has been delineated into:- These primary Geotechnical Sub-Areas as shown on drawing IR977 Site 1.

7. SITE CLASSIFICATION (IN TERMS OF THE NHBC GUIDELINES)

The broad geotechnical characteristics of the primary geotechnical Sub-Area outlined in Section 6.4 are further described in terms of several 'geotechnical category designations' defined below:

| GEOTECHNICAL CATEGORY AND SITE CLASS DESIGNATION | GEOTECHNICAL CHARACTERISTICS |
|--|---|
| Wet areas W | Drainage line, seepage zone. (potential for moisture rise below buildings) |
| Active soils (swell/shrink) H H1 H2 H3 | Expected range of total movements at surface: < 7.5mm 7.5 - 15mm 15 - 30mm > 30mm |

'movement' under the foundations of houses placed on these particular soil profiles. In an attempt to quantify these movements for this report, our experience with similar soils, together with Weston's empirical equation, has been adapted to provide an indication of the swell difference between the projected 'driest' and 'wettest' moisture conditions anticipated in the field, see Footnote².

The laboratory testing of soil samples taken across the site provides average liquid limit (whole) values for the various near surface materials. These values, together with the potential volume changes (swell difference between the presumed 'driest' and 'wettest' field moisture conditions) are tabulated below :-

| MATERIAL | L.L. WHOLE (mean values) | MOISTURE CONTENT % | | SWELL DIFF. VOL. CHANGE % |
|-------------------|-----------------------------|--------------------|-----------|---------------------------------------|
| | | 'DRIEST' | 'WETTEST' | |
| Hillwash | 21.0 | 8.4 | 16.8 | 0.2 |
| Pebble Marker | 7.5 | 3.0 | 6.0 | <0.1 |
| Res. Res. Granite | 14.4 | 5.8 | 11.5 | <0.1 |
| Res. Res. Diabase | 28.0 | 11.2 | 22.4 | 0.5 |
| Res. Granite | 16.0 | 6.4 | 12.8 | <0.1 |
| Res. Diabase | 33.0 | 13.2 | 33.8 | 0.8 |

- (ii) Soils uncovered that could rapidly reduce in volume when loaded and wetted - potential 'collapsible' soils (i.e. NHBC Site Classes C/C1/C2).

'Loose' to 'medium dense' materials have been uncovered in trial hole profiles across this site. Collapse potential (CP_{200}) tests carried out on samples of these materials indicate 'trouble' to 'moderate trouble' for these materials in profile in regard to the appropriate rating category (ref. Jennings J.E. & Knight K 1975).

On the purposes of this report and on the basis of the test results, a 1 per cent collapse/reduction has been applied to profile thicknesses in the assessment of these materials.

Once analysed according to the assumptions and data provided, the individual trial hole designations have been transferred onto the site plan provided and reviewed in conjunction with other geotechnical information including the (solid) geology, engineering judgement and the results of field scouting.

A Soils Map (Drawing IR977 Site 1) has been compiled reflecting this total conceptual Site Class Sub-Area characterisation.

Footnote 2: Weston's swell percent = $0.0004(1L)^{4.7} \times p^{0.289} \times W^{0.38}$
 where L = Liquid Limit (whole) (ie. Liquid Limit x % passing 425 microns)
 P = overburden pressure (10)Pa adopted for this report
 W = initial moisture content.

From C&R research experience (for 'red' soils), the 'driest' field moisture condition has been taken as 0.4 L, and the 'wettest' field moisture condition as 0.8 L. For the 'dark grey' and 'black' soils 'driest' and 'wettest' conditions have been taken as 0.2L and 0.7L respectively.

11. CONCLUSIONS

The following notes are intended as general recommendations/guidance for the development of this site :-

11.1 Foundation Works

Broad recommendations are provided in **Section 8**. Site specific investigations must be conducted on any sites planned for major structures.

As this site lies near previous mined out sub-strata it will be subject to possible earth (seismic) tremors. Buildings should be structurally designed to minimise the potential damage caused by such events.

11.2 Road Construction and Installation of Underground Services.

The laboratory test results indicate a general rating of fair subgrade materials across this site. These insitu materials will require (appropriate) compaction before being incorporated into any road pavement layers.

SABS 1200D 'intermediate' excavation conditions should be anticipated in sections of the site as well as some degree of hard rock where sub outcrop and boulder conditions exist. The impermeable nature of the bedrock materials near-surface over sections of the site could cause shallow standing water and spring conditions in excavation works during and after periods of heavy rain.

The lateral stability of any open trenchworks exceeding 1.5m in depth must be carefully assessed on site and adequate temporary shoring works installed to ensure the safety of construction workers.

Selected granular bedding will need to be imported to these Works.

Non-ferrous materials should be used in any underground service works.

11.3 Near surface conditions recorded on the Soil Map (IR977 Site 1)

Our assessment of the near surface conditions recorded on the Soil Map is summarised as follows: -

| Sub area of Soil Map | Area Ha | Assessment/ Anticipated near surface soil conditions |
|------------------------|---------|---|
| 2(R3) [H-H1/C-C1/S] | 36,8 | The site area will require general clearance works to remove old buildings/structures, swimming pool, rubble etc. Once cleared the following (near surface) ground conditions should be anticipated:- possible difficult excavation conditions (R3) in 0.0 to 1.5m depth (and below), potentially swell/shrink (H-H1) and potentially collapsible (C-C1) soils in near surface profile. |

FIGURES

LOCALITY PLAN : IR977

FIGURE 1

TABLES

| | |
|---|----------------|
| SUMMARISED REFUSAL / GROUNDWATER DEPTHS | TABLE 1 |
| SUMMARIES OF LABORATORY TEST RESULTS (DISTURBED) | TABLE 2 |
| SUMMARIES OF LABORATORY TEST RESULTS (UNDISTURBED) | TABLE 3 |

Job: SITE 1-REM.P1n 22 BULTFOONTEIN 633JQ and P1n 164 HOOTGEDAGHT 52AQ IR977

TABLE 2 : SUMMARIES OF LABORATORY TEST RESULTS (DISTURBED/UNDISTURBED SAMPLES)

| TP No | Depth (m) | Soil Unit | LL | PI (425) | LS (%) | GM | D ₅₀ /D ₁₀ | F ₁₅ | LL _w | 425 (%) | 002 (%) | pH | Resistivity Ohm.m | PRA | UCS |
|-------|-----------|-------------------|----|----------|--------|-------|----------------------------------|-----------------|-----------------|---------|---------|------|-------------------|-------|-------|
| 2/1 | 0.8 | Hillwash | 34 | 15 | 6.0 | 1.120 | 2500 | 9 | 21 | 62.3 | 20 | | | A-0 | CL |
| 4/1 | 0.5 | Pebble Marker | 17 | 5 | 2.7 | 1.258 | 422 | 3 | 10 | 54.4 | 11 | 6.60 | 5.38 | A-2-4 | SM-60 |
| 10/1 | 0.5 | Pebble Marker | 21 | 10 | 4.0 | 2.236 | 190 | 2 | 5 | 24.7 | 7 | 6.11 | 6.38 | A-2-4 | SC |
| 1/1 | 0.4 | Raw. Res. Granite | 18 | 4 | 1.3 | 2.252 | 153 | 1 | 4 | 24.6 | 5 | 6.59 | 6.54 | A-1-8 | GM-GC |
| 3/1 | 0.8 | Raw. Res. Granite | 34 | 14 | 6.7 | 1.288 | 1100 | 8 | 16 | 54.0 | 20 | | | A-6 | SC |
| 7/1 | 1.5 | Raw. Res. Granite | 30 | 13 | 6.0 | 0.925 | 933 | 9 | 21 | 66.4 | 17 | | | A-6 | SC |
| 9/1 | 1.5 | Raw. Res. Granite | 30 | 13 | 6.0 | 0.816 | 690 | 9 | 22 | 72.4 | 20 | | | A-8 | CL |
| 14/1 | 1.0 | Raw. Res. Granite | 28 | 11 | 5.3 | 2.211 | 800 | 3 | 7 | 28.3 | 9 | 6.67 | 4.52 | A-2-6 | GC |
| 5/1 | 0.7 | Raw. Res. Diabase | 40 | 20 | 12.7 | 0.802 | 1600 | 14 | 28 | 69.1 | 30 | | | A-8 | CL |
| 1/1 | 1.2 | Res. Granite | 31 | 12 | 6.0 | 1.365 | 1500 | 6 | 16 | 51.8 | 13 | | | A-8 | SC |
| 4/1 | 1.6 | Res. Granite | 28 | 9 | 4.7 | 1.183 | 1200 | 5 | 14 | 53.8 | 17 | | | A-4 | SC |
| 8/1 | 1.6 | Res. Granite | 30 | 12 | 4.7 | 1.069 | 85 | 7 | 18 | 61.1 | 11 | | | A-2-6 | SC |
| 2/1 | 1.8 | Res. Diabase | 41 | 21 | 6.7 | 0.851 | 1200 | 15 | 29 | 71.4 | 21 | | | A-7-6 | CL |
| 10/1 | 1.5 | Res. Diabase | 45 | 27 | 8.0 | 0.921 | 600 | 22 | 37 | 82.4 | 48 | | | A-7-6 | CL |

KEY
 LL Liquid limit
 PI(425) Plasticity Index of sample fine portion
 LS Linear Shrinkage
 425 (%) Percentage passing 425
 USC Unified Soil Classification
 LL_w Liquid Limit of whole sample (LL x passing 425)
 002 (%) Percentage passing 0.075mm

GM Grading Modulus
 PL Plasticity Index of whole sample (PI x passing 425)
 NMC Natural moisture content
 PRA Public Roads Administration Classification
 Ohm.m Resistivity
 Cond. Conductivity Sm
 D₅₀/D₁₀ Ratio of Particle diameter corresponding to 65% and 15%

DRAWING

SOIL MAP (NHBRC)

IR977 Site 1

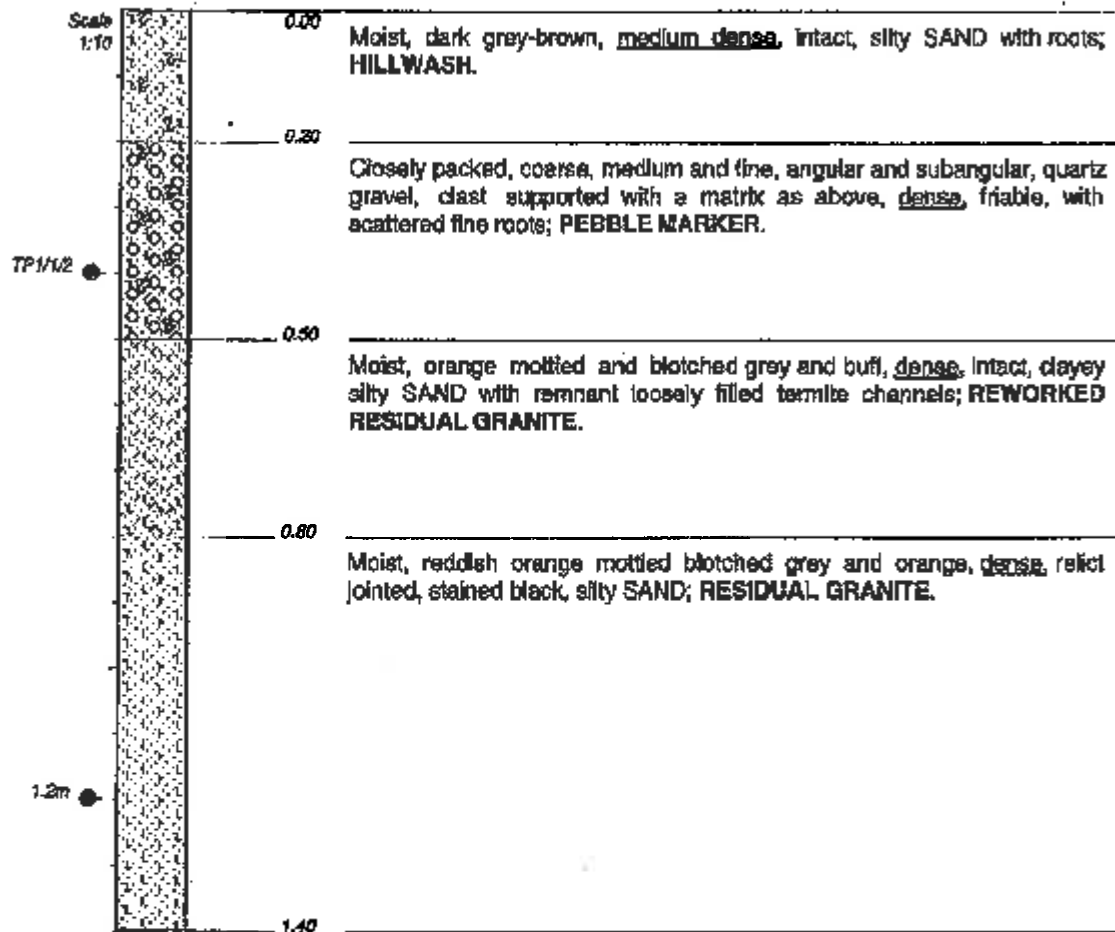
APPENDICES

TRIAL HOLE PROFILES

APPENDIX 1

LABORATORY TEST RESULTS

APPENDIX 2



NOTES

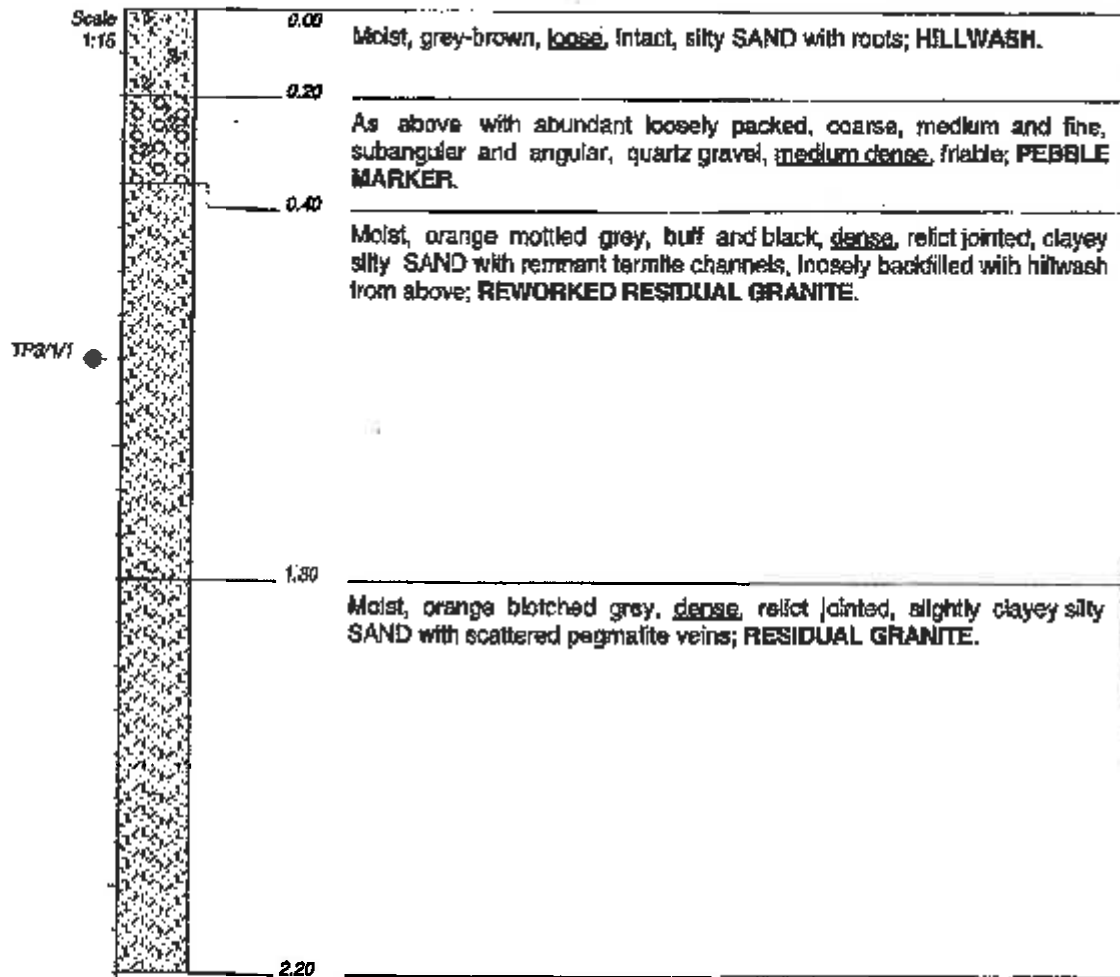
- 1) Refusal at 1.4m on very dense granite.
- 2) No water encountered.
- 3) Disturbed sample TP1/1/1 taken at 0.4m and TP1/1/2 taken at 1.2m.
- 4) Profile contains pockets of closely jointed soft medium hard rock granite from 0.8m.

CONTRACTOR: Geoid
 MACHINE: Bell31SSG
 DRILLED BY: Phillip
 PROFILED BY: BB
 TYPE SET BY:
 SETUP FILE: Y.SET

INCLINATION:
 DIAM:
 DATE: 20 April 2010
 DATE: 20 April 2010
 DATE: 20/04/10 14:13
 TEXT: ...IR977_1.TXT

ELEVATION:
 X-COORD: X2878574
 Y-COORD: Y-093169

HOLE No: TP1/1



NOTES

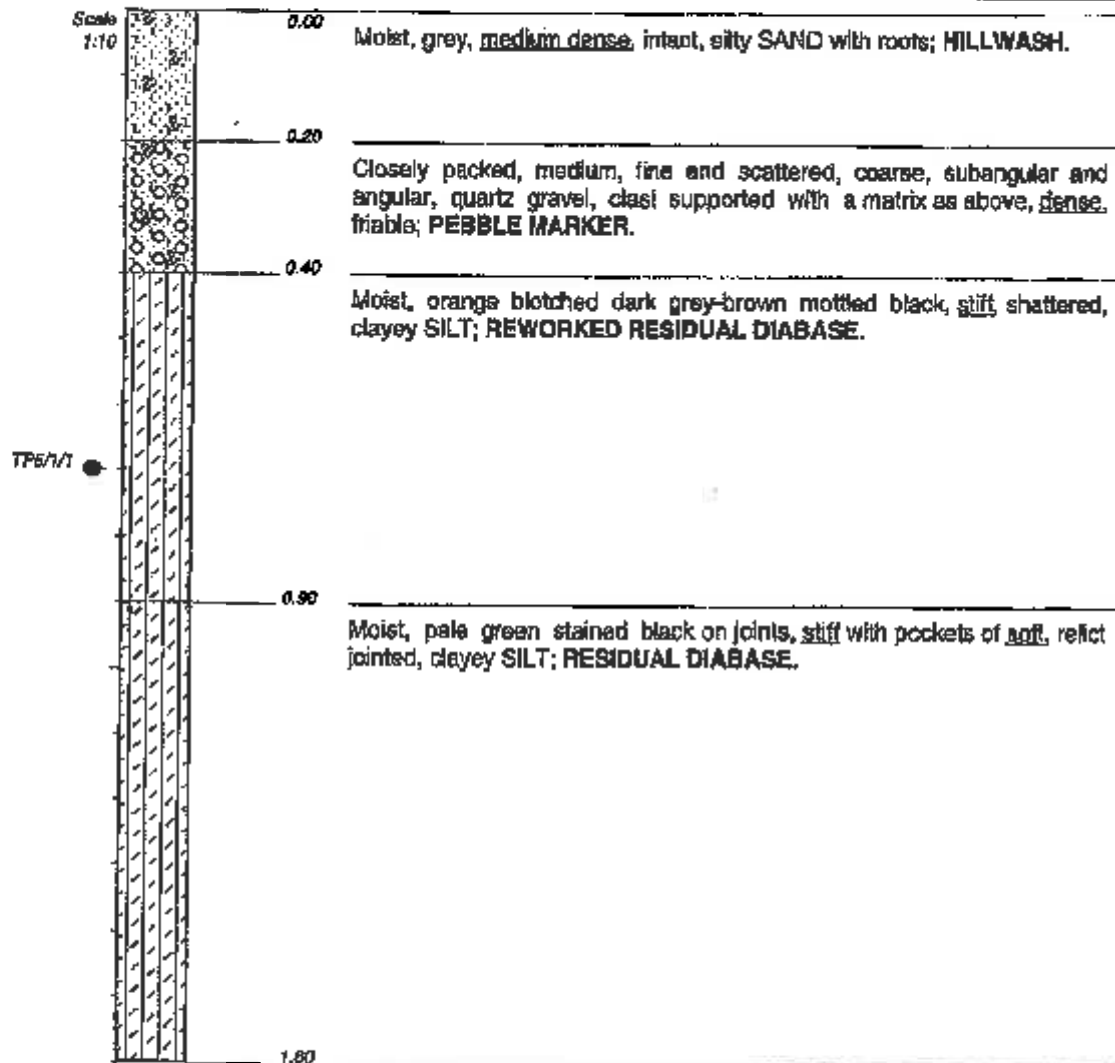
- 1) Refusal on very dense granite as above at 2.2m.
- 2) No water encountered.
- 3) Disturbed sample TP3/1/1 taken at 0.8m.

CONTRACTOR: Geoid
 MACHINE: Bell315SG
 DRILLED BY: Philip
 PROFILED BY: BB

INCLINATION:
 DIAM:
 DATE: 20 April 2010
 DATE: 20 April 2010
 DATE: 22/04/10 14:13
 TEXT: ..IR977-1.TXT

ELEVATION:
 X-COORD: X2873782
 Y-COORD: 27 Y-092908

HOLE No: TP3/1



NOTES

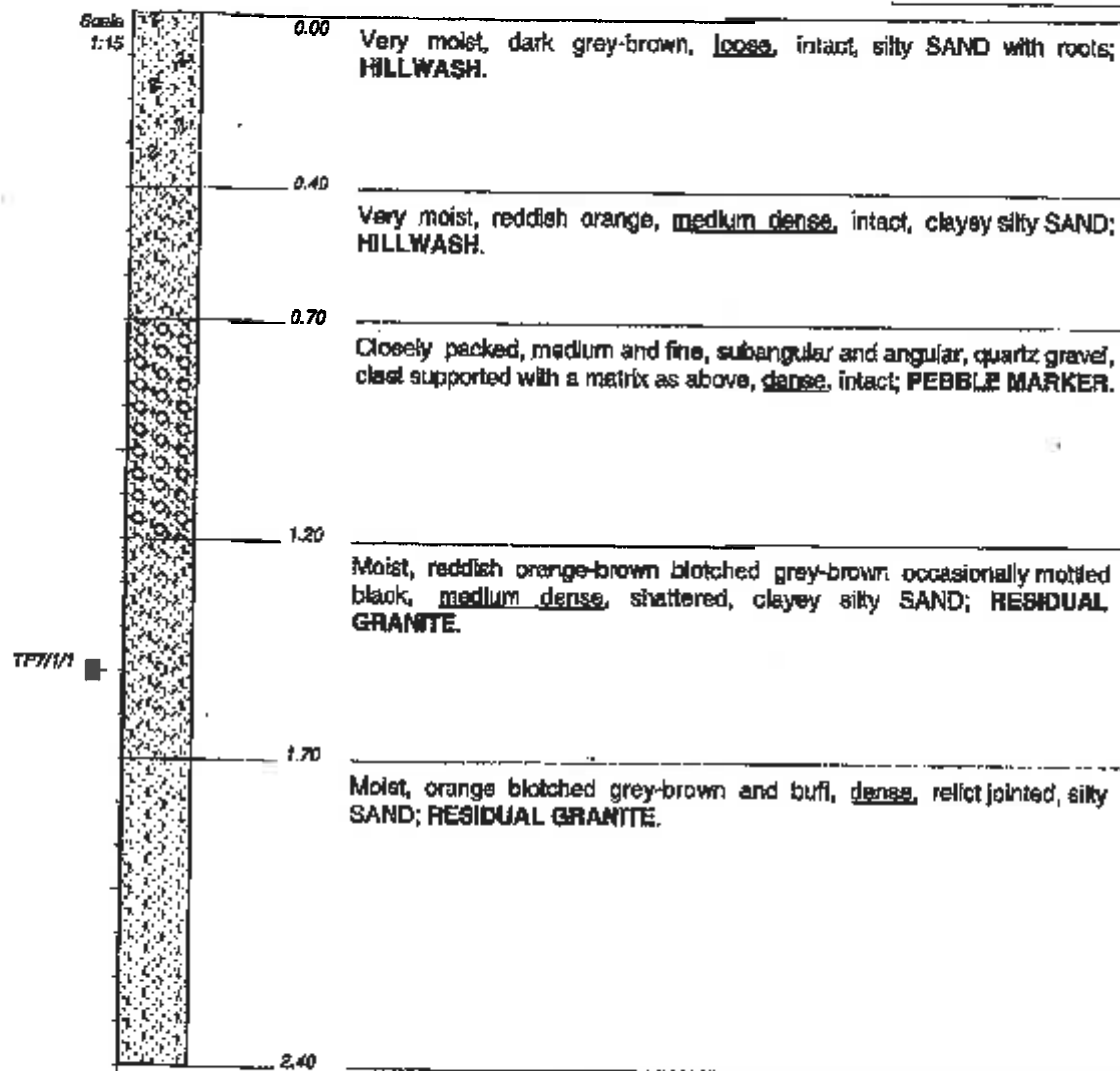
- 1) Refusal on soft rock diabase at 1.6m.
- 2) No water encountered.
- 3) Disturbed sample TP5/1/1 taken at 0.7m.

CONTRACTOR: Geold
 MACHINE: Bell315SG
 DRILLED BY: Phillip
 PROFILED BY: BB
 TYPE SET BY:
 SETUP FILE: Y.SET
 DOB: JONES & WAGENER

INCLINATION:
 DIAM:
 DATE: 20 April 2010
 DATE: 20 April 2010
 DATE: 29/04/10 14:13
 TEXT: ..\BDD\INTRAVR977_1.TXT

ELEVATION:
 X-COORD: X2873976
 Y-COORD: 27 Y-082757

HOLE No: TP5/1



NOTES

- 1) Refusal on very dense granite at 2.4m.
- 2) No water encountered.
- 3) Undisturbed sample TP7/1 taken at 1.5m.

CONTRACTOR: Geoid
MACHINE: Bell315SG
DRILLED BY: Phillip
PROFILED BY: BS

TYPE SET BY:
SETUP FILE: Y.SET

INCLINATION:

DIAM:
DATE: 20 April 2010
DATE: 20 April 2010
DATE: 2004/10 14:13
TEXT: .188INTRAPR977_-1.TXT

ELEVATION:

X-COORD: X2674095
Y-COORD: 27 Y-082676

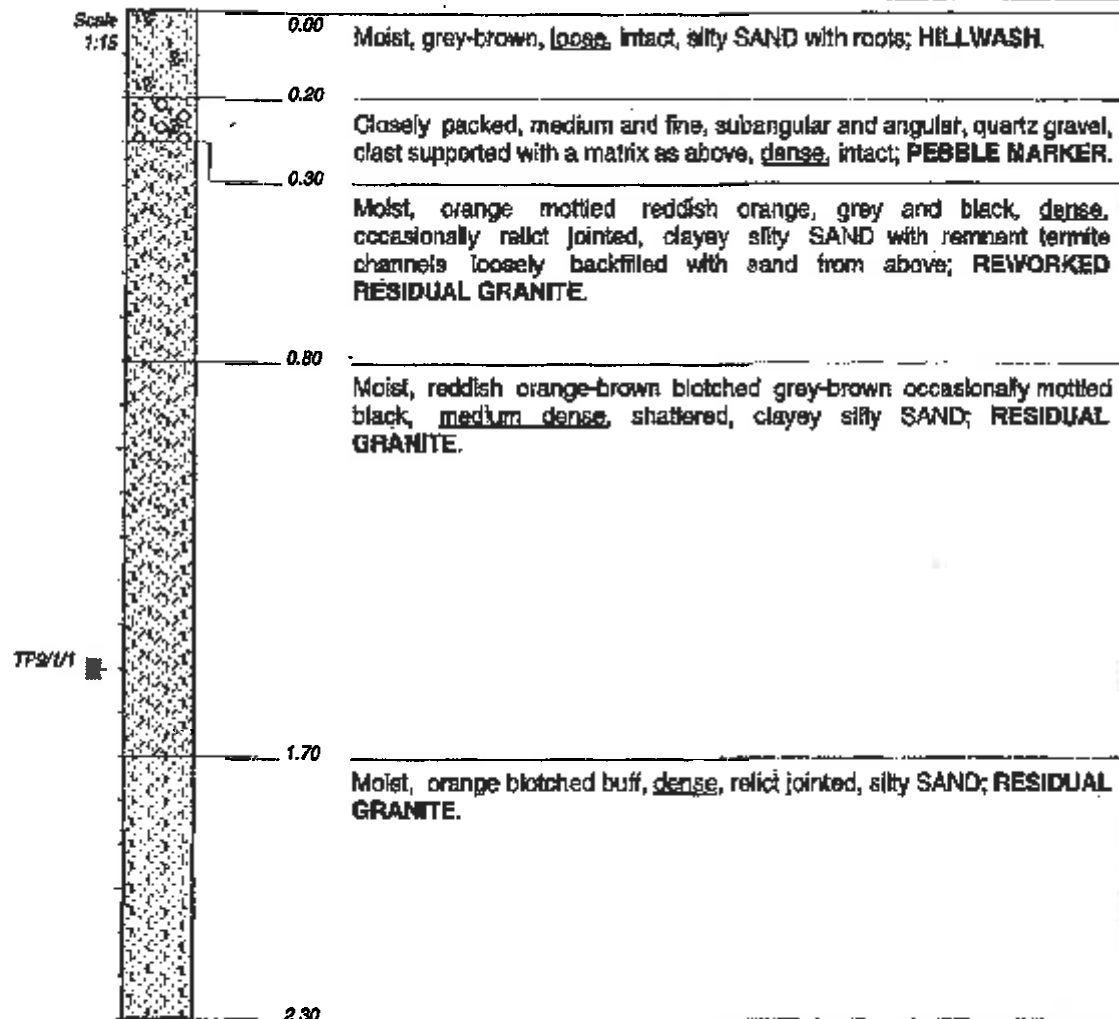
SOLE No: TP7/1

INTRACONSULTConsulting Engineers & Geologists
Tel: (011) 469-0854Site 1 - Rem. Ptn 22 Bufffontein 533JQ
and Ptn164 Nootgedacht 524IQ

HOLE No: TP9/1

Sheet 1 of 1

JOB NUMBER: IR977

**NOTES**

- 1) No refusal continues in the above.
- 2) No water encountered.
- 3) Undisturbed sample TP9/1/1 taken at 1.5m.

CONTRACTOR: Geoid
MACHINE: Bell315SG
DRILLED BY: Phillip
PROFILED BY: BB

TYPE SET BY:
SETUP FILE: Y.SET

INCLINATION:

DIAM:
DATE: 20 April 2010
DATE: 20 April 2010

DATE: 2004/10 14:13
TEXT: .JBB\INTRAVR977_-1.TXT

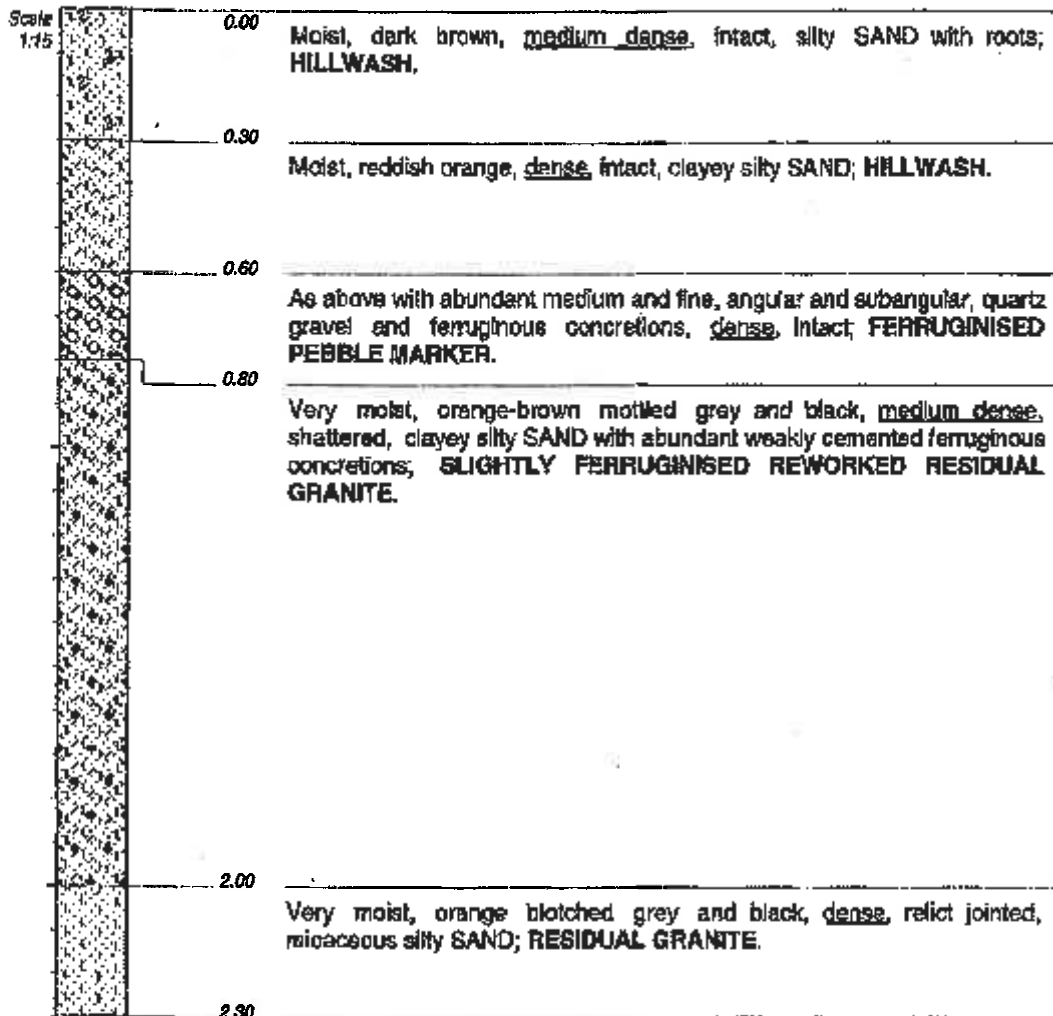
ELEVATION:

X-COORD: X2873981
Y-COORD: 27 Y-092510

HOLE No: TP9/1

0081 JONES & WAGENER

D&L PLOT 6000 J&W



NOTES

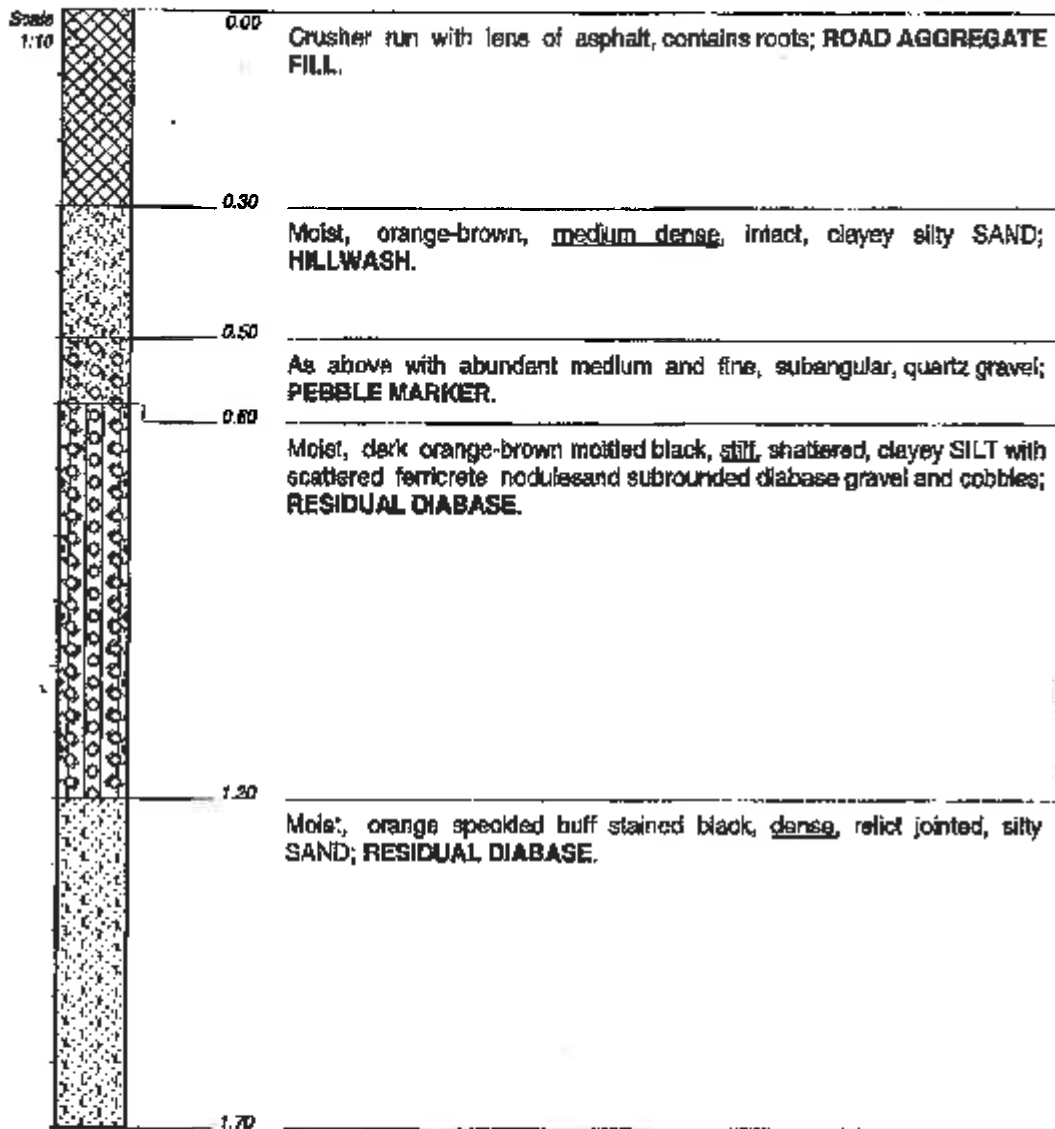
- 1) No refusal continues in the above.
- 2) No water encountered.

CONTRACTOR: Geoid
 MACHINE: BellS15SG
 DRILLED BY: Phillip
 PROFILED BY: BB
 TYPE SET BY:
 SETUP FILE: Y.SET

INCLINATION:
 DIAM:
 DATE: 20 April 2010
 DATE: 20 April 2010
 DATE: 20/04/10 14:19
 TEXT: .\BBS\INTRA\R977_1.TXT

ELEVATION:
 X-COORD: X2873863
 Y-COORD: 27 Y-092477

HOLE No: TP11/1



NOTES

- 1) Refusal on dark grey speckled white stained orange highly weathered very closely jointed hard rock diabase.
- 2) No water encountered.

CONTRACTOR : Geoid
 MACHINE : BelB15SG
 DRILLED BY : Philip
 PROFILED BY : BB
 TYPE SET BY :
 SETUP FILE : Y.SET

INCLINATION :
 DIAM :
 DATE : 20 April 2010
 DATE : 20 April 2010
 DATE : 28/04/10 14:13
 TEXT : ..\BENINTRAUF977_-1.TXT

ELEVATION :
 X-COORD : X2873652
 Y-COORD : Z7 Y-092556

HOLE No: TP13/1

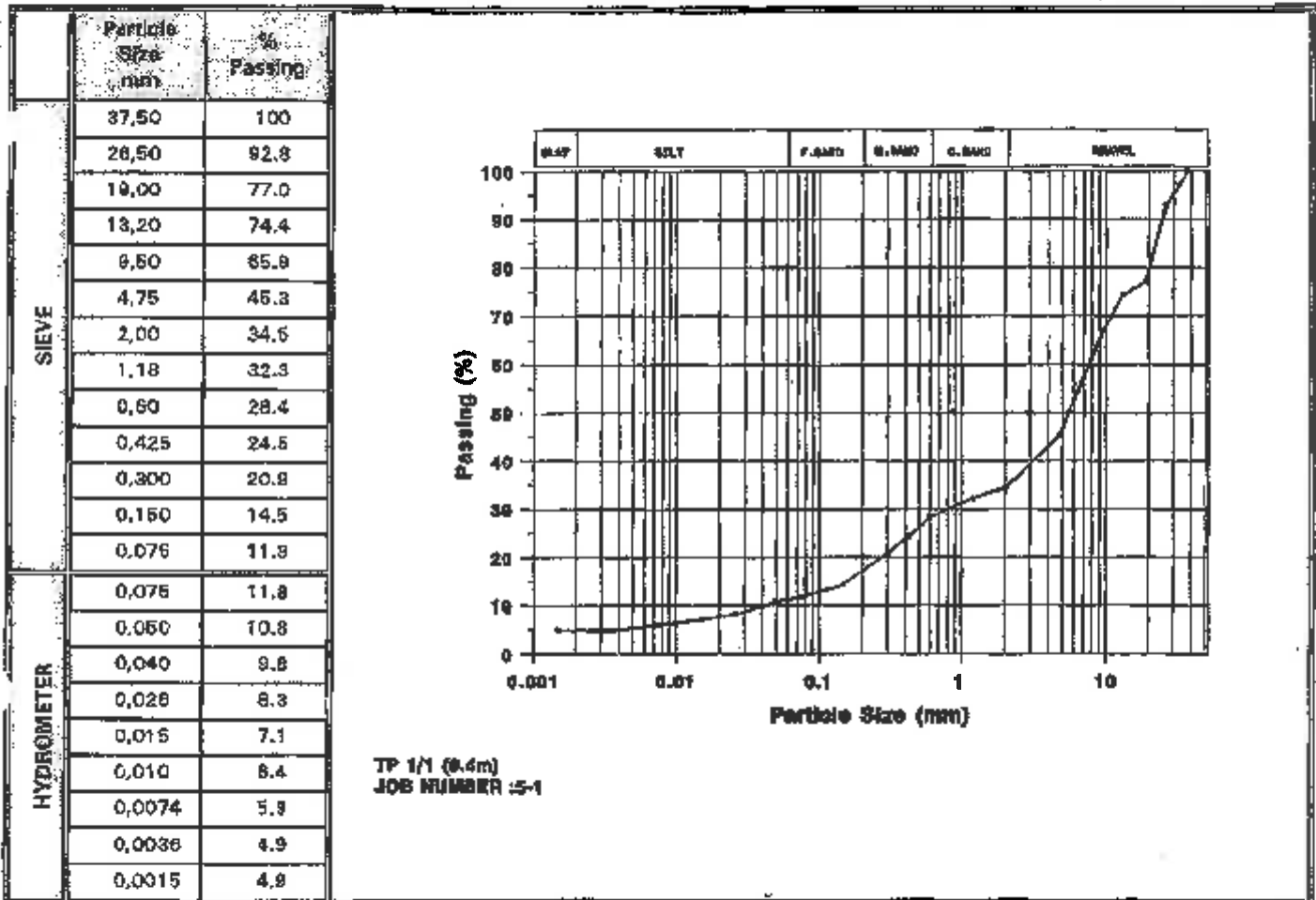
APPENDIX 2

Laboratory Test Results

Indicator Test Results

| Client Details | | TWR Details | |
|-----------------|---|-------------|------------|
| Name | INTRACONSULT ASSOCIATES | Job No. | 5 |
| Project | SITE1-BULTFONTBEIN and NOOITGEDACHT-IR977 | Date | 12-05-2010 |
| Reference | DR G A HALL | Technician | B KAU |
| Order No. | | Checked by | F THAIMO |
| Sample Details | | | |
| Sample Location | TP 1/1 | Depth (m) | 0.4 |
| | | Lab Sample | 5-1 |

GRADING ANALYSIS



ATTERBERG LIMITS

| Liquid Limit LL | Plastic Limit PL | Plasticity Index PI | Linear Shrinkage LS |
|--------------------|---------------------|------------------------|------------------------|
| 18 | 14 | 4 | 1.3 |

TWR

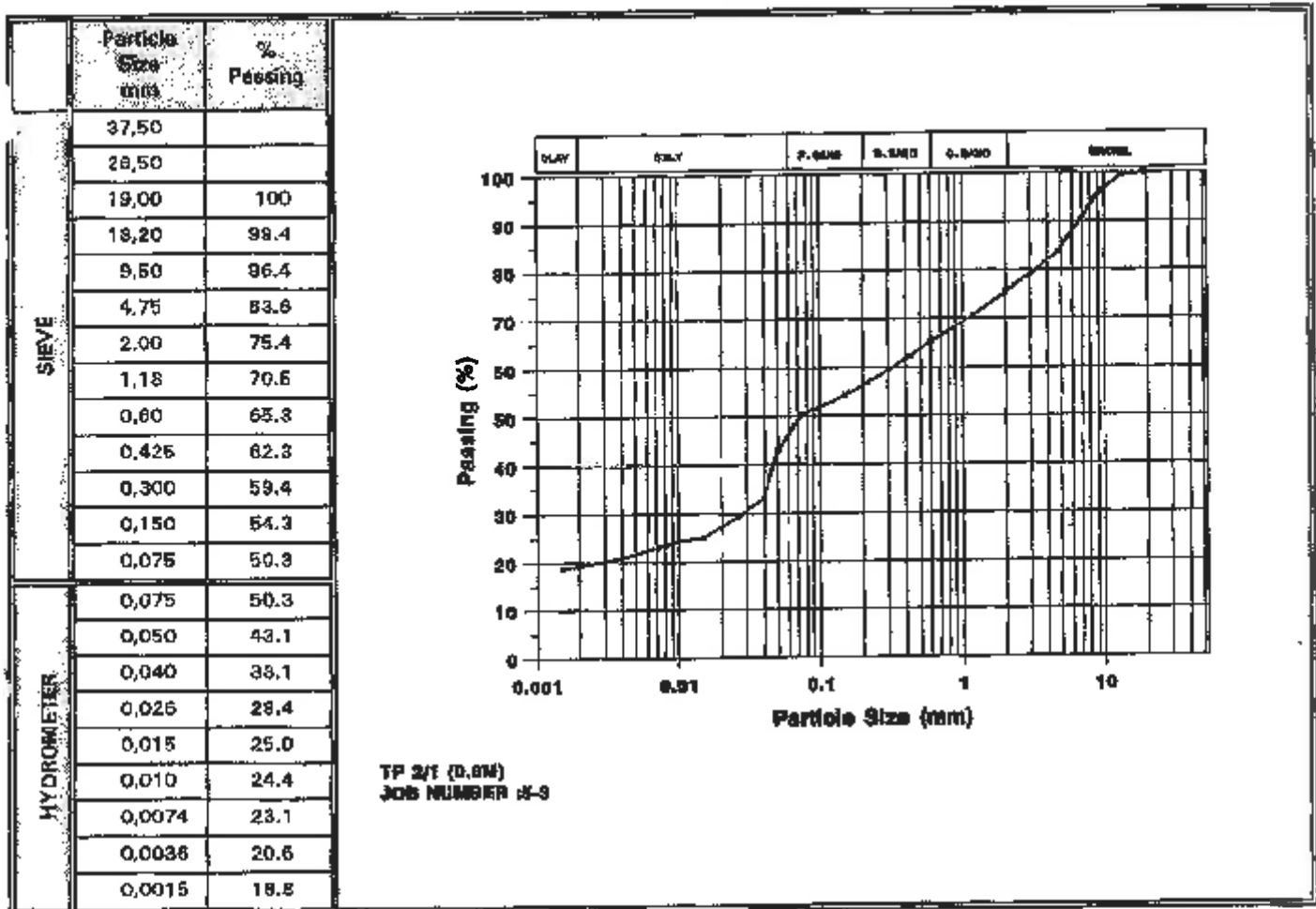
SCHOOL OF CIVIL ENGINEERING

P.O. Box 17011 Doornfontein 2028 37 Nind Street Doornfontein Tel. (011) 406-2187 Fax. (011) 406-2172

Indicator Test Results

| Client Details | | TWR Details | |
|-----------------|--|-------------|------------|
| Name | INTRACONSULT ASSOCIATES | Job No. | 5 |
| Project | SITE1 BULFRONTEIN and NOOITGEDACHT-IR977 | Date | 12-05-2010 |
| Reference | DR G A HALL | Technician | B KAU |
| Order No. | | Checked by | F THAIMO |
| Sample Details | | | |
| Sample Location | 2/1 | Depth (m) | 0.8 |
| | | Lab Sample | 5-3 |

GRADING ANALYSIS



ATTERBERG LIMITS

| Liquid Limit LL | Plastic Limit PL | Plasticity Index PI | Linear Shrinkage LS |
|--------------------|---------------------|------------------------|------------------------|
| 34 | 19 | 15 | 6.0 |

TWR

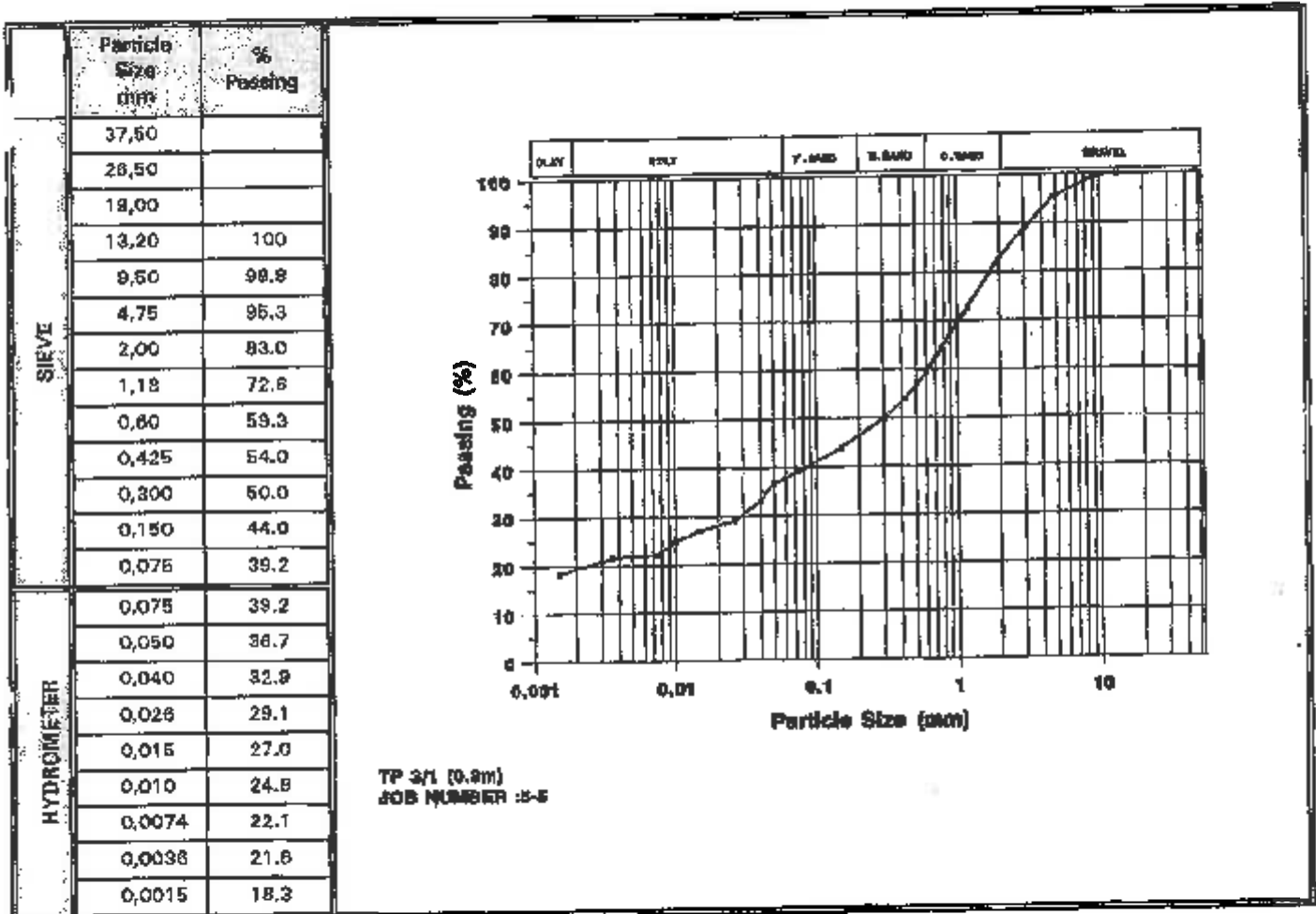
SCHOOL OF CIVIL ENGINEERING

P.O. Box 17011, Doornfontein, 2029 37 Nind Street Doornfontein Tel. (011) 406-2167 Fax. (011) 406-2172

Indicator Test Results

| Client Details | | TWR Details | |
|----------------|--|-------------|------------|
| Name | INTRACONSULT ASSOCIATES | Job No. | 5 |
| Project | SITE1-BULTFONTEIN and NOOFTGEDACHT-IR977 | Date | 12-05-2010 |
| Reference | DR G A HALL | Technician | B KAU |
| Order No. | | Checked by | F THAIMO |
| Sample Details | | | |
| Sample | TP 3/1 | Depth (m) | 0.8 |
| | | Lab Sample | 5-5 |

GRADING ANALYSIS



ATTERBERG LIMITS

| Liquid Limit LL | Plastic Limit PL | Plasticity Index PI | Linear Shrinkage LS |
|--------------------|---------------------|------------------------|------------------------|
| 34 | 20 | 14 | 6.7 |

TWR

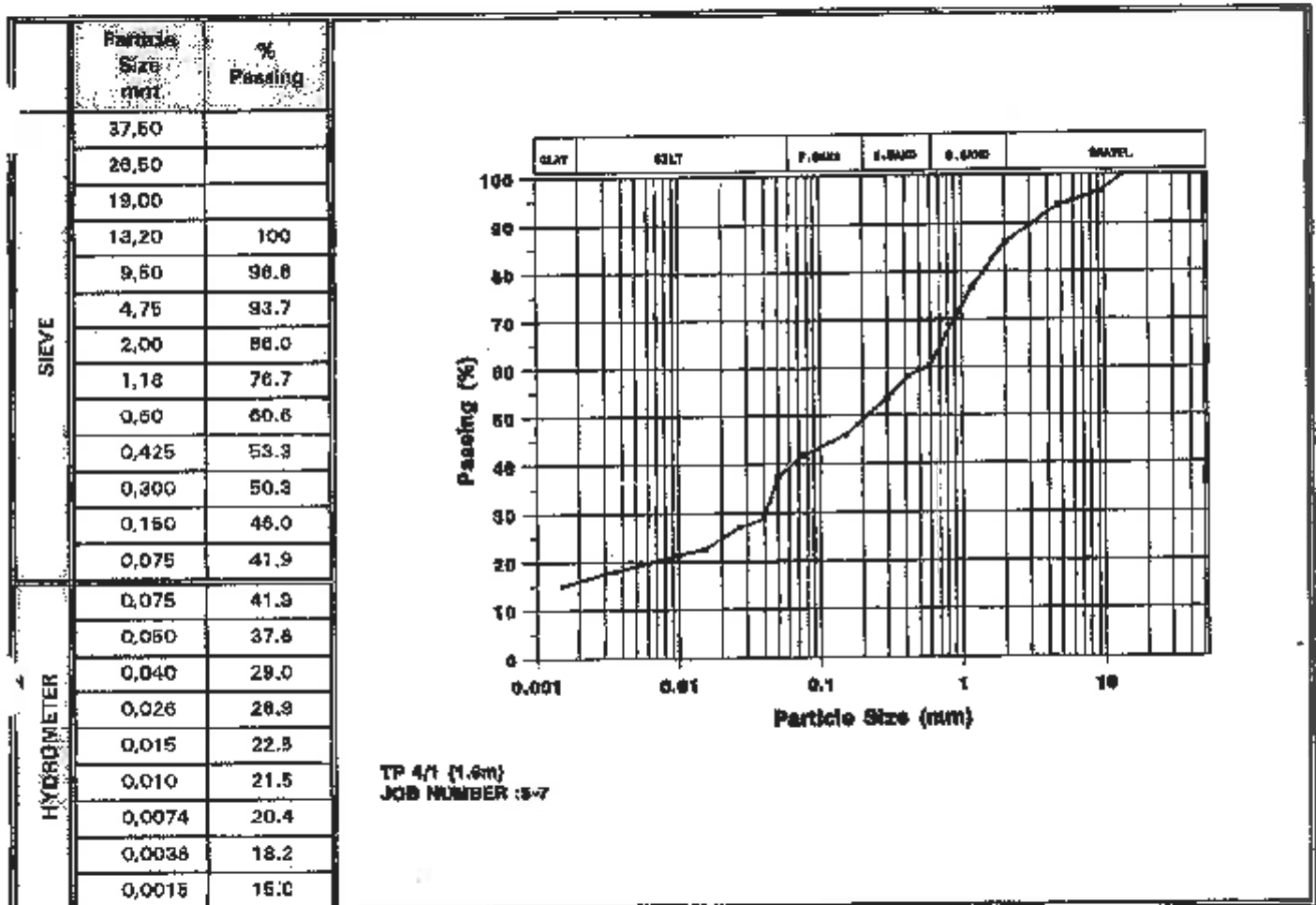
SCHOOL OF CIVIL ENGINEERING

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Indicator Test Results

| Client Details | | TWR Details | |
|-----------------|--|----------------|------------|
| Name | INTRACONSULT ASSOCIATES | Job No. | S |
| Project | SITE1-BULTFONTEIN and NOOITGEDACHT-IR977 | Date | 12-05-2010 |
| Reference | | Technician | B KAU |
| Order No. | | Checked by | F THAIMO |
| Sample Details | | | |
| Sample Location | TP 4/1 | Depth (m) | 1.6 |
| | | Lab Sample No. | 5-7 |

GRADING ANALYSIS



ATTERBERG LIMITS

| Liquid Limit LL | Plastic Limit PL | Plasticity Index PI | Linear Shrinkage LS |
|--------------------|---------------------|------------------------|------------------------|
| 26 | 17 | 9 | 4.7 |

TWR

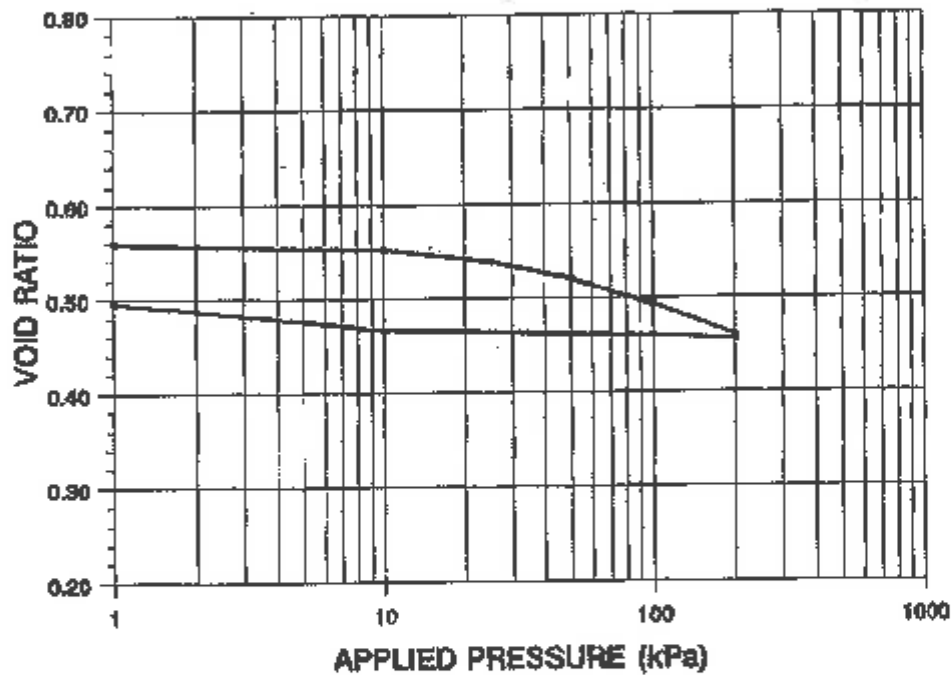
SCHOOL OF CIVIL ENGINEERING

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Consolidometer Results

| Client Details | | TWR Details | |
|-----------------|--|----------------|------------|
| Name | INTRACONSULT ASSOCIATES | Job No. | 5 |
| Project | SITBI-BULTFONTEIN and NOOITGEDACHT-IR977 | Date | 12-05-2010 |
| Reference | DR G A HALL | Technician | F THAIMO |
| Order No. | | Checked by | F THAIMO |
| Sample Details | | | |
| Sample Location | TP 6/1 | Depth (m) | 1.8 |
| | | Lab Sample No. | 5-9 |

Res. Granite



TP 6/1 (1.8m)
Lab Sample No. 5-9

| Dry Density (kg/m ³) | Initial Moisture Content (%) | Final Moisture Content (%) | Initial Degree of Saturation (%) | Final Degree of Saturation (%) | Specific Gravity (G _s) | L _v | M _v | C _v |
|----------------------------------|------------------------------|----------------------------|----------------------------------|--------------------------------|------------------------------------|----------------|----------------|----------------|
| 1698 | 17.0 | 18.7 | 80 | 100 | 2.647 | 30 | 12 | 4.7 |

| Applied Pressure (kPa) | 0 | 10 | 25 | 50 | 100 | 200 | 200 | 100 | 10 | 0 | | | | |
|--------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|---|--|--|--|--|
| Void Ratio (e _{min}) | 0.539 | 0.552 | 0.539 | 0.520 | 0.493 | 0.460 | | | | | | | | |
| Void Ratio (e _{max}) | | | | | | 0.456 | 0.460 | 0.467 | 0.496 | | | | | |

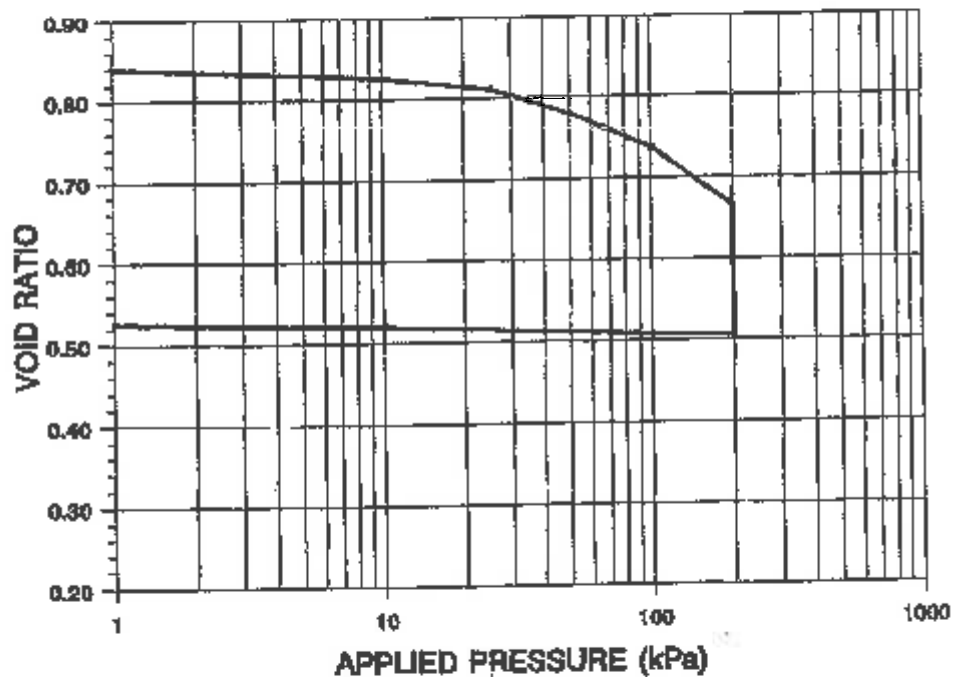
TWR

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Consolidometer Results

| Client Details | | TWR Details | |
|-----------------|--|----------------|------------|
| Name | INTRACONSULT ASSOCIATES | Job No. | 5 |
| Project | SITE1-BULTFONTEIN and NOOITGEDACHT-IR977 | Date | 12-05-2010 |
| Reference | DR G A HALL | Technician | F THAIMO |
| Order No. | | Checked by | F THAIMO |
| Sample Details | | | |
| Sample Location | TP 7/1 | Depth (m) | 1.5 |
| | | Lab Sample No. | 5-10 |



TP 7/1 (1.5m)
Lab Sample No. 5-10

| Dry Density (kg/m ³) | W ₁₀₀ Moisture Content (%) | Final Moisture Content (%) | Initial Degree of Saturation (%) | Final Degree of Saturation (%) | Specific Gravity (G _s) | L ₁ | L ₂ | L ₃ |
|----------------------------------|---------------------------------------|----------------------------|----------------------------------|--------------------------------|------------------------------------|----------------|----------------|----------------|
| 1443 | 13.9 | 19.8 | 44 | 100 | 2.653 | 50 | 15 | 6.0 |

| Applied Pressure (kPa) | 0 | 10 | 25 | 50 | 100 | 200 | 300 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 |
|------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-----|-----|-----|------|
| Void Ratio (mm) | 0.840 | 0.826 | 0.811 | 0.780 | 0.737 | 0.664 | | | | | | | | |
| Void Ratio (mm) | | | | | | | 0.505 | 0.506 | 0.520 | 0.526 | | | | |

TWR

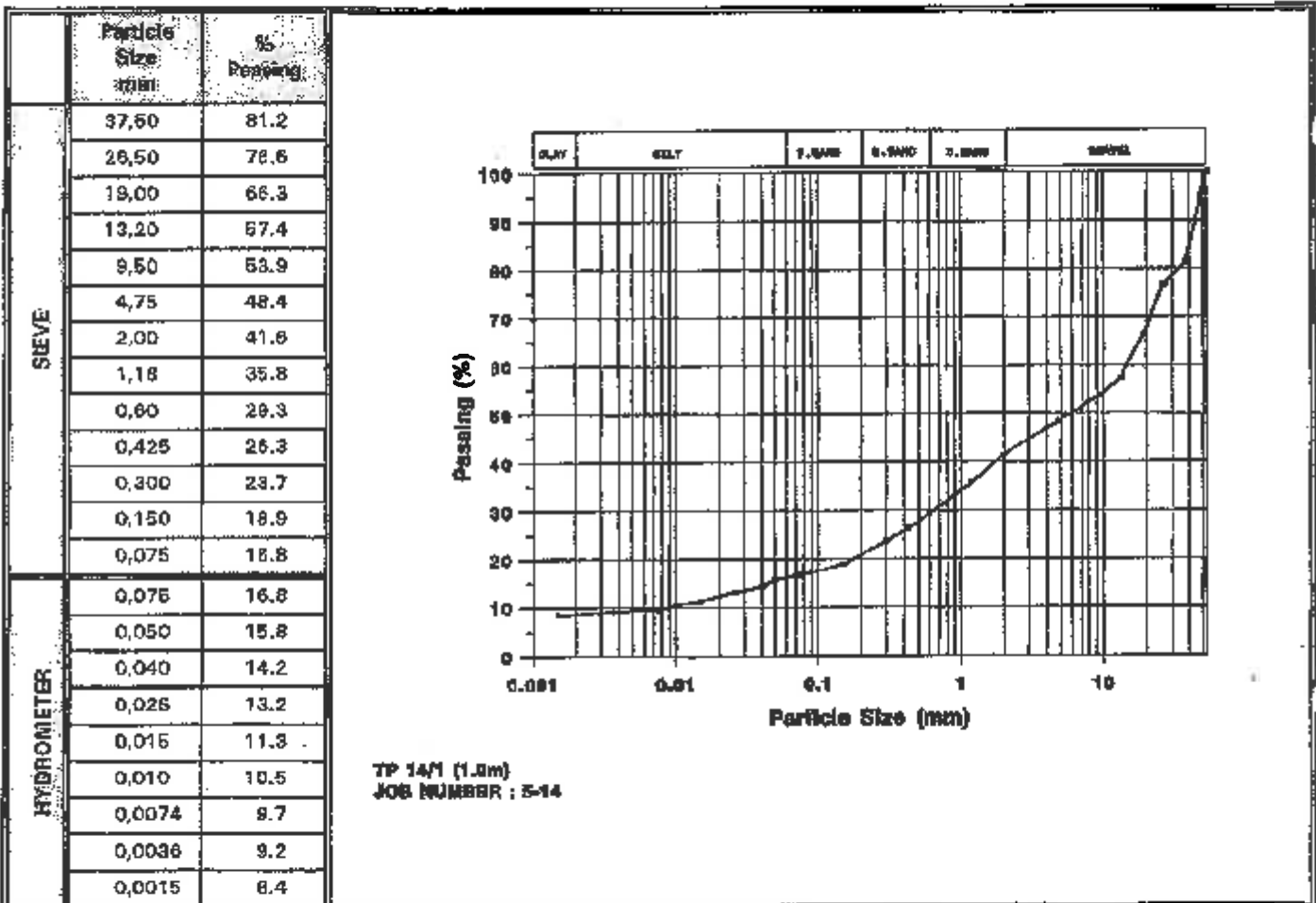
SCHOOL OF CIVIL ENGINEERING

P.O. Box 12011, Doornfontein 2028, 37 Nind Street, Doornfontein. Tel: (011) 406-2167 Fax: (011) 406-2172

Indicator Test Results

| Client Details | | TWR Details | |
|-----------------|--|----------------|------------|
| Name | INTRACONSULT ASSOCIATES | Job No. | 5 |
| Project | SITE1-BULFONTEIN and NOOTGEDACHT-IR977 | Date | 12-05-2010 |
| Reference | DR G A HALL | Technician | B KAU |
| Order No. | | Checked by | F THAIMO |
| Sample Details | | | |
| Sample Location | TP 14/1 | Depth (m) | 1.0 |
| | | Lab Sample No. | 5-14 |

GRADING ANALYSIS



ATTERBERG LIMITS

| Liquid Limit LL | Plastic Limit PL | Plasticity Index PI | Linear Shrinkage LS |
|--------------------|---------------------|------------------------|------------------------|
| 28 | 17 | 11 | 5.3 |

TWR

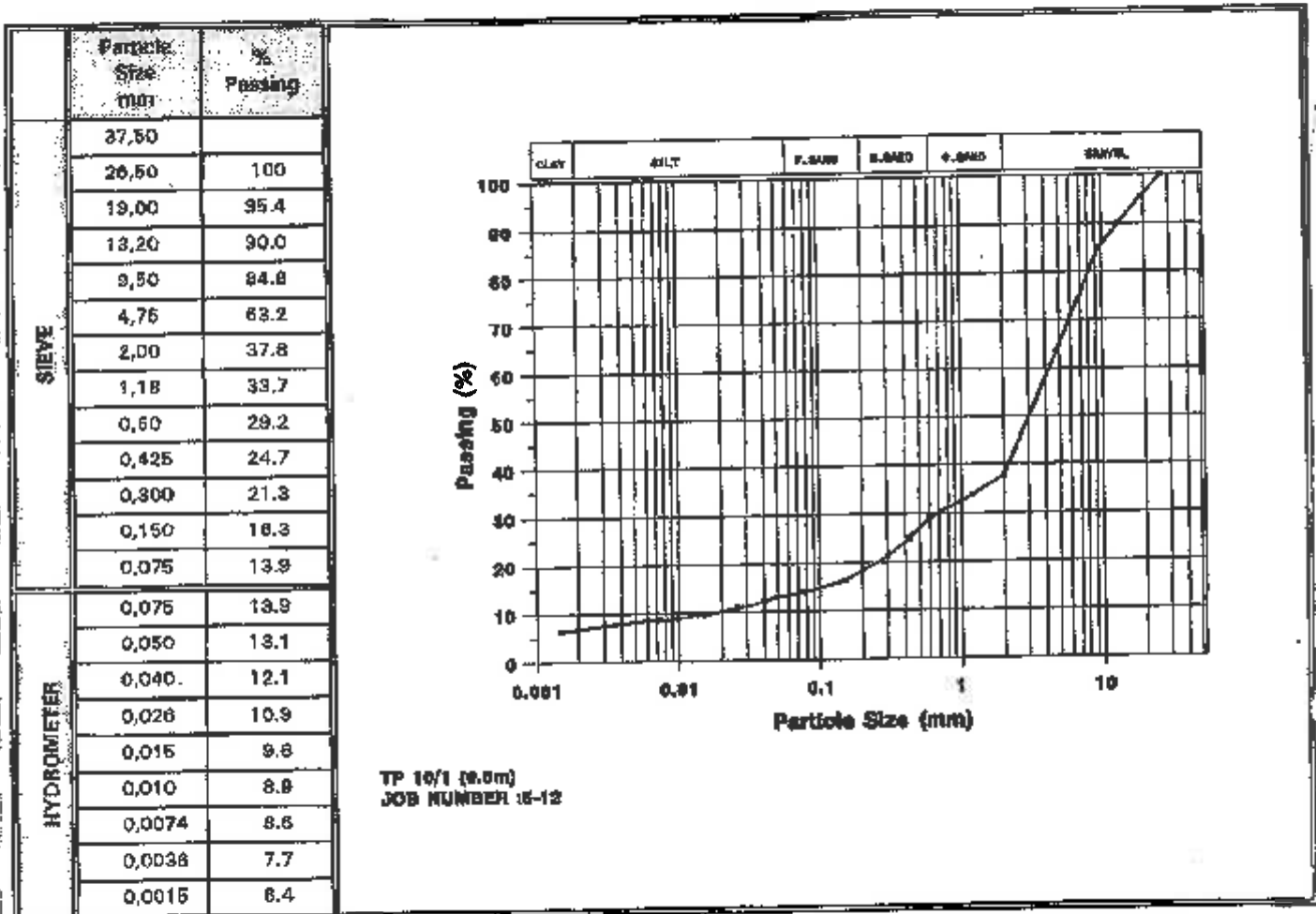
SCHOOL OF CIVIL ENGINEERING

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Indicator Test Results

| Client Details | | TWR Details | |
|-----------------|---|----------------|------------|
| Name | INTRACONSULT ASSOCIATES | Job No. | 5 |
| Project | SITE1-BULTPONTEIN and NOOTGEDACHT-IR977 | Date | 12-05-2010 |
| Reference | DR G A HALL | Technician | B KAU |
| Order No. | | Checked by | F THAIMO |
| Sample Details | | | |
| Sample Location | TP 10/1 | Depth (m) | 0.5 |
| | | Lab Sample No. | 5-12 |

GRADING ANALYSIS



ATTERBERG LIMITS

| Liquid Limit LL | Plastic Limit PL | Plasticity Index PI | Linear Shrinkage LS |
|--------------------|---------------------|------------------------|------------------------|
| 21 | 11 | 10 | 4.0 |

TWR

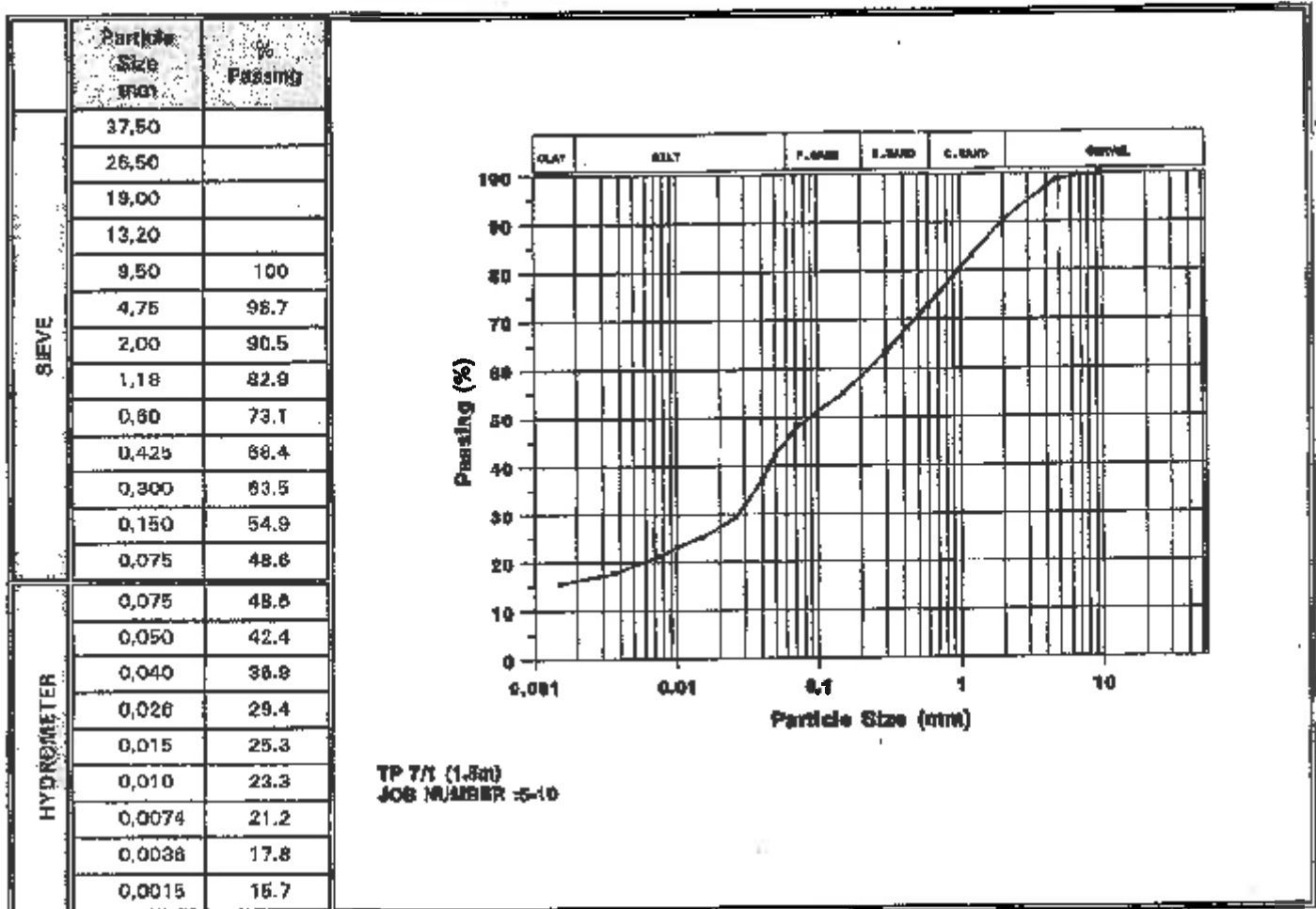
SCHOOL OF CIVIL ENGINEERING

P.O. Box 17011, Doornfontein, 2028 37 Nind Street Doornfontein Tel. (011) 406-2167 Fax. (011) 406-2172

Indicator Test Results

| Client Details | | TWR Details | |
|-----------------|--|----------------|------------|
| Name | INTRACONSULT ASSOCIATES | Job No. | 5 |
| Project | SITE1-BULTFONTEIN and NOOITGEDACHT-IR977 | Date | 12-05-2010 |
| Reference | DR G A HALL | Technician | B KAU |
| Order No. | | Checked by | F THAIMO |
| Sample Details | | | |
| Sample Location | 7/1 | Depth (m) | 1.5 |
| | | Lab Sample No. | 5-10 |

GRADING ANALYSIS



ATTERBERG LIMITS

| Liquid Limit LL | Plastic Limit PL | Plasticity Index PI | Linear Shrinkage LS |
|--------------------|---------------------|------------------------|------------------------|
| 30 | 17 | 13 | 6.0 |

TWR

SCHOOL OF CIVIL ENGINEERING

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