

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT REPORT FOR THE PROPOSED LANSERIA X53 MIXED USE DEVELOPMENT

**Portion 73 and the Remaining Extent of Portion 27
of the Farm Nietgedacht 535 - JQ**



REFERENCE: Gaut: 002/11-12/E0123

September 2015

**Bokamoso Landscape Architects and Environmental Consultants
CC**

Tel: (012) 346 3810

Fax: 086 570 5659

E-mail: lizelleg@mweb.co.za

Website: www.bokamoso.biz

PO BOX 11375

MAROELANA

0161



TABLE OF CONTENTS

1. INTRODUCTION, BACKGROUND AND THE WAY FORWARD	5
1.1 Introduction.....	5
1.2 Background	12
2. ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)	13
3. SCOPE OF WORK AND APPROACH TO THE STUDY	14
4. DESCRIPTION OF THE PROPOSED ACTIVITY	16
4.1. Name of Activity	16
4.2. Particulars of Applicant.....	16
4.3 Background of Project	17
4.4 Particulars of Activity	17
4.4.1 Nature of Activity.....	17
4.4.2 Location of Activity	18
4.4.4 The role and importance of Lanseria X53	18
4.4.5 The Need and desirability for Lanseria X53	19
5. ALTERNATIVES IDENTIFIED	20
5.1 The "No-Go" Alternative	20
5.2 Land use alternatives.....	22
5.2.1 The "Residential Only" Alternative.....	22
5.2.2 The "Mixed Use" Development Alternative	22
5.2.3 Agricultural	24
5.2.4 Conservation.....	24
5.3 Locality Alternatives.....	24
5.4 Layout Alternatives	25
6. THE DESCRIPTION OF THE BIOPHYSICAL ENVIRONMENT.....	28
6.1 THE PHYSICAL ENVIRONMENT	28
6.1.1 Geology and Soils	28
6.1.2 Hydrology	32
6.1.3 Wetlands.....	35
6.1.4 Topography.....	36
6.1.5 Climate.....	37
6.2 THE BIOLOGICAL ENVIRONMENT.....	38
6.2.1 Fauna and Flora	38
7. DESCRIPTION OF THE EXISTING SOCIAL ENVIRONMENT	40
7.1 Archaeology/Cultural History	40
7.2 Agricultural Potential	42
7.4 Institutional Environment	44
7.4.1 International Level.....	44
7.4.2 National Level	44
7.4.3 On a Local level	49
7.5 Visual Environment.....	55
7.6 Sense of Place	58
7.7 Demography.....	59
7.8 SERVICES	59

7.8.1	Water	59
7.8.2	Sewer	61
7.8.3	Storm water	62
7.8.4	Electricity	63
7.8.5	Solid waste	64
7.8.6	Traffic	65
8.	PUBLIC PARTICIPATION	66
8.1	Purpose of Public Participation	66
8.2	Identification of Interested and Affected Parties	67
8.3	Notifications to I&AP	69
8.4	Comments from I&AP's	69
9.	COMPARATIVE ASSESSMENT BETWEEN ALTERNATIVE 1, 2 AND ALTERNATIVE 3 70	
9.1	Anticipated impacts, including cumulative impacts	70
9.2	Competitive assessment between proposal and alternatives	76
10.	SIGNIFICANCE ASSESSMENT	76
10.1	Description of Significance Assessment Methodology	76
10.2	Significance Assessment of Anticipated Impacts of the Preferred Alternative	80
11.	CONCLUSION	83
12.	RECOMMENDATIONS	83

LIST OF FIGURES

Figure 1: Locality map	4
Figure 2: Aerial map	4
Figure 3: Layout Plan	23
Figure 4: Dolomite map	26
Figure 5: Hydrology map	28
Figure 6: Irreplaceable sites map	35
Figure 7: Agricultural potential map	39
Figure 8: Agricultural hub map	39
Figure 9: Urban Edge	46
Figure 10: Lanseria Development Framework	47
Figure 11: Visual assessment map	53

LIST OF TABLES

Table 1 : Listed activities in terms of Notice No. R544	6
Table 2 : Listed activities in terms of Notice No.R545	7
Table 3 : Listed activities in terms of Notice No. R 546	8
Table 4: Preliminary Environmental Issues, Alternative 1:"No Go" option.	17
Table 5: Preliminary Environmental Issues, Alternative 3: "Mixed Uses"	20
Table 6: Proposed Land Uses based on the Preliminary Layout	24
Table 7: Issues and Impacts – Geology and Soils	26
Table 8: Issues and Impacts – Hydrology	30
Table 9: Issues and Impacts – Wetlands	32
Table 10: Issues and Impacts – Climate	34
Table 11: Issues and Impacts – Fauna & Flora	37
Table 12: Issues and Impacts – Cultural history	39
Table 13: Issues and Impacts – Agriculture	40
Table 14: Visual Impact Criteria	53
Table 15: Issues and Impacts – Visual	54
Table 16: Issues and Impacts – Sense of place	56
Table 17: Issues and Impacts – Water reticulation	59
Table 18: Issues and Impacts – Sewerage reticulation	59
Table 19: Issues and Impacts – Storm water	60
Table 20: Issues and Impacts – Electricity supply	61
Table 21: Issues and Impacts – Solid waste	62
Table 22: Issues and Impacts – Traffic	63
Table 23: I&AP identified	65
Table 24: Comments from I&AP	67
Table 25: Comparative Assessment of impacts and issues <u>before</u> Mitigation	69
Table 26: Comparative Assessment of impacts <u>after</u> Mitigation	71
Table 27: Result of significance assessment of impacts identified to be associated with the proposed mix use development (after mitigation)	79

LIST OF ANNEXURES

Annexure A:	Enlargements of Figures in the Report
Annexure B:	Application Form & Acknowledgement Letter from GDARD
Annexure C:	Company Profile and CV of Lizelle Gregory (Environmental Assessment Practitioner)
Annexure D:	Specialist Reports
Annexure D1i:	Fauna & Flora Assessment
Annexure D1ii:	Avifauna Assessment
Annexure D1iii:	Mammal Assessment
Annexure D2:	Phase 1 Geotechnical Report
Annexure D3:	Services Report
Annexure D4i:	Township Establishment Memorandum
Annexure D4ii:	Township Layout
Annexure E:	Public Participation Information
Annexure E1:	Proof of Site Notice
Annexure E2:	Written Notices
Annexure E3:	Newspaper Advertisements
Annexure E4:	Communication to and from I&AP's
Annexure E5:	Minutes of meetings
Annexure E6:	Comments and Response Report
Annexure E7:	Copy of I&APs Register
Annexure F:	Environmental Management Plan

1. INTRODUCTION, BACKGROUND AND THE WAY FORWARD

1.1 Introduction

The application is made for authorization of **Establishing a mixed land use development and associated infrastructure to be known as Lanseria Extension 53 on Portion 73 and the Remaining Extent of Portion 27 of the Farm Nietgedacht 535 JQ** by the developer Extension 24 Commercial Leasing Co (Pty) Ltd. The size of the property is approximately 30 ha.

The Proposed Lanseria Extension 53 will comprise of 4 erven with the following land use zones: one Erf zoned: "Public Open Space", and three erven zoned: "Special", to accommodate 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.

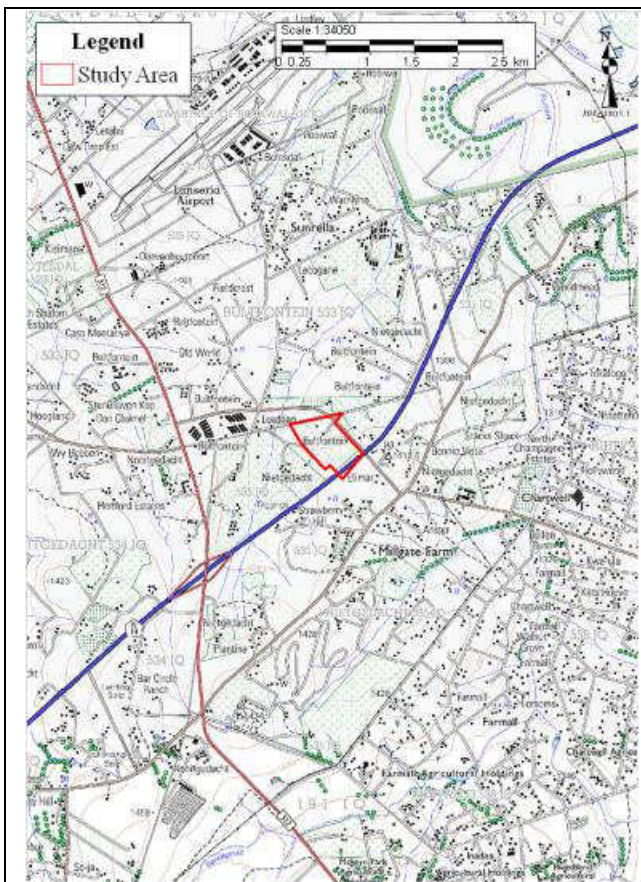


Figure 1: Locality Map

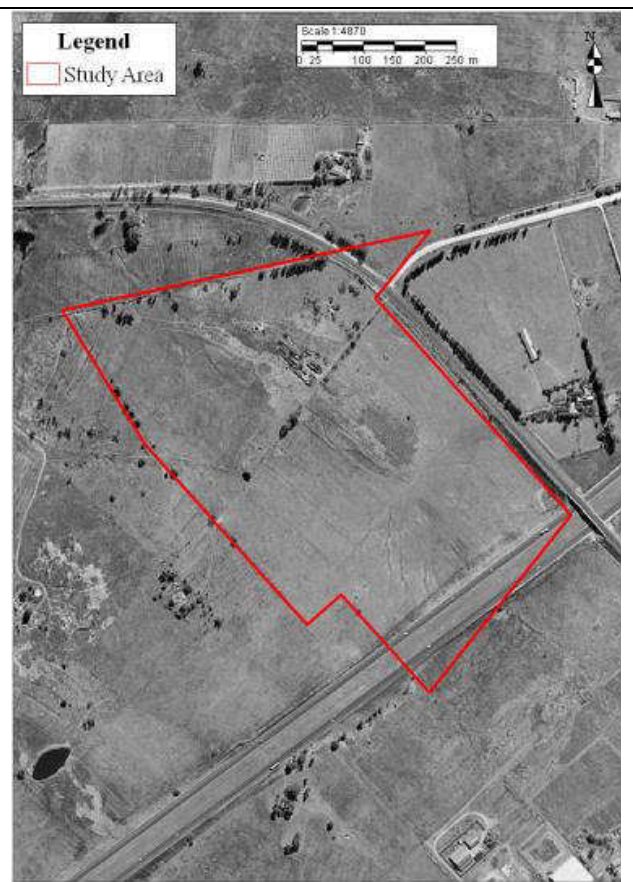


Figure 2: Aerial Map

Note: Figures are available in a larger format under Annexure A.

The application is made in terms of Government Notices no. R544, R545 and R546 published in the Government Gazette no. 33306 of 02 August 2010 of the National Environment Management Act, 1998 (Act No. 107 of 1998) and the intention of the application is to establish a mixed land use development and associated infrastructure to be known as Lanseria x 53 consisting of the following land uses, one Erf zoned: "Public Open Space", and three erven zoned: "Special".

According to the above mentioned Regulations and Notices, an Environmental Impact Assessment Process is required for the above-mentioned project, due to the following listed activity/ activities:

Table 4 : Listed activities in terms of Notice No. R544

<p>Activity 9 of Listing No. 1 R. 544, 18 June 2010</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"> (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. <p>Reason for inclusion: There are currently no services at the proposed development site, thus bulk water and sewage infrastructure will have to be constructed which triggers this listed activity.</p>
<p>Activity 11 of Listing No. 1 R. 544, 18 June 2010</p>	<p>The construction of:</p> <ul style="list-style-type: none"> (i) canals; (ii) channels; (iii) bridges; (iv) dams; (v) weirs; (vi) bulk storm water outlet structures; (vii) marinas (viii) jetties exceeding 50 square metres in size; (ix) slipways exceeding 50 squares metres in size; (x) buildings exceeding 50 square metres in size; or more <p>where such construction occurs within 32 metres of a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line.</p> <p>Reason for inclusion:</p>

	A manmade storm water channel has resulted in the establishment of an artificial wetland on the proposed development site. Construction of bridges and bulk storm water outlets will occur within 32m of a watercourse.
Activity 18 of Listing No. 1 R. 544, 18 June 2010	<p>The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 5 cubic meters from:</p> <ul style="list-style-type: none"> (i) a watercourse; (ii) the sea; (iii) the seashore; (iv) the littoral active zone, an estuary or a distance of 100 metres inland of the high-water mark of the sea or an estuary, whichever distance is the greater- <p>but excluding where such infilling, depositing, dredging, excavation, removal or moving</p> <ul style="list-style-type: none"> a) Is for maintenance purpose undertaken in accordance with a management plan agreed to by the relevant environmental authority; or b) Occurs behind the development setback line. <p>Reason for inclusion: A manmade storm water channel has resulted in the establishment of an artificial wetland on the proposed development site. Infilling and or depositing of material will thus occur within a watercourse.</p>

Table 5 : Listed activities in terms of Notice No.R545

Activity 15 of Listing No. 2 R. 545, 18 June 2010	<p>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;</p> <p>Except where such physical alteration takes place for:</p> <ul style="list-style-type: none"> (i) Linear development activities; or (ii) Agriculture or afforestation where activity 16 in this Schedule will apply. <p>Reason for inclusion The area of vacant land to be transformed is 30 ha, thus triggering this listed activity.</p>
Activity 18 of Listing No. 2 R. 545, 18 June 2010	<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 3 July 2006 and which have not been authorized 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> <ul style="list-style-type: none"> (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); (ii) It is a road administrated by a provincial authority; (iii) The road reserve is wider than 30 metres; or (iv) The road will cater for more than one lane of traffic in both directions. <p>Reason for inclusion The R552 transects the north-eastern boundary of the proposed development site.</p>

Table 6 : Listed activities in terms of Notice No. R 546

<p>Activity 4 of Listing No. 3 R. 546, 18 June 2010</p>	<p>The construction of a road wider than 4 metres with a reserve less than 13, 5 metres.</p> <p>(b) In Gauteng:</p> <ul style="list-style-type: none"> i. Protected area identified in terms of NEMPAA, excluding conservancies; ii. National Protected Area Expansion Strategy Focus areas; 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; iv. Sites or areas identified in terms of an international Convention; v. Sites identified as irreplaceable or important sites in the Gauteng Conservation Plan; vi. Areas larger than 2 hectares zoned for use as public open space; vii. Areas zoned for conservation purpose; viii. Any declared protected area including Municipal or Provincial Nature Reserve as contemplated by the Environmental Conservation Act, 1989 (Act No. 73 of 1989) and the Nature Conservation Ordinance (Ordinance 12 of 1983); ix. Any site identified as land with high agricultural Hubs or Important Agricultural Sites identified in terms of the Gauteng Agricultural Potential Atlas, 2006. <p>Reason for inclusion</p> <p>Roads to be constructed within the development will exceed 4m in width and a site identified as Important and as Ecological support area in terms of the Gauteng Conservation Plan occurs on site, therefore this listed activity is triggered by the proposed development.</p>
<p>Activity 6 of Listing No. 3 R. 546, 18 June 2010</p>	<p>The construction of resorts, lodges or other tourism accommodation facilities that sleeps 15 people or more.</p> <p>(b) In Gauteng:</p> <ul style="list-style-type: none"> i. A protected area identified in terms of NEMPAA, excluding conservancies; ii. National Protected Area Expansion Strategy Focus areas; iii. Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act as adopted by the competent authority; iv. Sites or areas identified in terms of an International Convention v. Sites identified as irreplaceable or important in the Gauteng Conservation Plan; vi. Within 100 metres of from the edge of a watercourse; 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>Reason for inclusion</p> <p>Included in the mix use development is Hotels, thus this listed activity is triggered due to the proposed development occurring within an area classified as Important and as Ecological support area in terms of the Gauteng Conservation Plan.</p>
<p>Activity 13 of Listing No. 3 R. 546, 18 June 2010</p>	<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> <ul style="list-style-type: none"> (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. 59 of 2008) in which case the activity is regarded to be excluded from this list. (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>(d) In Gauteng:</p> <ul style="list-style-type: none"> i. A protected area identified in terms of NEMPAA, excluding conservancies; ii. National Protected Area Expansion Strategy Focus areas; iii. 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); 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>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> <p>Reason for inclusion</p> <p>More than 1 ha of indigenous vegetation will be cleared from an area identified as an Important Area and as Ecological support Area in terms of the Gauteng Conservation Plan and therefore this listed activity s triggered.</p>
--	--

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 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

Listing No. 1 R. 983, December 2014	Activity 9	<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"> (i) With an internal diameter of 0,36 metres or more; or (ii) With a peak throughput of 120 litres per second or more, <p>excluding where:</p> <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.
Listing No. 1 R. 983, December 2014	Activity 10	<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> <p>(i) with an internal diameter of 0,36 metres or more; or</p> <p>(iii) with a peak throughput of 120 litres per second or more;</p> <p>excluding where;</p> <p>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</p> <p>b. where such development will occur within an urban area.</p>
	Activity 27	<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> <p>(i) the undertaking of a linear activity; or</p> <p>(ii) maintenance purposes undertaken in accordance with a maintenance management plan</p>

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- (i) Linear development activities; or (ii) Maintenance proposes undertaken in accordance with a maintenance management plan.
--------------------------------------	-------------	--

Since the proposed development includes listed activities from No. R544, R545 and R546, 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/E0123** had been assigned to the application.

1.2 Background

Bokamoso Landscape Architects and Environmental Consultants CC were appointed by **Extension 24 Commercial Leasing Co (Pty) Ltd** as independent consultant to prepare the applicable environmental reports and GDARD accepted the application that was submitted on 25 November 2013. The Reference Number issued by GDARD for the project is **Gaut: 002/11-12/E0123**.

The EIA application for the proposed mix use development was submitted in terms of the 2010 NEMA EIA Regulations and in terms of the amended 2014 EIA Regulations such pending applications must be dispensed with in terms of the 2010 NEMA EIA Regulations.

GDARD approved the Plan of Study for Environmental Impact Assessment (EIA) and Scoping Report for EIA on **9 February 2015**, which was submitted by Bokamoso Landscape Architects and Environmental Consultants CC and received by the Department on 27 May 2014 and granted an extension of 3 months for submission of the draft EIA on 11 June 2015. GDARD requested that the following be undertaken as part of the EIAR:

1. All activities to be described and impacts assessed;
2. Alternatives must be identified and assessed;

3. Comments from I&APs to be addressed including comments from CoJ and DWS;
4. Full PPP to be conducted with additional advertisement in English newspaper;
5. CoJ is the relevant authority and must be consulted;
6. Impacts of linear activities to be assessed;
7. Include motivation of need and desirability;
8. Agricultural potential study to be conducted;
9. Services report to be included and infrastructure capacity to be confirmed with relevant municipality;
10. Biodiversity assessment of;
 - a. vegetation to establish whether specific tree species listed are present on site,
 - b. and of birds with specific focus on Red Listed birds prioritized by GDARD;
 - c. and a Wetland assessment including wetland habitat assessment for specific mammal species as listed;
11. All studies as indicated in Plan of Study to be included;
12. Layout plan with sensitivity overlay is required;
13. Site specific EMP as part of Final EIR.

2. ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)

The Amended 2010 NEMA Regulations require that relevant details of the Environmental Assessment Practitioner be included as part of the EIAR. In this regard, attached as **Annexure C**, is a copy of the CV of the EAP for this project, Ms. Lizelle Gregory from Bokamoso Landscape Architects and Environmental Consultants. In summary details of the EAP are indicated below:

- o **Name:** Lizelle Gregory
- o **Company:** Bokamoso Landscape Architects and Environmental Consultants.
- o **Qualifications:** Registered Landscape Architect and Environmental Consultant (degree obtained at the University of Pretoria) with more than 18 years' experience in the following fields:

- Environmental Planning and Management;
- Compilation of Environmental Impact Assessment;
- Landscape Architecture; and
- Landscape Contracting

Ms. L. Gregory also lectured at the Technicon of South Africa and the University of Pretoria. She 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 of Environmental Management and Assessment (IEMA).

3. SCOPE OF WORK AND APPROACH TO THE STUDY

An application form for environmental authorisation of the relevant activity as well as an Environmental Scoping Report has been submitted to Gauteng Department of Agriculture, Conservation and Environment (GDARD). 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 Draft 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 Approved 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 Bokamoso is 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 government 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 the Environmental Management Plan (EMP) (**refer to Annexure F**). 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)).

4. DESCRIPTION OF THE PROPOSED ACTIVITY

4.1. Name of Activity

Establishment of a mixed land use development and associated infrastructure to be known as Lanseria x 53 on Portion 73 and the Remaining Extent of Portion 27 of the Farm Nietgedacht 535 JQ.

4.2. Particulars of Applicant

Applicant: Extension 24 Commercial Leasing Co (Pty) Ltd

Contact Person: Mr. Chris Harris

Physical Address: 1ST Floor NW Block, 5 Wessels Rd, Rivonia, 2128
Benmore
2010

Postal Address: PO Box 651099
Benmore
2010

Tel: (011) 803 9233

Cell: +27 83 803 9233

Fax: (011) 803 9550

Email: chris@syndev.co.za

4.3 Background of Project

The application for environmental authorization for the proposed mixed use development situated on Portion 73 and the Remaining Extent of Portion 27 of the Farm Nietgedacht 535 JQ was submitted to GDARD on **22 August 2011** and the Final Scoping report was received by GDARD on **27 May 2014**.

A Memorandum in support of an application for establishment of a township in terms of Section 96 (1) of the Town Planning Ordinance, 1986 (Ordinance 15 of 1986) was compiled by Tinie Bezuidenhout & Associates Town Planning Consultants in November 2010 and a layout plan was compiled during May 2012.

Bigen Africa Services (Pty) Ltd compiled a bulk water, sewerage and electricity report in May 2011. Intraconsult CC conducted a Phase 1 Geotechnical study for the mixed use development during May 2010. Galago Environmental conducted a Biodiversity assessment in terms of fauna, flora, birds and mammals.

A wetland assessment is currently being carried out by Terra Soil Science and the report as well as recommendations will be incorporated into the Final EIA Report.

4.4 Particulars of Activity

4.4.1 Nature of Activity

The establishment of a **mixed use development (township)** consisting of the following land uses:

One Erf zoned: "Public Open Space", and three erven zoned: "Special", to accommodate 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.

4.4.2 Location of Activity

Refer to Figure 1 for Locality Map and Figure 2, Aerial Map

The proposed development will take place on the Portion 73 and the Remaining Extent of Portion 27 of the Farm Nietgedacht 535 JQ. The study area is situated on the north-west corner of the crossing between the N14 Freeway and the R552 and except for a derelict building, the site is vacant.

To the north of the site is vacant land and rural residential dwellings, east of the site is vacant land, rural residential dwellings and informal settlements, a crocodile farm, rural residential dwellings, vacant land and agricultural land is situated to the south, with more vacant land to the west. The R552 traverses the development sites north eastern corner. The N14 Freeway runs parallel to the south eastern boundary of the development site.

4.4.4 The role and importance of Lanseria X53

Lanseria Airport carries status as international airport and is the only international airport within the jurisdiction of the city of Johannesburg Metropolitan Municipality. Due to the increase in passenger number at Oliver Thambo International Airport a demand ensued for an airport close to the northern suburbs of Johannesburg. Air related facilities around Oliver Thambo were utilized to capacity which increased the demand for business orientated land uses surrounding Lanseria. Therefore there is an increasing demand for industrial, commercial and mixed land use space for the purpose of air related facilities near Lanseria International Airport.

Unlike Oliver Tambo International Airport, land adjacent to Lanseria International Airport is mostly vacant and therefore it is possible to plan the development of the surrounding area.

The proposed development site is highly accessible via the R512 and R552 as well as N14 and N1 freeways. Due to excellent accessibility the Kya Sand and Lanseria Development Frameworks identified the site as falling within the proposed Lanseria Node. Water and sewage infrastructure is not freely available in the area. The development of the site will address the need for service infrastructure as well as creating employment and social opportunities associated with the Lanseria Airport. The development site is located in zone 4B – the Metropolitan Mixed Use Nodal Periphery Area comprising mainly of high density residential dwellings, hotels, educational, medical, and social facilities, retail, office, entertainment and motor trade businesses, municipal and government institutions, and commercial industrial, which is in line with the proposed development and therefore the proposed development will contribute to planned Municipal land use.

4.4.5 The Need and desirability for Lanseria X53

The proposed mixed use development (township) will consist 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.

The proposed development is well suited for the mixed use development due to excellent accessibility, visibility, and location within the precinct. As a result of the Lanseria node there is a need for high density residential units in the area. Lanseria Airport is not equipped with a Hotel, and in the inclusion of a Hotel as part of the mixed use development will cater for this need. There is no shopping centre within the vicinity of the application site, and the establishment of both industrial and residential developments in the area has created the need for a shopping mall. Shopping malls have significant community impacts and create continuing employment opportunities. Considering the close proximity to Alexandria there is a need for employment opportunities in the area.

Due to the proposed development site being located within the Lanseria Node there is a need and desire for office space.

The exposure of the site in terms of accessibility and visibility makes the site desirable as a motor showroom. A Medical facility could cater for the needs of residents as well as those employed in the vicinity. Residential development creates the need for educational facilities whereas educational facilities facilitate residential use of the development site. The exposure and accessibility of the development site makes it ideal for commercial and industrial uses.

The proposed development complies with principles of the Johannesburg Regional Spatial Development Framework as well as the Lanseria Development Framework 2020 and is therefore necessary and desirable.

5. ALTERNATIVES IDENTIFIED

Alternatives considered as a part of the EIA Process included the No-Go Option, locality alternatives, land use alternatives and layout alternatives.

5.1 The "No-Go" Alternative

The "No-Go" Option means that the study area is left in its present condition. The site is currently vacant with only a derelict farm building on it.

According to the GDARD C-Plan 3, 2011, an important area and ecological support area occurs within the development footprint and is regarded as ecologically sensitive due to the potential presence of Orange listed plants. **Refer to Figure 8, Irreplaceable Sites map.**

Table 4: Preliminary Environmental Issues, Alternative 1:"No Go" option.

Issue	Short term	Medium term	Long term	Impact
Geology and soils				Positive Neutral Negative

The "no-go" option means that the site will remain vacant and the impact will be neutral during the short to long term as no activities are currently taking place on the site or in the future.				
Hydrology				Positive Neutral Negative
The hydrology on the site will be neutral in the short term and will then turn negative in the medium to long term. The site is vacant and not fenced off properly and due to poverty and limited natural resources people are more prone to temporary reside on vacant areas such as these with wetlands where water is readily available for use (i.e. bathing etc). Due to these miss-use of the wetland area the water will be directly polluted as well as the runoff will be polluted. This will furthermore have a negative impact on the surface and groundwater. It is also expected that the storm water from the roads are contaminated due to oils, chemicals etc. from the ongoing and surrounding traffic. The status of the wetland is seen to further degrade due to the contaminated storm water runoff.				
Vegetation				Positive Neutral Negative
The vegetation on the site is expected to remain neutral from the short to the long term. However in the event that people will reside illegally on the site which is a possibility (as previously explained) it could then turn negative in the long term.				
It furthermore is seen that should all the areas in the surrounding area remain in its current state, (which is highly unlikely as developers sought after available land in the Lanseria area due to future growth as part of the Lanseria Development Framework 2020 and the RSDF for the area) it is expected that the area will be degraded and will make space for alien invasive plant species. The site will not be protected by anyone and it could lead to furthermore degradation of the wetland.				
Fauna				Positive Neutral Negative
The fauna is also expected to remain neutral from the short to the long term except in the case where illegal settlement takes place over the long term. Should this be the case it is expected that the long term will turn negative as humans will definitely have a negative impact on the fauna.				
Social				Positive Neutral Negative
The social impact is neutral throughout the short to long term. However should the site be inhabited by illegal vagrants it will then turn negative in the long term. It will have a negative impact on the surrounding environment due to the safety and security risks involved.				
Economic				Positive Neutral Negative
Economically the "no- go" option on the site is seen as negative due to no development taking place on the site. In terms of the Lanseria Development Framework 2020 and the RSDF this area is earmarked for future growth and development. Developers sought after land in the Lanseria area due to its accessibility, proximity to work opportunities and locational desirability. The Lanseria Airport is also situated near to the site.				
Agriculture				Positive Neutral Negative
The Agricultural factor will remain neutral as this land is earmarked for agricultural uses. However it will not be feasible to grow crops on this land due to the size of the site and there is not really any connectivity to other farms in close proximity. According to our knowledge the surrounding farm properties is also in the process of obtaining environmental and town planning rights for future developments. Therefore in the light of the afore mentioned it can be said that the economic factor carries more weight at this stage than the "no-go" or agricultural factor.				
Infrastructure				Positive Neutral Negative
The infrastructure factor is seen as from the short to long term as no development will means no infrastructure. As				

explained this area is earmarked for future growth and development and in order for that to happen the infrastructure should also be installed or upgraded to accommodate the new developments. In the light of the latter the "no-go" option will have a negative impact on infrastructure.

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

5.2 Land use alternatives

5.2.1 The "Residential Only" Alternative

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 exists for efficient services and job opportunities closer to the living area, and therefore residential only is not regarded as the best option for the piece of undeveloped land.

5.2.2 The "Mixed Use" Development Alternative

In terms of this alternative, it is proposed to establish a township on the site and to include other land uses to provide in the full spectrum of land uses that can benefit from the regional location of the site. It is proposed to have four erven in the Township. The Township will include Residential dwelling units, Hotels, Educational, Medical and Social Facilities, Retail, Offices, Entertainment, Motor trade, Municipal and Government Institutions and Commercial Industrial land uses.

Due to the socio-economic considerations a mixed use development was regarded as the preferred alternative for the study area. The site is extremely well suited for mixed use developments due to its excellent regional accessibility via the R512 and R552 to both the N14 and N1 freeway. In addition, a mixed use development will also supply employment

opportunities in close proximity to residential areas and will contribute to the efficient economic functioning of the area.

Table 5: Preliminary Environmental Issues, Alternative 3: "Mixed Uses"

Issue	Short term	Medium term	Long term	Impact
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 form 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. The impact will then turn neutral in the long term.</p>				
Hydrology				Positive Neutral Negative
<p>The hydrology on the site will be negative in the short term due to construction activities taking place on the site. It is expected that during this phase the surface hydrology will alter the flow of water through the landscape. Due to the working staff, there will be an increasing demand for drinking water as well as for dust suppression. It is also expected that the water quality could be impacted on by contributing sediment, nutrients and other pollutants to limit water supplies, and increase the rate and volume of water.</p> <p>Then the impact on the medium to long term will change from neutral to positive as the engineering services will all be in place which will mitigate impacts in terms of groundwater, surface water and storm water.</p>				
Vegetation				Positive Neutral Negative
<p>The vegetation on the site is negative in the short term due to the construction activities on site. During this phase most of the vegetation is removed and cleared. After the construction phase it is seen that the impact will turn neutral due to landscaping. The landscaping will be maintained on the site during the operational phase.</p>				
Fauna				Positive Neutral Negative
<p>The fauna will be negative in the short term due the construction activities taking place on the site. It will then turn neutral in the medium to long term once the construction phase is completed.</p>				
Social				Positive Neutral Negative
<p>The social impact is negative in the short term due to construction activities on the site. It will then turn neutral in the medium term and positive in the long term. The development will create numerous job opportunities on a temporary as well as permanent basis. Once the construction phase is completed the area will be secured and safe.</p>				
Economic				Positive Neutral Negative
<p>The proposed mixed use development will have a positive impact from the short To the long term. The area is earmarked for future development as previously explained and supported by the relevant policies. The Lanseria Airport is in close proximity to the development and developers sought after land in this area for development.</p>				
Agriculture				Positive Neutral Negative
<p>This sector will remain negative As the land is earmarked as Agriculture. However when weighing up the agricultural</p>				

factor against the other important factors i.e. social; economic; infrastructure etc. it outweighs the negative factor of development on agricultural land. This portion of land is ideally situated for development.

Infrastructure				Positive Neutral Negative

Development in any area brings forth services and infrastructure. Therefore in the short term the impact is to be negative as the services need to be installed but this is only for a short duration. Thereafter the negative impact turns neutral in the medium term and positive in the long term. After the construction period the area will be fully serviced and most likely at the cost of the developer. Therefore it immediately creates a positive impact for the community and its surroundings.

Note: The proposed development option is predominantly negative in the short term, turns neutral in the medium term and then positive in the long term.

5.2.3 Agricultural

Despite the study area not forming part of the seven agricultural hubs identified for Gauteng, and the soil having low agricultural potential, GDARD requested in their approval of the Scoping Report that an Agricultural Potential Study be conducted.

An Agricultural potential study is underway and the findings as well as the report will be incorporated into the Final EIA Report.

5.2.4 Conservation

The Fauna and Flora assessment concluded that the floral composition of the terrestrial habitat can no longer be regarded as typical of Egoli Granite Grassland and is therefore not a sensitive unit. The grassland is secondary grassland with limited connectivity. The study area has been affected by past and present human activities and natural areas are small and fragmented. The surrounding area is continuously being developed. Considering the low environmental sensitivity of the site and that the site has been degraded by historic activities as well as development on the surrounding land, Conservation is not considered a viable option for the proposed development site.

5.3 Locality Alternatives

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

- The site is extremely well suited for mixed use developments due to its excellent accessibility, visibility and location within this precinct.
- 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 site is extremely well placed within this region. It is located in the north-west corner of the crossing between the N14 Freeway and the R552 Provincial Road, between Lanseria Airport and the N14 Freeway.
- The study area is located in a very prominent location within the Lanseria Airport.
- The prominence of the property and the exposure thereof to the R512 and R552 Provincial Roads.
- The study area is close to 3 schools, a little farm school, a private college (Heron Bridge College) and a government primary school (Laerskool Nooitgedacht).
- The site is earmarked for future nodal uses in terms of the RSDF and Lanseria Development Framework 2020.

Considering the ideal location of the proposed development site as well as availability of land, no other locality alternatives were considered for the proposed development.

5.4 *Layout Alternatives*

Layout alternatives for the development will be considered during the Final EIA phase of the development before the final layout is compiled.

The physical features of the study area and the alignment of the Existing N14 & R552 are considered as the main structuring elements of the layout. The final layout will be tested against an environmental sensitivity map that will be compiled for the study area.

The final layout will be a product of a multi-disciplinary workshop (during the EIA phase) between the appointed professionals. At the workshops each discipline (including the

environmental consultant) will be afforded the opportunity to share his/ her findings with the other members of the project team. The environmental consultants will present the environmental sensitivity map to the project team.

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 workshops.

A preliminary layout was compiled by specialist based on the environmental information currently available. **(Refer to Figure 3: 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	Erven	ERF No's	AREA Ha	OF TOTAL AREA
SPECIAL	3	1 TO 3	22,3891	73,89
PUBLIC OPEN SPACE	1	4	2,3958	7,91
ROAD R552			3,2787	10,83
ROAD N12			2,2013	7,28
TOTAL	4		30,2649	100.00

6. THE DESCRIPTION OF THE BIOPHYSICAL ENVIRONMENT

This section 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 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 mix use development.

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

6.1 THE PHYSICAL ENVIRONMENT

6.1.1 Geology and Soils

The study area is bisected by an artificial wetland / manmade culvert draining off the N14, running from southeast to northwest. The site forms parts of the A21C Jukskei quaternary catchment area. This drainage line, fed by the run-off from the highway, runs towards a tributary of the Jukskei River. The site comprises of vacant land covered in veld grasses, scattered trees, a derelict farmhouse and building rubble.

The site is underlain by bedrock of the Halfway House Granite Suite which consists mostly of granite and granite gneiss of the Basement Complex. The bedrock has been intruded by

basic igneous rocks in sections of this area. According to GIDS the study area **is not** underlain by dolomite.

Residual soils are only partly developed across the site and comprise of gravely silty sand and clayey silts. The overlying transported soils are predominantly fine sandy materials. Soil types uncovered include; Hillwash, Alluvium, Pebble marker, reworked residual granite, reworked residual diabase, and residual diabase.

Two aquifers are associated with the site; a shallow primary weathered aquifer, and a secondary aquifer.

Table 7: Issues and Impacts – Geology and Soils

	Issue/ Impact	Positive/ Negative/ Neutral ±	Mitigation Possible (Yes/No)
1)	Stability of structures due to collapsible and expansive soils	-	Yes
2)	Shallow Groundwater table resulting in accumulation of surface water	-	Yes

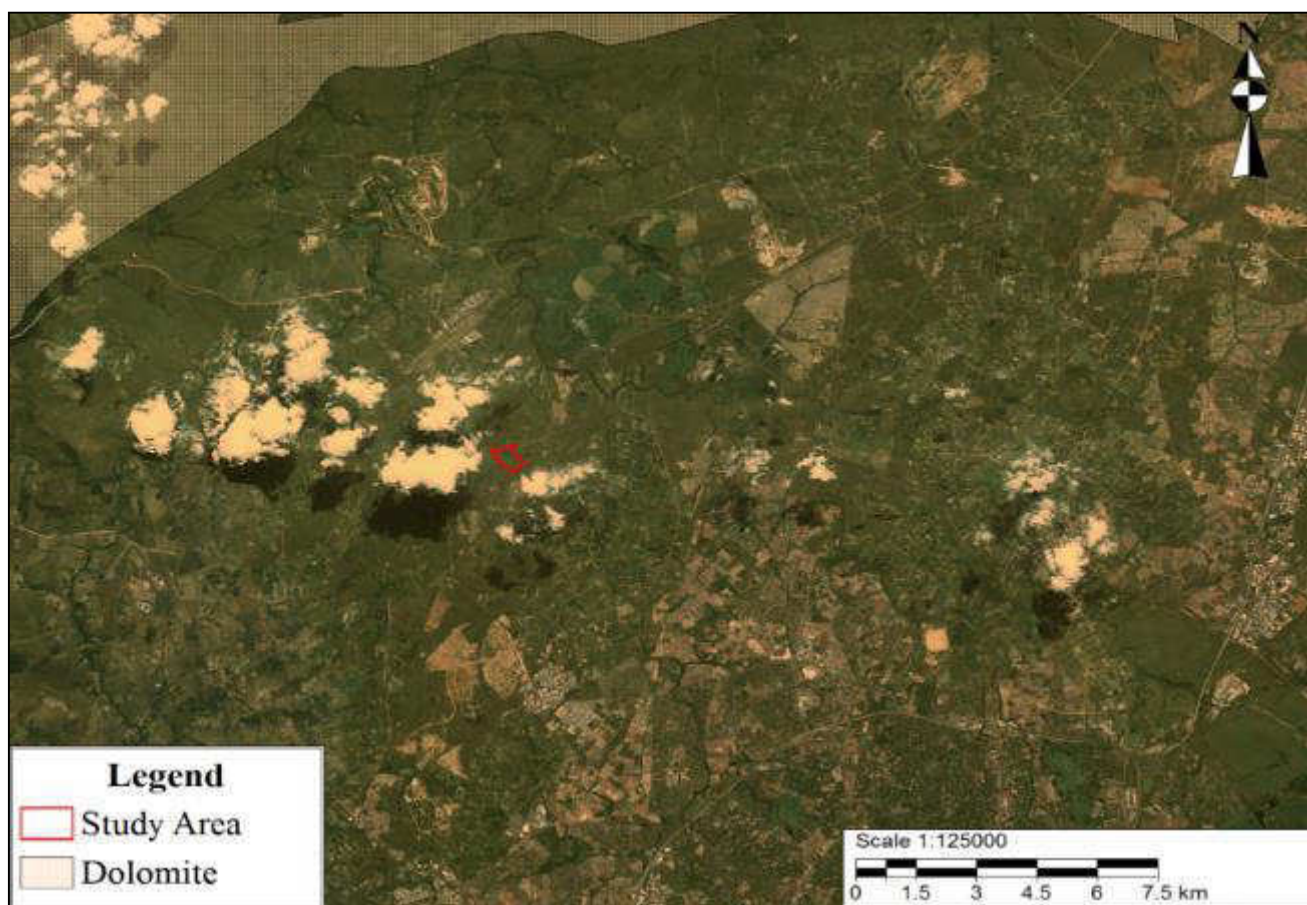


Figure 3: Dolomite Map

6.1.1.1 Discussion of issues identified, possible mitigation measures and significance of issue after mitigation – geology and soils

1) Stability of structures due to collapsible and expansive soils

Stability of structures could be a concern due to potential collapsible, and activity of soils. The potential impact can however be mitigated.

Mitigation measures to be included in the EMP

Planning Phase

- A Phase 2 geotechnical assessment is required;
- A stiffened raft solution is favored on site;

- Site specific investigation must be conducted on all erven planned for major structures prior to design finalization and construction;
- Layout plans to be certified by geotechnical specialist.

Construction Phase

- A competent specialist to inspect excavations during construction.

The **significance** of the issue **following mitigation** is **Low**.

2) Shallow Groundwater table resulting in accumulation of surface water

Shallow groundwater conditions could result in springing water conditions during and after heavy rains.

Mitigation measures to be included in the EMP

Planning Phase

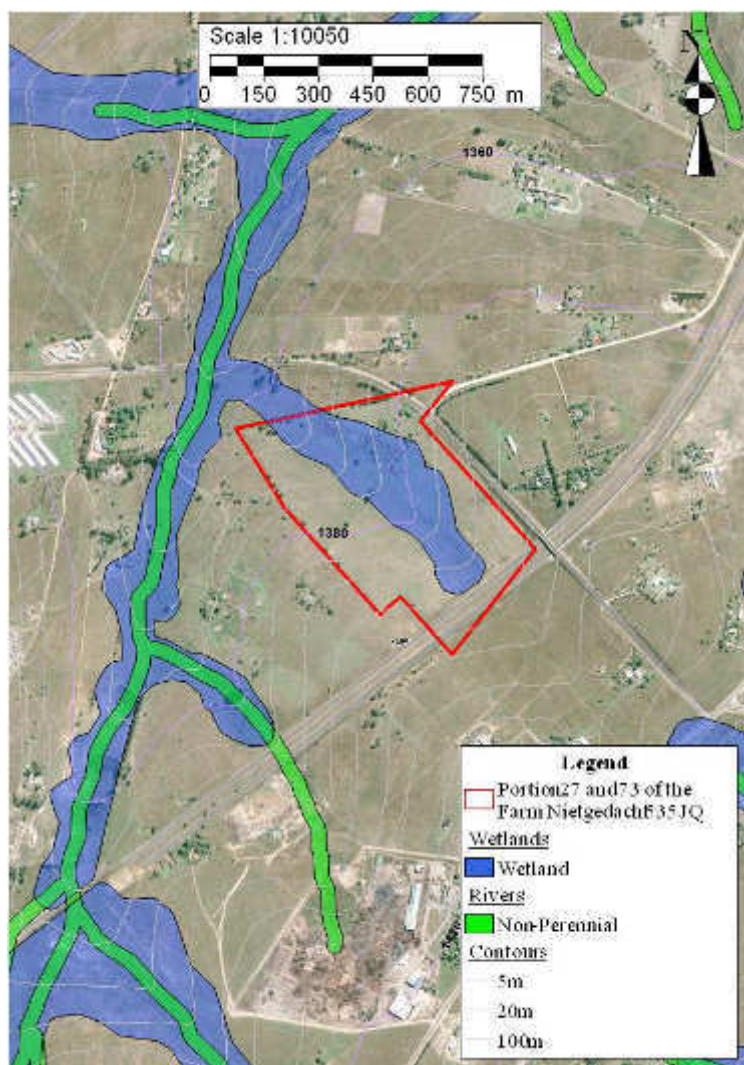
- Minimum freeboard of 150mm should be incorporated into building designs;
- Storm water structures must be designed to ensure storm water is removed in speedy and efficient manner to prevent surface water from accumulating near buildings;
- Storm water attenuation must be catered for prior to releasing water into artificial wetland; and
- Avoid planting flowerbeds near buildings.

The **significance** of the issue **following mitigation** is **Low**.

6.1.2 Hydrology

6.1.2.1 Surface Hydrology

The study area is not affected by 1:50 and 1:100 year floodlines according to the 1:50 000



topographic map. However, the biodiversity data obtained from GDARD indicates that a wetland is present on the site.

The site is bisected by an artificial north westerly draining channel which diverts storm water off the N14 and feeds another northerly flowing stream which form part of the Jukskei catchment area. There's a non-perennial river on the western and southern side of the study area. The non-perennial river on the western side of the study area gently drains to the south.

Figure 4: Hydrology Map

An engineer was consulted regarding the hydrology on site and it is probable that storm water and associated culverts have lead to the buildup of water and consequently the formation of drainage line. Therefore, this is not regarded as a natural wetland area but rather human impacts that have lead to a drainage line.

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.

6.1.2.2 Sub-Surface Hydrology

The site is a typical hard rock environment and, although actual field evidence is limited, two distinct aquifer systems are expected to operate on this site; 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, preliminary investigations indicate an abrupt transition from the top most soil horizons to the shallow bedrocks in the lower profile with groundwater perched on top of these practically impermeable materials. Both the perched and secondary aquifers are recharged by rainfall.

Any accumulation of surface waters near to buildings will have to be avoided by appropriate surface drainage design. A complete geotechnical report will be submitted with the Final EIA Report.

Table 8: Issues and Impacts – Hydrology

	Issue/ Impact	Positive/ Negative/ Neutral ±	Mitigation Possible (Yes/No)
1)	Shallow Groundwater table resulting in accumulation of surface water	-	Yes
2)	Increased storm water run-off due to impermeable surfaces	-	Yes

6.1.2.3 Discussion of issues identified, possible mitigation measures and significance of issue after mitigation – hydrology

1) **Shallow Groundwater table resulting in accumulation of surface water**

Shallow groundwater conditions could result in springing water conditions during and after heavy rains.

Mitigation measures to be included in the EMP

Planning Phase

- Minimum freeboard of 150mm should be incorporated into building designs;
- Storm water structures must be designed to ensure storm water is removed in speedy and efficient manner to prevent surface water from accumulating near buildings; and
- Avoid planting flowerbeds near buildings.

The **significance** of the issue **following mitigation** is **Low**.

2) **Increased storm water run-off due to impermeable surfaces**

Construction of impermeable surfaces associated with the development has the potential of increasing volume and speed of storm water run-off.

Mitigation measures to be included in the EMP

Planning Phase

- A detailed Storm Water Management Plan will be required for assessment and inclusion in the Final EIA Report;
- The storm water design for the proposed development must be designed to attenuate storm water, reduce and/or prevent siltation, erosion, and water pollution.

The **significance** of the issue **following mitigation** is **Low**.

6.1.3 Wetlands

The site is bisected by a well defined man-made north westerly drainage channel. This channel is associated with storm water run-off from the N14. The possible presence of a wetland is currently being investigated.

Table 9: Issues and Impacts – Wetlands

	Issue/ Impact	Positive/ Negative/ Neutral ±	Mitigation Possible (Yes/No)
1)	Possible presence of wetland and its integrity	-	Yes

6.1.3.1 Discussion of issues identified, possible mitigation measures and significance of issue after mitigation – wetlands

1) Possible presence of wetland and its integrity

The manmade diversion of storm water from the N14 freeway has resulted in an artificial wetland forming on the proposed development site.

Mitigation measures to be included in the EMP

Planning Phase

- Wetland assessment to be conducted on the drainage line and any proposed buffers to be included in the layout of the development, and the wetland assessment report to be included in the Final EIA Report;

The **significance** of the issue **following mitigation** is **Low**.

6.1.4 Topography

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

Table 9: Issues and Impacts – Topography

	Issue/ Impact	Positive/ Negative/ Neutral ±	Mitigation Possible (Yes/No)
1)	Visibility from surrounding land and roads	-	Yes

6.1.4.1 Discussion of issues identified, possible mitigation measures and significance of issue after mitigation – topography

1) Visibility from surrounding land and roads

The visibility of structures to surrounding land owners could be displeasing. Reflective surfaces of buildings to be constructed as part of the development could result in impaired visibility of drivers travelling on adjacent roads.

Mitigation measures to be included in the EMP

Planning Phase

- Building designs to be aesthetic pleasing to passersby and fit into surrounding landscape;
- Construction materials used on outer surfaces of buildings should not be reflective and negatively affect motorist's sight.

The **significance** of the issue **following mitigation** is **Low**.

6.1.5 Climate

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

Wind

Summer prevailing winds are in a north western direction and winter winds in a south eastern direction.

Temperature °C

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.

Table 10: Issues and Impacts – Climate

	Issue/ Impact	Positive/ Negative/ Neutral ±	Mitigation Possible (Yes/No)
1)	Wet conditions deterring construction and rehabilitation	-	Yes
2)	Dry and windy conditions resulting in air pollution	-	Yes

6.1.5.1 Discussion of issues identified, possible mitigation measures and significance of issue after mitigation - Climate

1) Wet conditions deterring construction and rehabilitation

Should the construction phase be scheduled for the summer months, frequent rain could cause very wet conditions, which would negatively affect construction and environmental rehabilitation.

Mitigation measures to be included in the EMP

Planning Phase

- Construction should be scheduled for winter months.

2) Dry and windy conditions resulting in air pollution

If construction is conducted during winter months associated with high wind speed, the clearing of topsoil for construction purposes, could result in ambient dust pollution.

Mitigation measures to be included in the EMP

Planning Phase

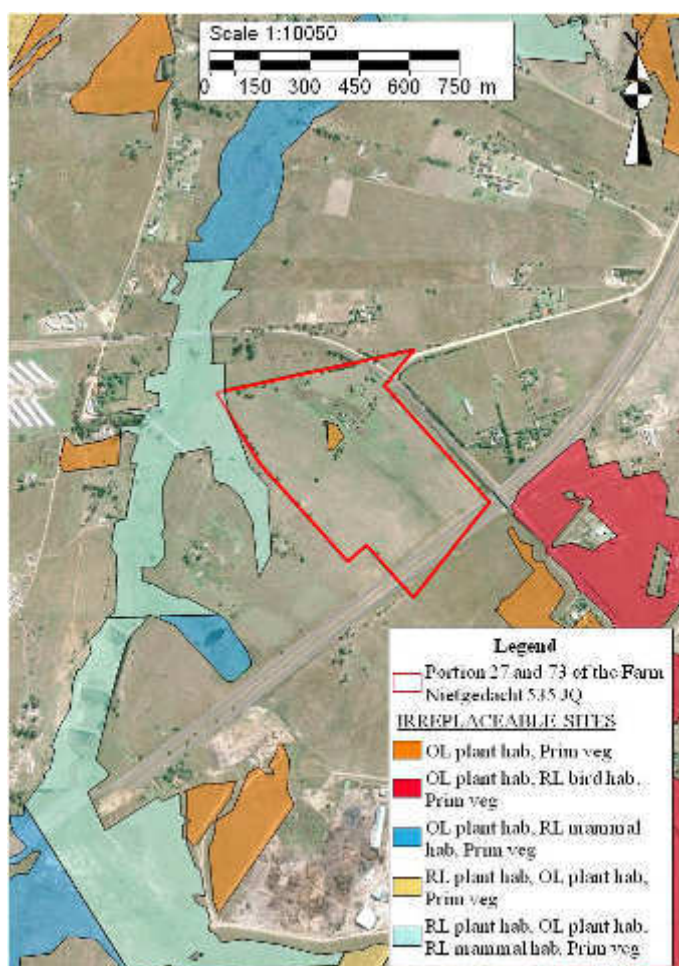
- Dust suppression should be planned for in terms of budget, water supply, mobile plant etc.

The **significance** of the issue **following mitigation** is **Low**.

6.2 THE BIOLOGICAL ENVIRONMENT

6.2.1 Fauna and Flora

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 unprotected areas. According to GDARD C-Plan the study area is located on some of the irreplaceable sites.

Figure 5: Irreplaceable Sites Map

Table 11: Issues and Impacts – Fauna & Flora

	Issue/ Impact	Positive/ Negative/ Neutral ±	Mitigation Possible (Yes/No)
1)	Portion of development site classified as Irreplaceable	-	Yes
2)	Loss of endangered grassland	-	Yes
3)	Loss of sensitive habitats	-	Yes

6.2.2.1 Discussion of issues identified, possible mitigation measures and significance of issue after mitigation – Fauna & Flora

1) Portion of development site classified as Irreplaceable

Due to a small section of the site being classified as Irreplaceable site, this portion of the site has potential for orange listed species to be present.

2) Loss of endangered grassland

Endangered Egoli Granite Grassland vegetation could be lost as a result of development.

3) Loss of sensitive habitats

Sensitive habitats could be lost as a result of the development.

Mitigation measures to be included in the EMP

Planning Phase

- GDARD requested the following to be carried out in terms of Biodiversity assessment in a response letter dated 9 February 2015;
 - vegetation to establish whether specific tree species listed are present on site,
 - birds with specific focus on Red Listed birds prioritized by GDARD; and
 - a Wetland assessment including wetland habitat assessment for specific mammal species as listed;
- Findings and recommendations from the above report to be incorporated into the Final EIA Report.

7. DESCRIPTION OF THE EXISTING SOCIAL ENVIRONMENT

7.1 Archaeology/Cultural History

It terms of the legislation, it is necessary to identify and list the specific legislation and permit requirements, which potentially could be infringed upon by the proposed project.

The necessity and possibilities for the implementation of mitigation measures should also be identified.

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 paleontological 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.

The development exceeds 0.5 ha in extent and therefore triggers a Phase 1 Heritage Impact Assessment.

Table 12: Issues and Impacts – Cultural history

	Issue/ Impact	Positive/ Negative/ Neutral ±	Mitigation Possible (Yes/No)
1)	Potential for archeological/cultural heritage finds on site	-	Yes

7.1.1 Discussion of issues identified, possible mitigation measures and significance of issue after mitigation – Cultural history

1) Potential for archeological/cultural heritage finds on site

Due to development footprint exceeding 0.5ha in extent, a Phase 1 Heritage Impact Assessment is triggered in terms of the National Heritage Resources Act, 1999 (Act No 25 of 1999).

Mitigation measures to be included in the EMP

Planning Phase

- A Phase 1 Heritage Impact Assessment is to be carried out at the development site;
- Findings and recommendations from the above report to be incorporated into the Final EIA Report.

7.2 Agricultural Potential

According to the GAPA 3 the agricultural potential of the soils on the study area are low.

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

Despite having concluded that no Agricultural Potential Study is needed for the proposed application site and that the development of the proposed site will have no negative economic impact on the Agricultural Land of the Gauteng Province, GDARD requested that an Agricultural potential study be carried out in a response letter dated 9 February 2015.

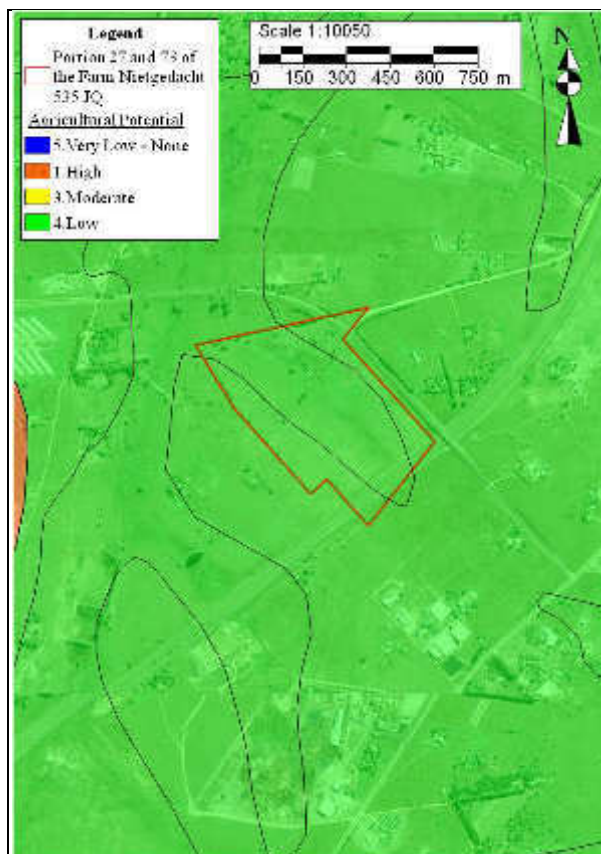


Figure 7: Agricultural Potential Map

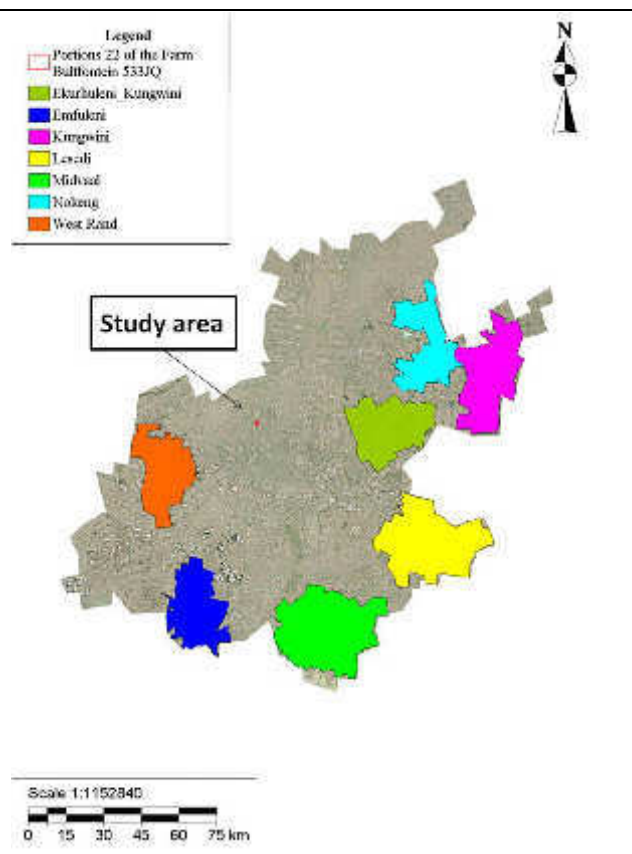


Figure 8: Agricultural Hub Map

Table 13: Issues and Impacts – Agriculture

	Issue/ Impact	Positive/ Negative/ Neutral ±	Mitigation Possible (Yes/No)
1)	Potential for loss of agricultural land	-	Yes

7.2.1 Discussion of issues identified, possible mitigation measures and significance of issue after mitigation – Agricultural potential

1) Potential loss of agricultural land

Despite soil being classified as having low agricultural potential and the development site not forming part of the seven Gauteng Agricultural hubs, GDARD requested for an agricultural potential study to be conducted.

Mitigation measures to be included in the EMP

Planning Phase

- Agricultural Potential Study to be conducted for the development site;
- Findings and recommendations from the above report to be incorporated into the Final EIA Report.

7.4 Institutional Environment

7.4.1 International Level

Relevant International Conventions to which South Africa is a party:

- **Convention relative to the Preservation of Fauna and Flora** in their natural state, 8 November 1993 (London);
- **Convention on Biological Diversity**, 1995
(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).

7.4.2 National Level

7.4.2.1 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.

If the involved authorities do not take the principles of NEMA into consideration when evaluating an environmental report/ document, the involved authority can be held responsible for any damage to the environmental (social, ecological and economical).

Implications for the Development

The proposed mix use development triggers listed activities in terms of NEMA EIA Regulations which requires environmental authorization from GDARD.

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

In terms of section 144 of the National Water Act it is required that the 1:50 and 1:100 year flood line be indicated on all relevant drawings that are being submitted for approval. The study area is affected by the wetland. Section 21 Water Use Licenses will be required for any development which may take place within and /or impact any water resource and or floodlines.

Section 21 DWS (Department of Water and Sanitation) Water Use Licenses are required for the proposed development.

In terms of 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.

The National water Act also required that (where applicable) the 1:50 and 1:100 year flood line be indicated on all the development drawings (even the drawings for the external services) that are being submitted for approval.

Implications for the Development

In terms of the National Water Act, the developer will need water licenses for the proposed development, as the proposed development is influenced by the artificial wetland.

Compiling and submitting a WULA and associated documents to be included in the EMP.

7.4.2.3 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 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 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".

Implications for the Development

Dust and noise pollution during construction will have to be mitigated. Mitigation measures to be included in the EMP.

7.4.2.4 National Heritage Resources Act, 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 Heritage 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.

Implications for the Development

Due to the development footprint exceeding 0.5 ha a Phase 1 Heritage Impact Assessment is required. The requirement for the aforementioned study to be included in the EMP.

7.4.2.5 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.

Implications for the Development

Despite Biodiversity assessments already having been carried out for the proposed development site, GDARD has requested studies to focus on specific fauna and flora species and therefore the biodiversity assessment will have to be repeated with focus on the species as requested. This requirement will be included in the EMP.

7.4.2.6 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.

Implications for the Development

Due to portions of the proposed development site being classified as irreplaceable specialist biodiversity assessments have been carried out. Refer to 7.4.2.5.

7.4.2.7 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.

Implications for the Development

The proposed development site is not a declared protected area, however a small portion of the development site is classified as Irreplaceable in terms of the Gauteng Conservation Plan. Refer to 7.4.2.5.

7.4.2.8 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 DFA, 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;

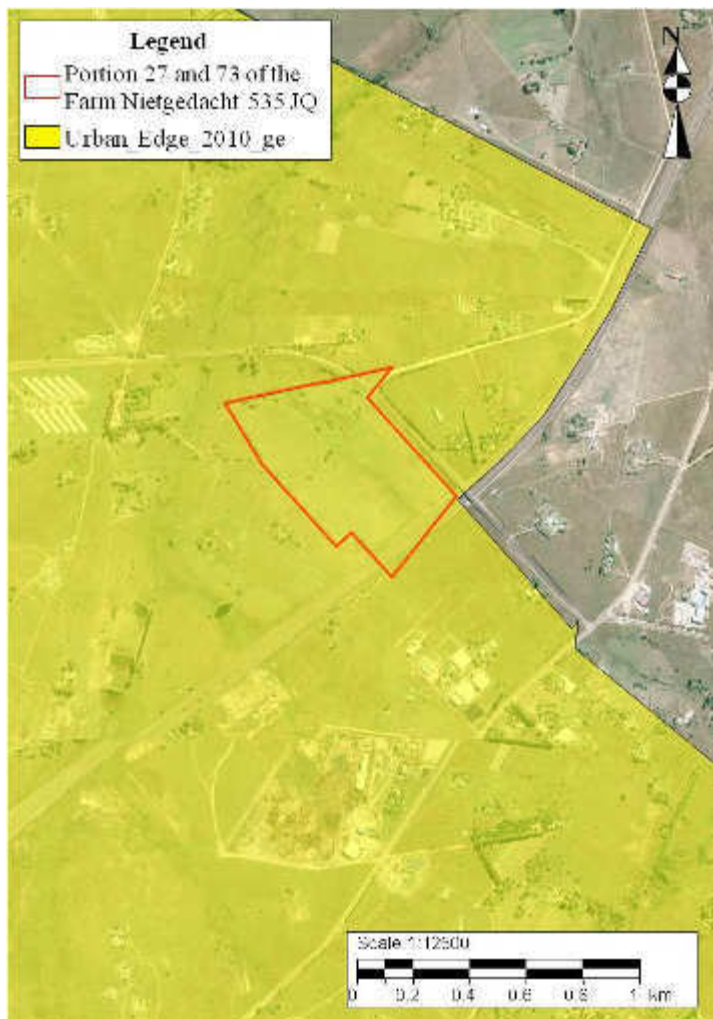
7.4.3 On a Local level

Planning Responsibilities of the Involved Local Authority

In terms of the Local Government Transitional Act, 1993 and recently the Municipal Systems Act, 2000; the prerogative to plan a development within its jurisdictional area; is vested in the local authority involved. In order to ensure that the proposed developments comply with the standards and requirements of the involved local authorities (City of Johannesburg Metropolitan Municipality), the relevant officials were involved in the planning of the project from the start.

7.4.3.1 Gauteng Urban Edge

The Gauteng Spatial Development Framework 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.



According to Mr. Neels Du Toit of the Department (of Local Government and Housing) the department developed a new 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, 2011. **(Refer to figure 9)**

Figure 9: Gauteng Urban Edge Map

7.4.3.2 Lanseria Development Framework (City of Johannesburg)

The proposed density also 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”.

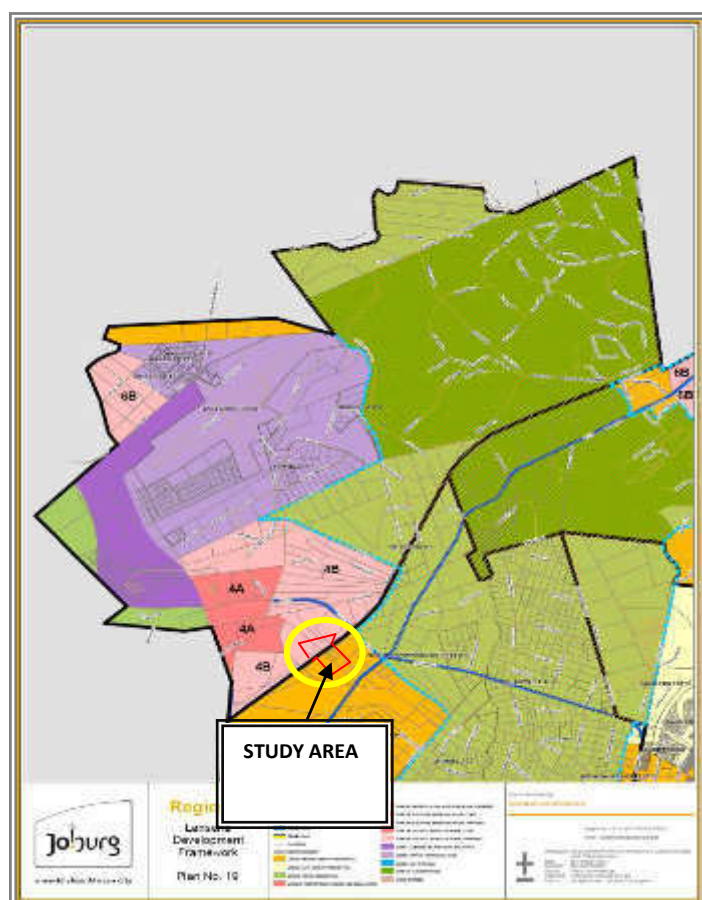


Figure 10: Lanseria Development Framework

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 states to “encourage mixed land uses that complement one another, as per the land management zone”. One of the guidelines for objective 1, states that Land Use Management Standards as contained in the Land Use Management Schedule, must apply.

In terms of the Kya Sand and Lanseria Development Frameworks the site falls inside the Metropolitan mixed-use nodal periphery (Zone 4B); **Refer to Figure 10.**

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.

Another guideline of objective 1 states, 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.

Implications for the Development

The proposed development is in line with the future planning for the area.

7.4.3.3 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.

Implications for the Development

The act applies to the proposed development due to the R552 transecting the northeastern corner of the development site.

GDRT to be consulted in terms of the development of the site and the implications of the R552 road. To be included in the EMP.

7.4.3.4 Local Government Municipal Systems Act, 2000 (Act No. 32 of 2000)

This Act was introduced to provide for the core principles, mechanisms and processes that are necessary to enable municipalities to move progressively towards the social and economic upliftment of local communities, and ensure universal access to essential services that are affordable to all.

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

Implications for the Development

The local authority has to confirm availability of services for the proposed development in writing. To be included in the EMP.

7.4.3.5 GDARD Draft Ridges Policy

This policy is provided for the protection, conservation, and maintenance of ridges within the Gauteng Province. According to the GDARD Draft Ridges Policy no development should take place on slopes steeper than 8.8%.

Implications for the Development

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

7.4.3.6 Draft Policy on the Protection of Agricultural Land (2006)

Seven agricultural hubs have been identified within Gauteng.

Implications for the Development

The study area does not fall within an Agricultural Hub as identified by GDARD in 2006. The Draft policy on the protection of Agricultural Land (2006) is therefore not applicable to the proposed development. **(Refer to the Agricultural Hub Map, Figure 8)**

7.4.3.7 City of Johannesburg Metropolitan Municipal Water Services By-law, 2003

According to the City of Johannesburg Metropolitan Municipality (CoJMM) Water Services Bylaw, the developer has to submit an application to the Municipality for bulk water supply and sewerage services which will serve as an agreement between the Municipality and the Developer, requiring payment of service fees.

Implications for the Development

The developer will have to submit an application to the CoJMM/Johannesburg Water for bulk water supply and sewerage services. CoJ to supply written confirmation of availability of services and document to be included in the Final EIA Report.

7.4.3.8 Greater Johannesburg Metropolitan Electricity By-laws

Section 3(2) of the By-law states that no person shall use electricity unless a consumers' agreement has been concluded with the Council.

Implications for the Development

The developer must enter into a consumers' agreement from City of Johannesburg Council for the use of electricity.

7.4.3.9 City of Johannesburg Biodiversity Strategy and Action Plan, 2015

The purpose of this document is to present the vision, guiding principles, strategic objectives, goals and action plans for the protection, use and conservation of biodiversity within the City of Johannesburg.

Implications for the Development

The applicability to the proposed development is to be established and incorporated into the Final EIA Report.

7.4.3.10 City of Johannesburg Wetland Protection and Management Plan 2009

Document caters for the protection of wetlands occurring within the Municipal boundaries.

Implications for the Development

Document to be reviewed and action plans to be considered in terms of the proposed development, and incorporated into the Final EIA Report.

7.4.3.11 City of Johannesburg Open Space Framework

Document caters for retaining open space within the Municipality for the purpose of leisure.

Implications for the Development

Document to be reviewed and action plans to be considered in terms of the proposed development, and incorporated into the Final EIA Report.

7.5 Visual Environment

The following visual assessment criteria (see Table 14) has been used to determine the impact of the proposed development on the state of the environment – the significance is indicated by the respective color coding for each of the impacts, being either high, medium or low:

Table 14: 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 has a definite character / sense of place	The site or surrounding environment has some character	The site or surrounding 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	If uninterrupted view	If uninterrupted view

	distances to the site are > 5 km	distances to the site are < 5 km but > 1 km	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

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

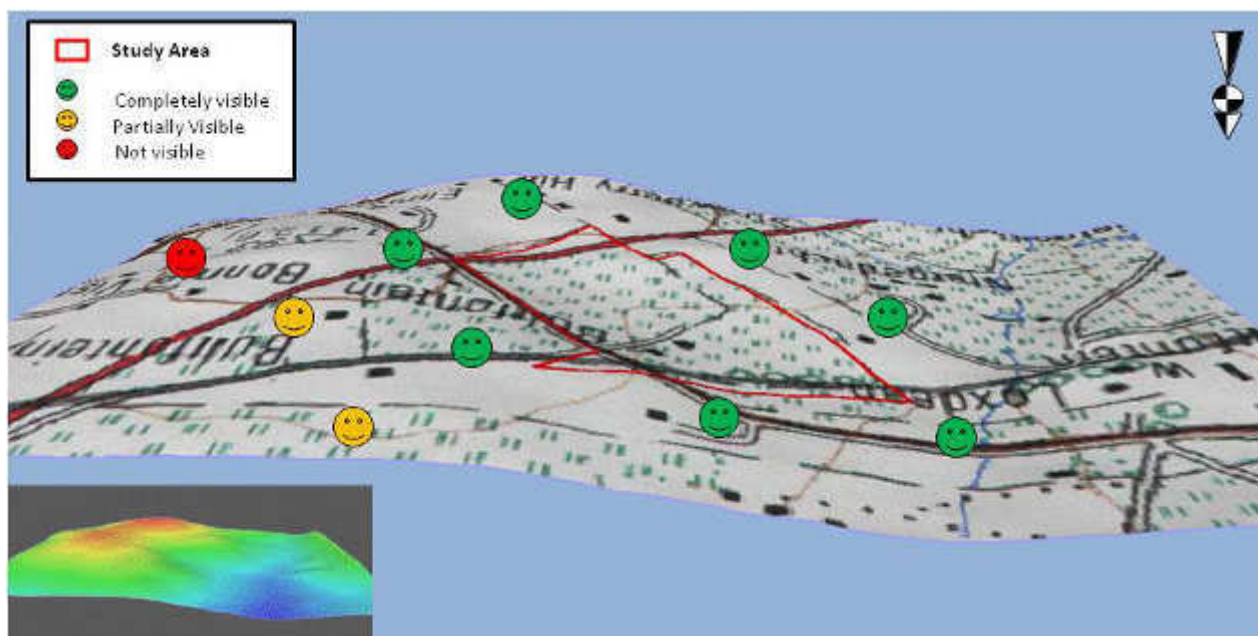


Figure 11: Visual Assessment

Table 15: Issues and Impacts – Visual

	Issue/ Impact	Positive/ Negative/ Neutral ±	Mitigation Possible (Yes/No)
1)	Visual impact of the development on	-	Yes

	neighboring land users		
2)	Reflective structures affecting drivers vision	-	Yes

7.5.1 Discussion of issues identified, possible mitigation measures and significance of issue after mitigation – Visual impact

1) Visual impact of the development on neighboring land users

Development site is visible from surrounding properties and roads and could negatively affect aesthetics and visibility.

Mitigation measures to be included in the EMP

Planning Phase

- 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 colors. Black or charcoal colored roofs will blend in tastefully with the surrounding environment.
- The color scheme should be taken from the palette of colors in the natural surroundings.
- The architectural styles, colors, textures and construction materials used must fit in with the surrounding natural environment.
- 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.

Rehabilitation Phase

- 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.

2) Reflective structures affecting drivers vision

Development site is visible from surrounding roads and reflective surfaces could negatively affect drivers visibility.

Mitigation measures to be included in the EMP

Planning Phase

- Construction materials used should be non-reflective.

7.6 Sense of Place

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.

Table 16: Issues and Impacts – Sense of place

	Issue/ Impact	Positive/ Negative/ Neutral ±	Mitigation Possible (Yes/No)
1)	Development could have negative effect on sense of place.	-	Yes

7.6.1 Discussion of issues identified, possible mitigation measures and significance of issue after mitigation – Sense of place

1) Development could have negative effect on sense of place.

Due to natural surroundings, the development could negatively affect the sense of place of the area.

Mitigation measures to be included in the EMP

Planning Phase

- Natural open areas to be retained as part of the development.

7.7 Demography

Demographics, population composition, income profiles and other population statistics always play a very important role to evaluate the need for additional land uses.

Studies of demographics are very important to ascertain the need and viability of a new development, especially one of this magnitude. Refer to the Town planners memorandum attached as **Annexure D4i**.

7.8 SERVICES

7.8.1 Water

Most of the land around the site is still agricultural and very little bulk infrastructure has been installed. The only water supply line in the area feeds mainly the Lanseria area at present. It consists of a 300mm diameter supply pipeline from the Honeydew reservoir in the south (top water level 1672.8m). The line runs to the west of Lanseria x 53. Capacity in this line is already under pressure, due to the development at and around Lanseria.

It is proposed to provide water to the site from a 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 proposed new 15Mℓ Lion Park reservoir next to Malibogwe Drive and a 450mm diameter pipeline will link to the reservoir.

From the Lion Park Reservoir a planned 600mm diameter feeder line will supply water 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.

Table 17: Issues and Impacts – Water reticulation

	Issue/ Impact	Positive/ Negative/ Neutral ±	Mitigation Possible (Yes/No)
1)	Availability of water reticulation services	-	Yes

7.8.1.1 Discussion of issues identified, possible mitigation measures and significance of issue after mitigation – Water reticulation

1) Availability of water reticulation services

Considering the proposed development occurs within an area surrounded by vacant land, water reticulation services are required.

Mitigation measures to be included in the EMP

Planning Phase

- Municipality to confirm in writing that water infrastructure is available for the proposed development.
- Design and install bulk water infrastructure;
- Register servitudes if required.

7.8.2 Sewer

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.

The Master Planning for the area allows for two possible alternatives. The first Alternative, provides for a pump station at Diepsloot and no connection of that system to the Lanseria System. The second alternative links the Blue Hills, Summerset, Diepsloot and Dainfern areas to the Lanseria System. The effect on this proposed development is that some of the outfall sizes increase.

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

Table 18: Issues and Impacts – Sewerage reticulation

	Issue/ Impact	Positive/ Negative/ Neutral ±	Mitigation Possible (Yes/No)
1)	Availability of sewerage reticulation services	-	Yes

7.8.2.1 Discussion of issues identified, possible mitigation measures and significance of issue after mitigation – Sewerage reticulation

1) Availability of sewerage reticulation services

Considering the proposed development occurs within an area surrounded by vacant land, sewerage reticulation services are required.

Mitigation measures to be included in the EMP

Planning Phase

- Municipality to confirm in writing that sewerage infrastructure can be provided for the proposed development and that existing Sewage Treatment Works can handle the additional load.
- Register servitudes if required.

7.8.3 Storm water

Storm water run-off is currently drained from the N14 into a manmade channel draining through the development site. Development of the site would result in more impermeable surfaces and increased run-off.

Table 19: Issues and Impacts – Storm water

	Issue/ Impact	Positive/ Negative/ Neutral ±	Mitigation Possible (Yes/No)
1)	Increase storm water run-off	-	Yes

7.8.3.1 Discussion of issues identified, possible mitigation measures and significance of issue after mitigation – Storm water

1) Increase storm water run-off

Increase in storm water run-off could have a negative impact in the development as well as the artificial wetland on site.

Mitigation measures to be included in the EMP

Planning Phase

- Storm water should be carefully managed on site to prevent any accumulation of surface water against or near buildings.

- A Storm Water Management Plan for the Lanseria x 53 will be compiled as part of the WULA and included in the Final EIA Report.
- All external storm water pipes or pipes entering or existing the development site has to be indicated on the final layout plan.
- Register servitudes if required.

7.8.4 Electricity

Although the development is situated within the City of Johannesburg urban boundary, the supply authority in the area is Eskom.

There is currently no bulk capacity available in the nearby area to supply a development such a Lanseria x 53. The existing networks in the area are 11/22kV overhead agricultural/rural electrification networks which will not be able to cater for sufficient bulk supply, even if upgraded.

Eskom has made provision for a bulk substation in the nearby area in the 2010-2020 master plan. The capacity which Eskom has planned for is still to be finalized.

The proposed Eskom substation could possibly be located on the nearby, proposed Lanseria X51, which is located west of the development. Additional 132kV overhead lines that will supply the new substation are in the planning stages, and will probably affect the land-use of the proposed development.

Table 20: Issues and Impacts – Electricity supply

	Issue/ Impact	Positive/ Negative/ Neutral ±	Mitigation Possible (Yes/No)
1)	Lack of electrical infrastructure	-	Yes

7.8.4.1 Discussion of issues identified, possible mitigation measures and significance of issue after mitigation – Electricity

1) Lack of electrical infrastructure

The existing electrical infrastructure is insufficient to cater for the proposed development.

Mitigation measures to be included in the EMP

Planning Phase

- Additional electrical infrastructure reticulation required for the development to be designed and approved by City Power and Eskom. Approval to be included in the Final EIA Report.
- Register servitudes if required.

7.8.5 Solid waste

Preliminary investigations indicate that the involved local authority will be responsible for the removal of domestic waste generated during the operational phase of the project.

Table 21: Issues and Impacts – Solid waste

	Issue/ Impact	Positive/ Negative/ Neutral ±	Mitigation Possible (Yes/No)
1)	Environmental pollution due to solid waste generated	-	Yes

7.8.5.1 Discussion of issues identified, possible mitigation measures and significance of issue after mitigation – Solid waste

1) Environmental pollution due to solid waste generated

The proposed development will generate solid waste both during construction and operation.

Mitigation measures to be included in the EMP

Planning Phase

- Local authority to confirm in writing that waste removal service can be provided for the proposed development.

7.8.6 Traffic

The upgrade of Malibongwe Drive has improved the node's accessibility locally and regionally, via the N14 Highway, which abuts the proposed development. In the distant future some strategic assessment will be needed of major upgrades and new planned links, including public transport, which may have a direct bearing on the node's viability.

7.8.6.1 Access

Access to the proposed development will have to be routed via Malibongwe Drive and Road R552, which can be accessed via the National Road (N14).

7.8.6.2 Internal Road Network

The design of the internal road system will be influenced by:

- Geology, drainage and natural features;
- Orientation of erven;
- Access; and
- Services and the provision of infrastructure.

Table 22: Issues and Impacts – Traffic

	Issue/ Impact	Positive/ Negative/ Neutral ±	Mitigation Possible (Yes/No)
1)	Increase in traffic volume	-	Yes

7.8.5.1 Discussion of issues identified, possible mitigation measures and significance of issue after mitigation – Traffic

1) Increase in traffic volume

The proposed development will result in an increase in traffic volume and requires access to and from.

Mitigation measures to be included in the EMP

Planning Phase

- TIA to be carried out for the proposed development to ascertain roads to be upgraded, access to the development, and new roads to be constructed. The TIA report will be included in the Final EIA Report
- GDRT to be included as I&AP with specific reference to the R552.
- Register servitudes if required.

8. PUBLIC PARTICIPATION

Please Refer to **Annexure E** for Public Participation.

8.1 Purpose of Public Participation

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. This will allow stakeholders 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 which 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.

8.2 Identification of Interested and Affected Parties

Potential Interested and Affected Parties relevant to the project and the surrounding area were listed. The list was updated during the process of information gathering and with information forthcoming from discussions with various role players and authorities.

The following people were identified as I&AP's:

Table 23: I&AP identified

Organisation /Body	Postal Address	Contact person	Tel No	Fax No
National and Provincial Government				
Gauteng Agriculture, Forestry & Fishery	Private Bag X120 Pretoria, 0001	B N de Lange Nhlakanipo Dlamini	012 319 7634	012 329 5938
Department of Water Affairs	285 Schoeman Street, Pretoria, 0001	T L Mathebe	012-392 1413	012-392 1408
Gauteng Department of Roads & Transport				
Council Geo-Science		igrobler@geoscience.org.za		
PHRAG		maphata.ramphela@gauteng.gov.za		
Eskom		central@eskom.co.za		
SANRAL		schmidt@nra.co.za		
Department of Land Claims		Ms Nomfundo Gobodo CLCC@ruraldevelopment.gov.za	012 312 8883	
Municipality				
Joburg: City of Johannesburg	P O Box 1049	Etienne Allers	011 587 4230	0866277516

Organisation /Body	Postal Address	Contact person	Tel No	Fax No
Environmental Regulatory Services	Johannesburg, 2000			
Registered as I&AP				
Janiner von Zeuner	Janine@twotenchemi cals.co.za		011 300 9917/8	
Atwell Malherbe Associates (for Orange Country Investments CC)	ama123@mweb.co.za		011 463 1188	
JF Woortmeyer	jfwmeier@gmail.com	Jonathan Woortmeyer		
Neighbouring Property Owners				
	PO Box 34109 Erasmia, 0023	H C Maritz		
	P O Box 560 Fourways, 2055	R D Lawrence		
	P O Box 3885 Randburg	J M Liebenberg		
	P O Box 1858 Bromhof, 2154	Croft A		
	P O Box 2907 Parklands, 2121	Hertfort Estates, D Gamsy		
	P O Box 1745 Pinegowrie, 2123	Orange County Investments		
	P O Box 268 Florida Hills, 1716	Cradle City, AD van Wyk		
	P O Box 786, Laneria, 1748	M C Barnard		
	P O Box 1163 Houghton, 2041	Coral Investments Property, J Shtein		
	P O Box 1858 Bromhof, 2154	A Croft		
	P O Box 50581 Wierda Park, 0149	P J Maritz		
	P O Box 765 Rivonia, 2128	SDH van Bijlon		
	P O Box 181 Polokwane, 0699	Chieftan Real Estates Inc		
	P O Box 52368 Saxonworld, 2132	Falcon Forest Trading 73 R Sanderson		
	P O Box 34027 Erasmia, 0023	Darqawi Foundation M Fakir		
	P O Box 34071 Pretoria, 0001	H A Steinberg		
	P O Box 55835 Arcadia, 0007	Viador S A Mohamed Adam		

Organisation /Body	Postal Address	Contact person	Tel No	Fax No
	P O Box 14430 Laudium, 0037	Abdullah, 2B		
	P O Box 53211 Centurion, 0046	L A Naidoo		

8.3 Notifications to I&AP

Stakeholders (I&AP's) were notified of the Environmental Impact Assessment Process for the proposed mix use development through:

- 1) A site notice that was erected (at a prominent point on the study area) on 12 August 2015 **(Refer to Annexure E1 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 12 August 2015 **(Refer to Annexure E2 for proof of public notice)**;
- 3) An advertisement was placed in the Beeld newspaper on Friday, 12 August 2015 **(Refer to Annexure E3 for proof of advertisement)**; and
- 4) The Draft EIA Report will be available for review by I&AP's for a period of 40 days and comments received will be addressed in the Final EIA Report.

Since commencement of the Environmental Authorization application process three (3) Interested and Affected Parties have registered **(refer to Annexure E7 for a list of registered Interested and Affected Parties)**; and comments were received from the following authorities; GDARD, DWS, CoJ, SAHRA.

8.4 Comments from I&AP's

The following comments were received from I&AP's **(See Annexure E6 for Comments & Response Report)**.

Table 24: Comments from I&AP

Issue	Commentator	Date	Response
Objection: already oversupply of retail space. Register as I&AP	Attwell Malherbe Associates	October 2011	Comments on file.
Register as I&AP	City of Johannesburg	11 July 2012	None required
Register as I&AP	Janiner von Zeuner	28 September 2011	None required
Register as I&AP. Request info	Jonathan Woordmeyer	28 September 2011	Will receive a copy of the report.
Request geotechnical investigation,	Dept. Water Affairs	24 October 2012	None required

Storm water management plans.			
Request Phase 1 HIA to be conducted	SHARA	5 December 2013	Phase 1 HIA to be conducted underway
Requested info and specialist studies to be included in EIA Report	GDARD	9 February 2015	Specialist studies and info requested to be included in EIA Report

9. COMPARATIVE ASSESSMENT BETWEEN ALTERNATIVE 1, 2 AND ALTERNATIVE 3

9.1 *Anticipated impacts, including cumulative impacts*

The impacts/ aspects (beneficial and adverse) of the proposed mix use development (Alternative 1, Alternative 2, and Alternative C "**Proposal**") on the receiving environment were identified. The above impacts, as well as the affected environmental characteristics, are indicated in **Tables 25 and 26** below.































































































Table 25: Comparative Assessment of impacts and issues before Mitigation

Environmental Aspects <u>Key to impacts:</u> 😊 l– Lower positive 😊 m– Medium positive 😊 h– Higher positive 😞 l– Lower negative 😞 m–Medium negative 😞 h– Higher negative 😐- Neutral	Physical				Biological		Socio-Economical								Institutional				Total of Impacts	
	Geology and Soils	Hydrology	Topography	Climate	Fauna	Flora	Qualitative Environment Visual, Noise, Pollution, Security	Compatibility of Land-Use	Availability of municipal services	Upgrading of Municipal Services	Economical Impact Local Authority	Economical Impact I&AP's	Economical Impact Private Sector	Cultural and Historical	Impact on high agricultural potential land	In line with IDP	In line with SDF or other frameworks And open space plans	In line with policies and guidelines	In line with Water Act and other legislation	
CONSTRUCTION PHASE																				
Issues and Impacts																				
Alternative 1 “No Go”	😐	😐	😐	😐	😊	😊	😐	😞 m	😊	😐	😞 m	😊	😞 h	😐	😐	😞 h	😞 m	😞 l	😊	😊 x 13 😞 l x 1 😞 m x 3 😞 h x 2
Alternative 2 “Residential Only”	😞 h	😞 m	😐	😞 l	😞 h	😞 h	😞 m	😞 m	😞 l	😞 m	😐	😞 m	😊 h	😐	😞 h	😊 l	😊 l	😊 h	😊 h	😊 h x 3 😊 l x 2 😐 x 3 😞 l x 2 😞 m x 5 😞 h x 4

Alternative 3 "Mixed Use" PROPOSAL	⊖ h	⊖ m	⊕	⊖ l	⊖ h	⊖ h	⊖ m	⊖ m	⊖ l	⊖ m	⊕	⊖ m	⊕ h	⊕	⊖ h	⊕ h	⊕ h	⊕ h	⊕ h	⊕ h x 5 ⊖ x 3 ⊖ l x 2 ⊖ m x 5 ⊖ h x 4
OPERATIONAL PHASE Issues and Impacts																				
	Geology/ soils	Hydrology	Topography	Climate	Fauna	Flora	Qualitative Env	Land-Use	Municipal Serv	Upgrading of MunServ	Econ Impact LA	Econ Impact I & AP's	Econ Impact Priv Sector	Cult & Hist	Agric Potential	IDP	SDF, Open Space Plan	Policies/ Guidelines	Acts other legislation	
Alternative 1 "No Go"	⊕	⊕	⊕	⊕	⊕	⊕	⊖ l	⊖ l	⊖ m	⊖ m	⊖ h	⊖ l	⊖ h	⊕	⊕ l	⊖ m	⊕	⊖ l	⊖ l	⊕ l x 1 ⊖ x 8 ⊖ l x 5 ⊖ m x 3 ⊖ h x 2
Alternative 2 "Residential Only"	⊖ h	⊖ m	⊕	⊖ l	⊖ m	⊖ m	⊕ m	⊕ m	⊕ h	⊕ h	⊕ m	⊕ l	⊕ m	⊕	⊕ l	⊕ l	⊕ l	⊕ h	⊕ h	⊕ h x 4 ⊕ m x 4 ⊕ l x 3 ⊖ x 2 ⊖ l x 1 ⊖ m x 3 ⊖ h x 2

[illegible]

Environmental Aspects <u>Key to impacts:</u> 😊 I- Lower positive 😊 m- Medium positive 😊 h- Higher positive 😞 I- Lower negative 😞 m-Medium negative 😞 h- Higher negative 😐- Neutral	Physical				Biological		Socio-Economical								Institutional				Total of Impacts	
	Geology and Soils	Hydrology	Topography	Climate	Fauna	Flora	Qualitative Environment Visual, Noise, Pollution, Security	Compatibility of Land-Use	Availability of municipal services	Upgrading of Municipal Services	Economical Impact Local Authority	Economical Impact I&AP's	Economical Impact Private Sector	Cultural and Historical	Impact on high agricultural potential land	In line with IDP	In line with SDF or other frameworks And open space plans	In line with policies and guidelines	In line with Water Act and other legislation	
CONSTRUCTION PHASE																				
Issues and Impacts																				
Alternative 1 "No Go"	😐	😐	😐	😐	😐	😐	😐	😞 m	😐	😐	😞 m	😐	😞 h	😐	😐	😞 h	😞 m	😞 l	😐	😐 x 13 😞 l x 1 😞 m x 3 😞 h x 2

Alternative 2 "Residential Only"	 h	 m		 l	 m	 m	 l	 l		 l		 l	 h		 h	 l	 l	 h	 h	 h x 3  l x 2  x 4  l x 5  m x 3  h x 2
Alternative 3 "Mixed Use" PROPOSAL	 h	 m		 l	 m	 m	 l	 l		 l		 l	 h		 h	 h	 h	 h	 h	 h x 5  x 4  l x 5  m x 3  h x 2
OPERATIONAL PHASE Issues and Impacts																				
	Geology/ soils	Hydrology	Topography	Climate	Fauna	Flora	Qualitative Env	Land-Use	Municipal Serv	Upgrading of MunServ	Econ Impact LA	Econ Impact I & AP's	Econ Impact Priv Sector	Cult & Hist	Agric Potential	IDP	SDF, Open Space Plan	Policies/ Guidelines	Acts other legislation	
Alternative 1 "No Go"							 l	 l	 m	 m	 h	 l	 h		 l	 m		 l	 l	 l x 1  x 8  l x 5  m x 3  h x 2
Alternative 2 "Residential Only"																				 h x 4  m x 4

	m	m			m	m	m	m	h	h	m	l	m		h	l	l	h	h	☺ l x 3 ☹ x 3 ☹ m x 4 ☹ h x 1
Alternative 3 "Mixed Use" PROPOSAL	☹ l	☹ l	☹	☹	☹ m	☹ m	☹ l	☺ h	☺ h	☺ h	☺ m	☺ l	☺ h	☹	☹ h	☺ h	☺ h	☺ h	☺ h	☺ h x 8 ☺ m x 1 ☺ l x 1 ☹ x 3 ☹ l x 3 ☹ m x 2 ☹ h x 1

9.2 Competitive assessment between proposal and alternatives

From Table 26 above it can be concluded that Alternative 3 (the development proposal) is the preferred alternative.

The biological impacts of the “no go” option is less than that of alternatives 2 and 3, which are more or less equal. Mitigation measures are not significant.

From a social point of view both alternatives 2 and 3 are regarded as desired due to the great demand for affordable housing as well as business sites in the area. Both alternatives would contribute to the upgrading of services and infrastructure in the area as well as the generation of employment opportunities. Alternative 3 would, however, supply significantly more employment opportunities during the operational phase of the development.

From a socio-economic point of view Alternative 3 (the development proposal) is the preferred alternative due to the integration of urban infrastructure, increased efficiencies in service delivery and the creation of housing and job opportunities.

Alternative 3 (mixed use development) is also the preferred alternative from an institutional point of view. The study area is earmarked for future nodal uses in terms of the RSDF and Lanseria Development Framework 2020.

From an integrated environmental point of view (biological, physical, socio-economical and institutional environments) Alternative 3 remains the preferred development alternative.

10. SIGNIFICANCE ASSESSMENT

10.1 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:

- | | | | |
|--------------------------|-----------------|---|--|
| <input type="checkbox"/> | Improbable | - | Low possibility of impact to occur either because of design or historic experience.
Rating = 2 |
| <input type="checkbox"/> | Probable | - | Distinct possibility that impact will occur.
Rating = 3 |
| <input type="checkbox"/> | Highly probable | - | Most likely that impact will occur.
Rating = 4 |
| <input type="checkbox"/> | 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:

- | | | | |
|--------------------------|------------------|---|---|
| <input type="checkbox"/> | Low intensity | - | natural and manmade functions not affected – Factor 1 |
| <input type="checkbox"/> | Medium intensity | - | environment affected but natural and manmade functions and processes continue - Factor 2 |
| <input type="checkbox"/> | High intensity | - | environment affected to the extent that natural or manmade 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:

- | | | | |
|--------------------------|-------------|---|---|
| <input type="checkbox"/> | Short term | - | <1 to 5 years - Factor 2 |
| <input type="checkbox"/> | Medium term | - | 5 to 15 years - Factor 3 |
| <input type="checkbox"/> | Long term | - | impact will only cease after the operational life of the activity, either because of natural process or by human intervention - factor 4. |
| <input type="checkbox"/> | 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:

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

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

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.

In correspondence received from GDARD some officials were of the opinion that the significance methodology used by Bokamoso applies a simple mathematical formula to environmental aspects with significantly different sensitivity values, which might or might not give an inaccurate final significance value.

The significance methodology used by Bokamoso was prescribed to Environmental Consultants in courses in impact assessments. No methodology can be accurate to a numerical value where the environment is concerned, because it cannot be measured. Numerical values are only an indication of the significance or severance of impacts. If we do not agree with the outcome of the assessment, we will adjust the numerical value to reflect a more realistic significance. The methodology only acts as an aid to the Environmental Consultant and the consultant need to use his/her experience in the field together with the methods in order to reach a realistic significance of impacts. Bokamoso, in particular Ms. Lizelle Gregory, has extensive experience in the field of impact assessments.

10.2 Significance Assessment of Anticipated Impacts of the Preferred Alternative

Impacts indicated under each section of the environment were each assessed according to the above methodology. **Table 27** below contains the results of the significance assessment.

Table 27: Result of significance assessment of impacts identified to be associated with the proposed mix use development (after mitigation)

Impact	Probability Rating	Severity Rating		Severity Factor	Severity Rating	Significance Rating
		Intensity	Duration			
CONSTRUCTION PHASE						
Beneficial Impacts						
The eradication of weeds and exotic invaders	5	4	3	12	4	20 High
Job creation	5	4	2	8	3	15 Medium
Conservations of sensitive environments	3	2	2	4	2	6 Low
Adverse Impacts						
Stability of structures due to collapsible and expansive soils	2	1	4	4	2	4 Low
Shallow Groundwater table resulting in accumulation of surface water	3	1	4	4	2	6 Low
Increased storm water run-off due to impermeable surfaces	3	1	4	4	2	6 Low
Possible presence of wetland and its integrity	2	1	4	4	2	4 Low
Visibility from surrounding land and roads	4	1	4	4	2	8 Medium
Wet conditions deterring construction and rehabilitation	2	1	2	2	2	4 Low
Dry and windy conditions resulting in air pollution	2	1	2	2	2	4 Low
Potential loss of orange listed flora species	2	1	4	4	2	4 Low
Loss of endangered grassland	2	1	4	4	2	6 Low
Loss of sensitive habitats	2	1	4	4	2	6 Low
Potential for archeological/cultural heritage finds on site	2	1	2	2	2	4 Low
Potential for loss of agricultural land	2	1	2	2	2	4 Low
Reflective structures affecting drivers vision	3	1	2	2	2	6 Low
Development could have negative effect on sense of place.	3	1	2	2	2	6 Low
Availability of water reticulation services	3	1	2	2	2	6 Low
Availability of sewerage reticulation services	3	1	2	2	2	6 Low
Lack of electrical infrastructure	3	1	2	2	2	6 Low
Environmental pollution due to solid waste generated	2	1	2	2	2	4 Low
Increase in traffic volumes	4	1	2	2	2	8 Medium

OPERATION PHASE						
Beneficial Impacts						
The proposed construction of a mix use development will be in line with the local frameworks, guidelines, and policies etc.	5	4	4	16	5	25 High
Job creation	5	2	4	8	3	15 Medium
Provision of basic services	5	2	4	8	3	15 Medium
Provision of housing	5	2	4	8	3	15 Medium
Social facilities	3	2	4	8	3	9 Medium
Protection of sensitive habitat	4	2	4	8	3	12 Medium
Adverse Impacts						
Stability of structures due to collapsible and expansive soils	2	2	4	8	3	6 Low
Shallow Groundwater table resulting in accumulation of surface water	3	1	4	4	2	6 Low
Increased storm water run-off due to impermeable surfaces	3	1	4	4	2	6 Low
Possible presence of wetland and its integrity	2	1	4	4	2	4 Low
Visibility from surrounding land and roads	3	1	4	4	2	6 Low
Reflective structures affecting drivers vision	2	2	4	8	3	6 Low
Development could have negative effect on sense of place.	3	1	4	4	2	6 Low
Environmental pollution due to solid waste generated	2	2	4	8	3	6 Low
Increase in traffic volumes	4	2	4	8	3	12 Medium

10.3 Discussion of Significance Assessment

Several beneficial impacts with a high significance rating are associated with the proposed mix use development, considering it is in line with local development policy. The Draft Environmental Management Plan (**Refer to Annexure F**) contains measures to achieve maximum gain from the above beneficial impacts. 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.

None of the adverse impacts associated with the proposed mixed use development have a High impact following the implementation of mitigation measures. Of the nineteen adverse impacts associated with the construction phase only two have a medium significance following implementation of mitigation measures and of the nine adverse impacts associated with the operational phase of the development, only one has a medium significance following implementation of mitigation.

Measures that are recommended in this report and the Draft Environmental Management Plan will mitigate the 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 mixed use development to be known as Lanseria X53.

11. CONCLUSION

No “fatal flaws” were identified that could prevent the proposed project from being executed.

From an assessment of the biophysical, social-economic, cultural, and legislative environments it is evident that the proposed development – Alternative 3 is in line with local policies and frameworks and potential impacts identified can be sufficiently mitigated as not to detrimentally affect the environment.

The proposed layout will further be refined by conducting additional specialist studies before producing a final layout plan to be included in the Final EIA Report.

12. RECOMMENDATIONS

Based on the above-mentioned information supplied and the conclusions that were made, it is suggested that the Draft EIA be accepted and that the applicant be allowed to continue finalizing the EIA for the project.

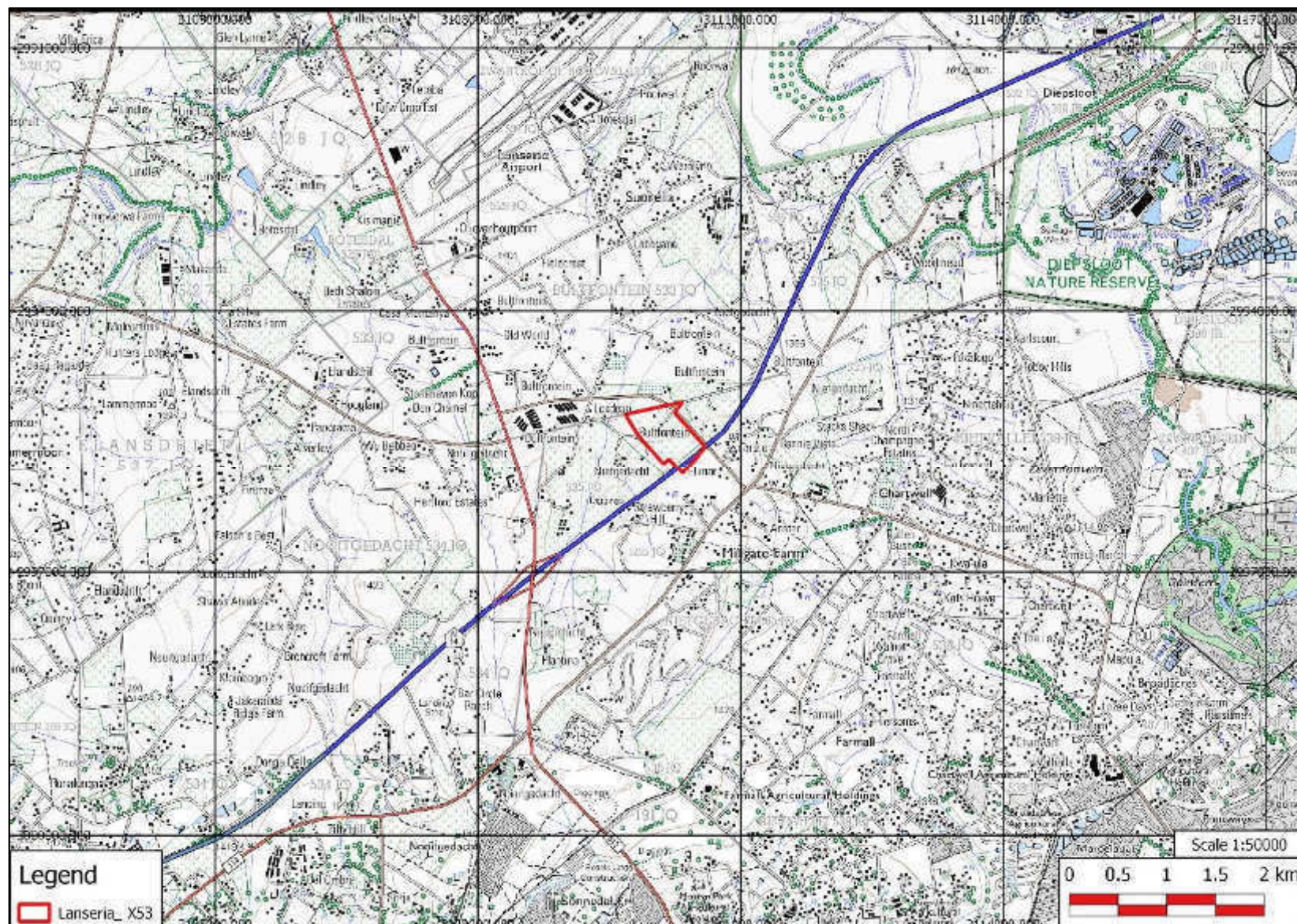
The Final EIA Report must, amongst others, include the following information/comply with the following documents:

- The approved Plan of Study for EIA;
- The specialist reports listed by Bokamoso in this Draft EIA Report;
- Additional specialist inputs and other relevant information listed by the relevant authorities.

ANNEXURE A:

ENLARGED FIGURES/MAPS

Lanseria X53 Locality Map



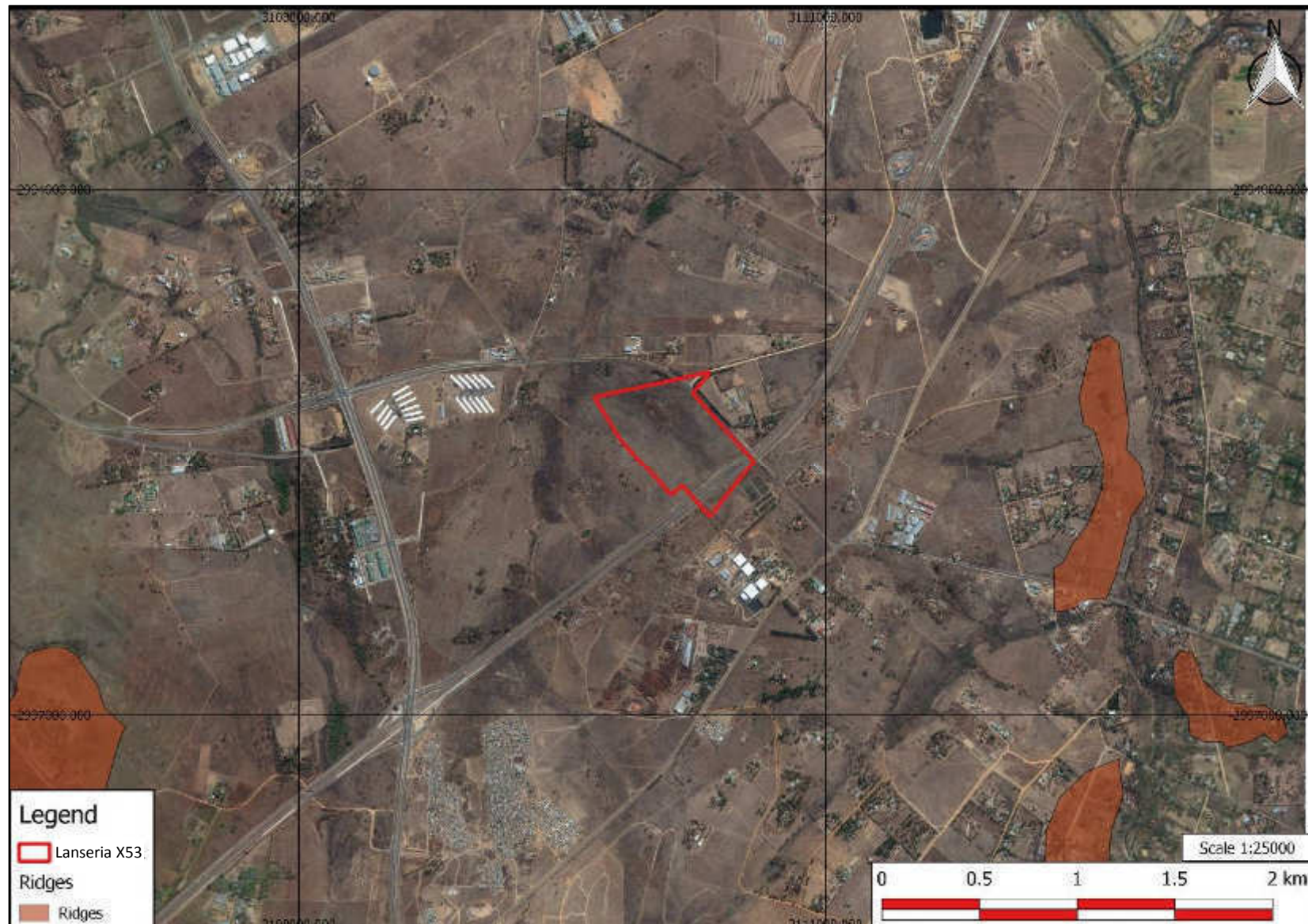
Projection – Transverse Mercator
Datum- Hartbeeshoek 1994
Reference Ellipsoid –WGS 1984
Central Meridian -29

Lanseria X53 Aerial Map



Lanseria X53

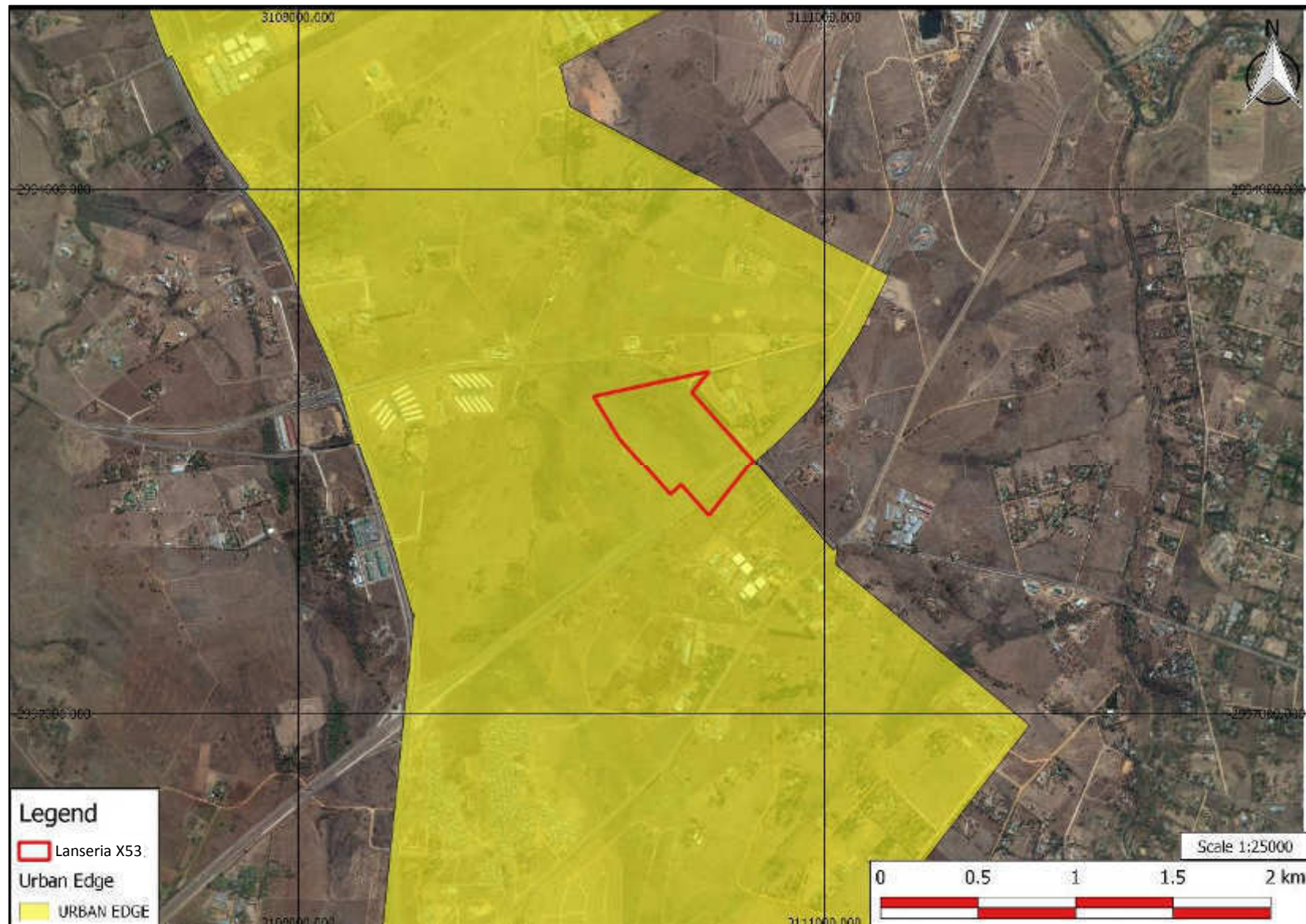
Ridges



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

Lanseria X53

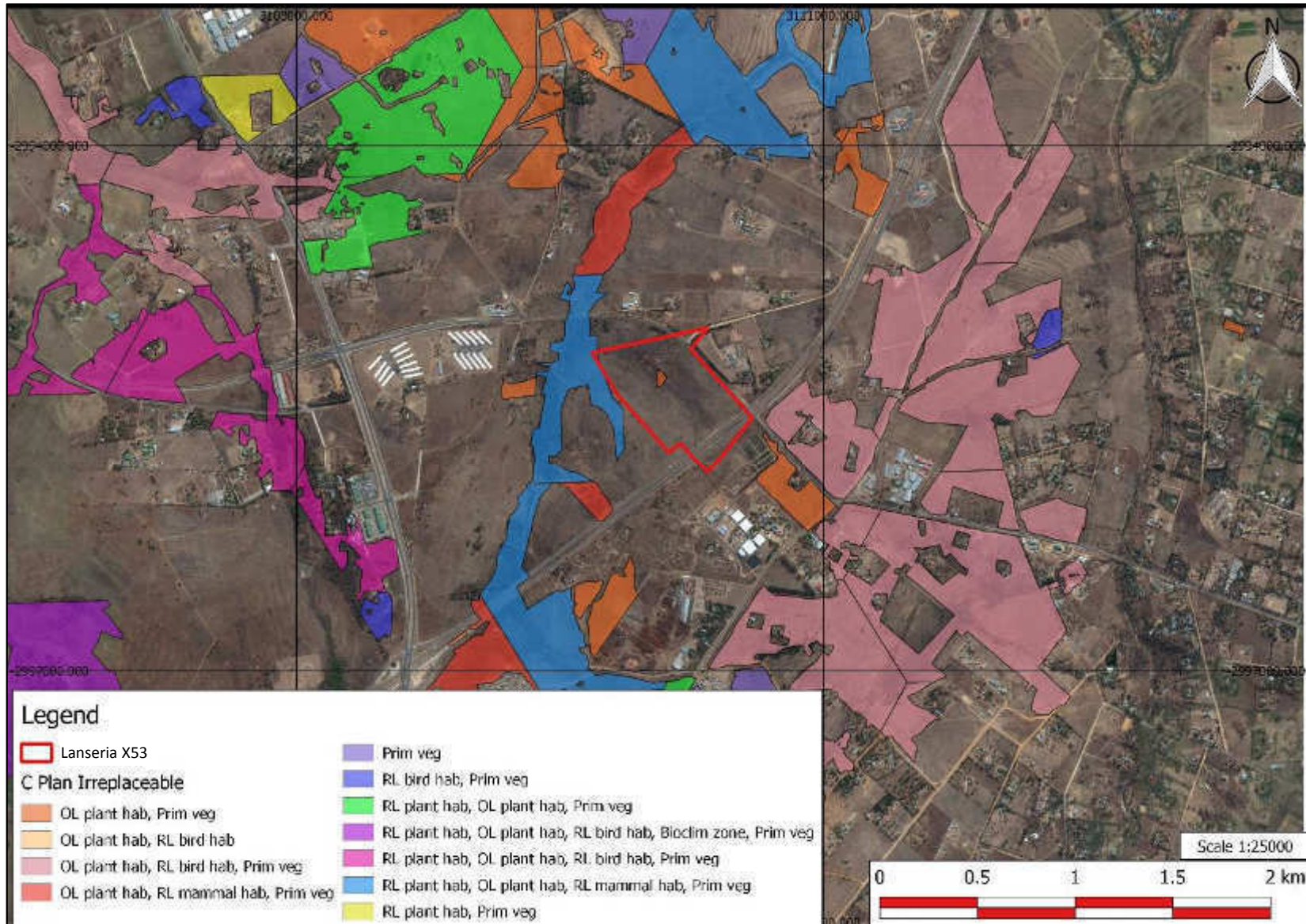
Urban Edge



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

Lanseria X53

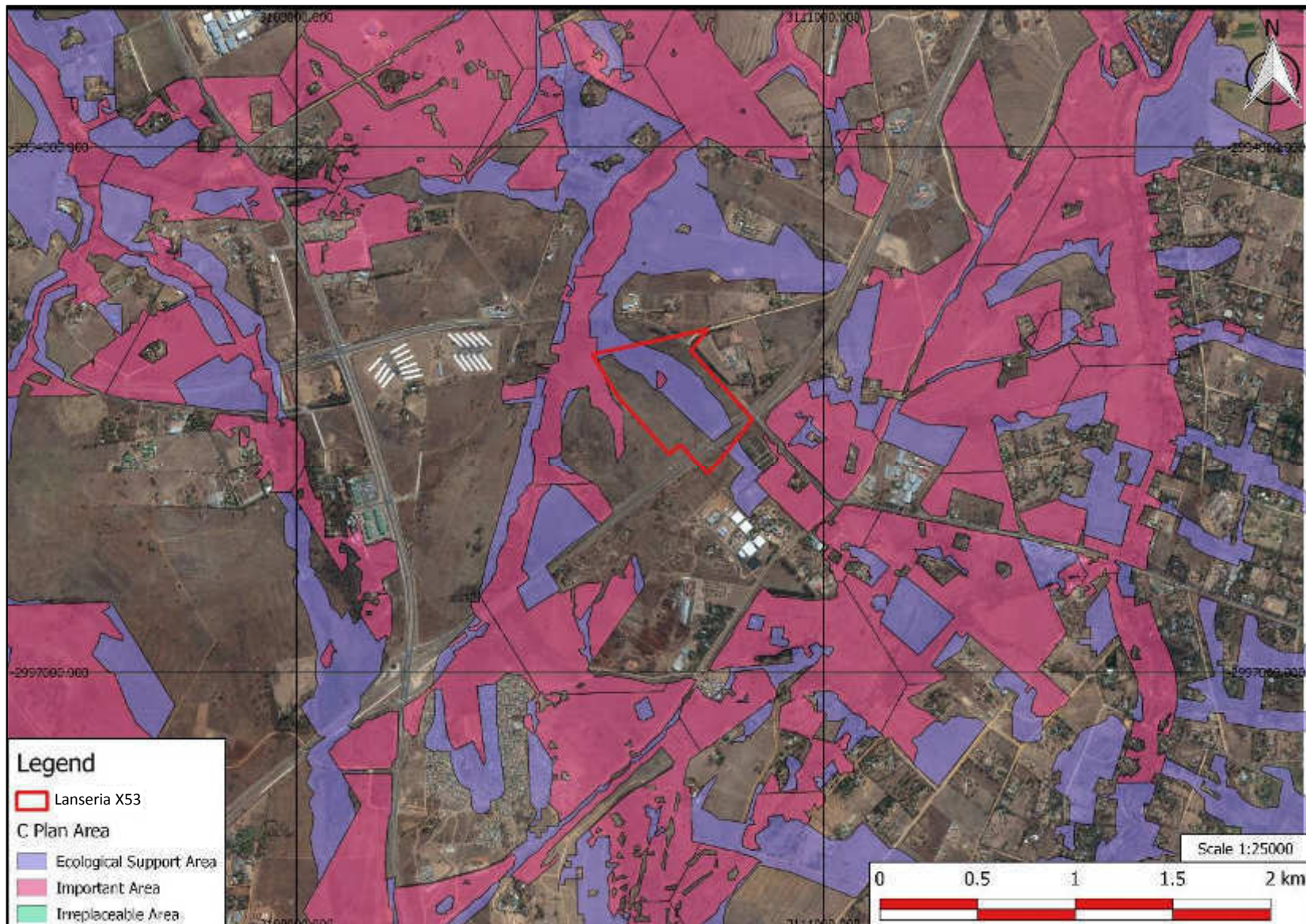
C Plan Irreplaceable



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

Lanseria X53

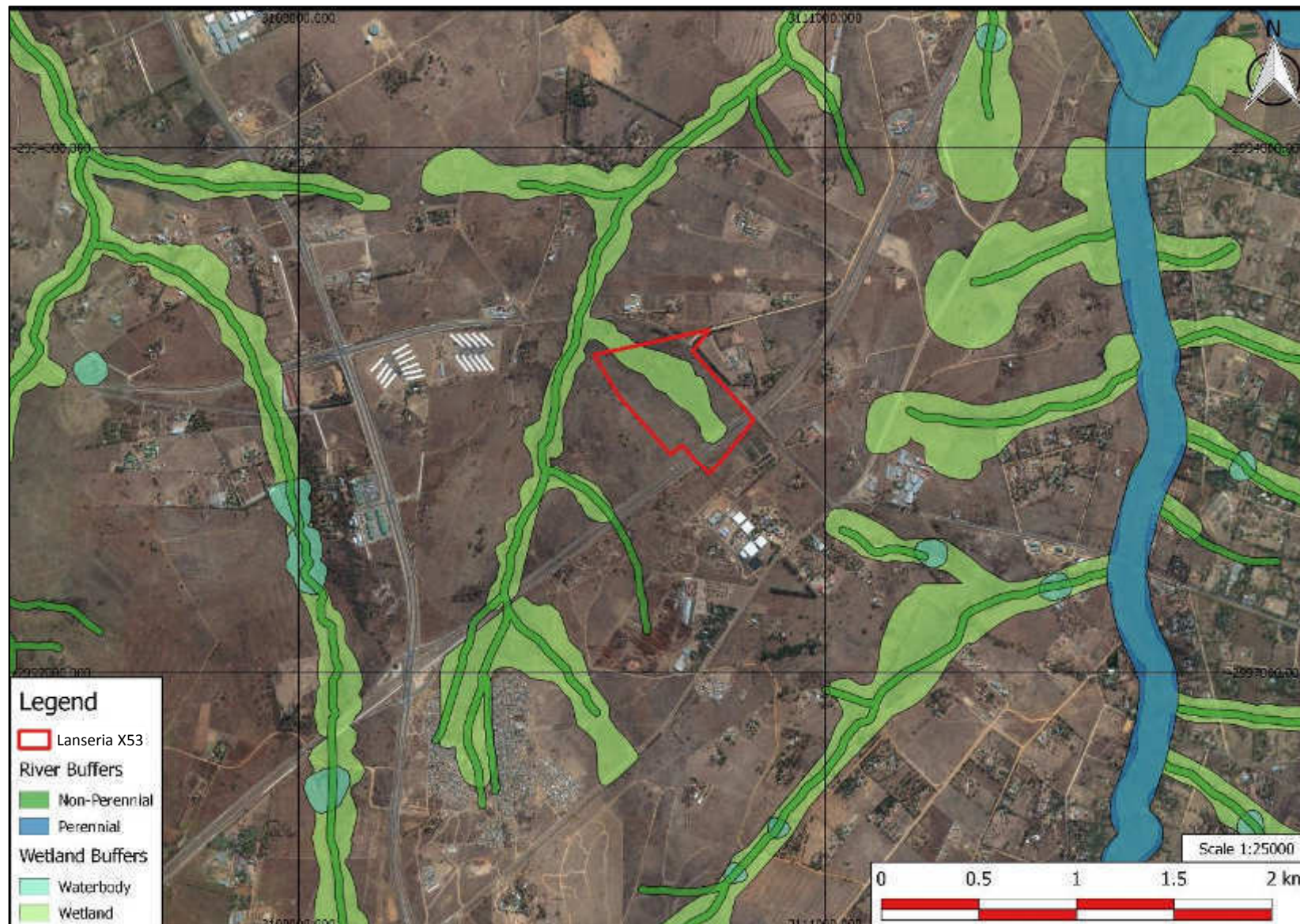
C Plan Area



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

Lanseria X53

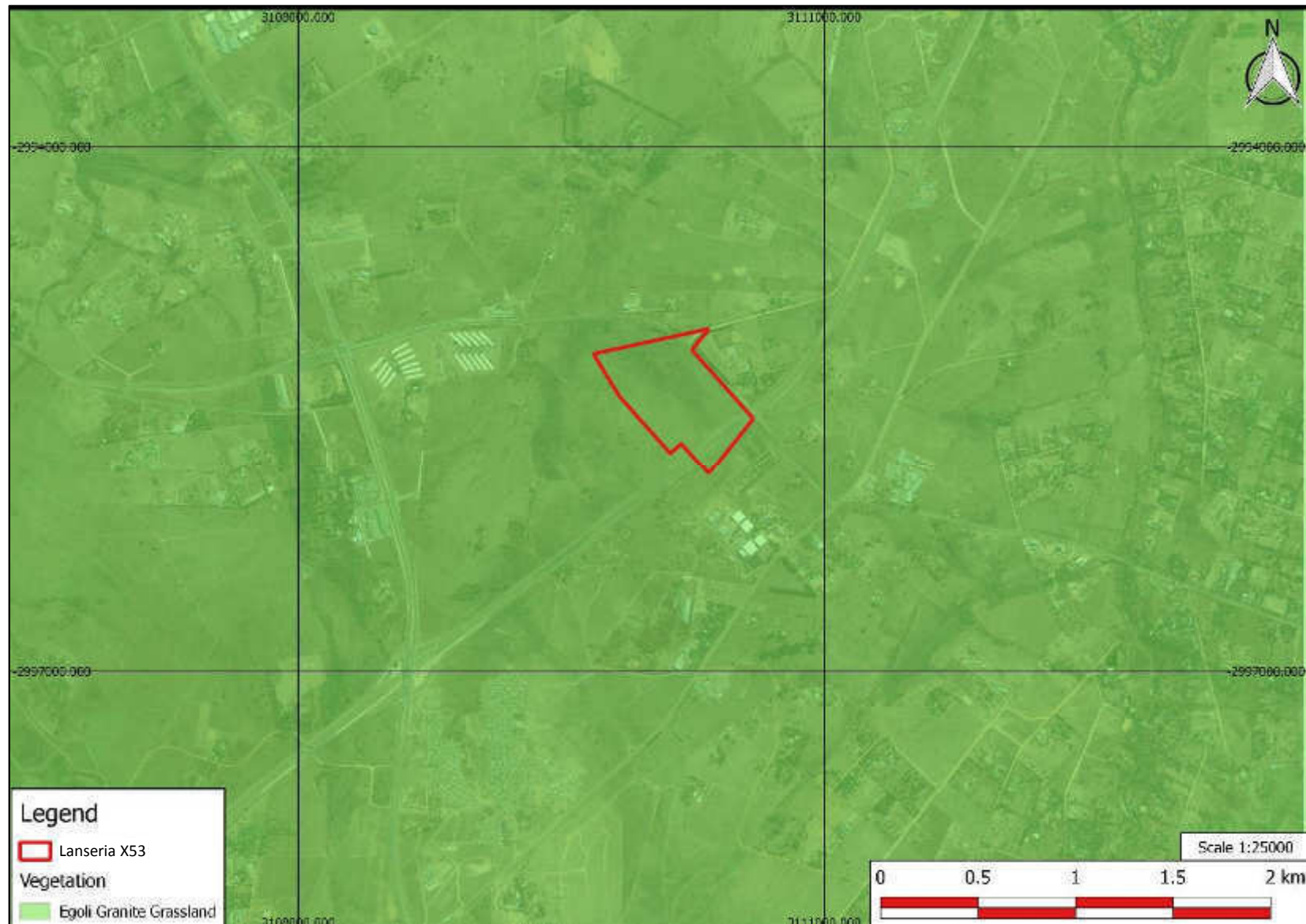
Rivers and Wetlands



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

Lanseria X53

Vegetation



Legend

Lanseria X53

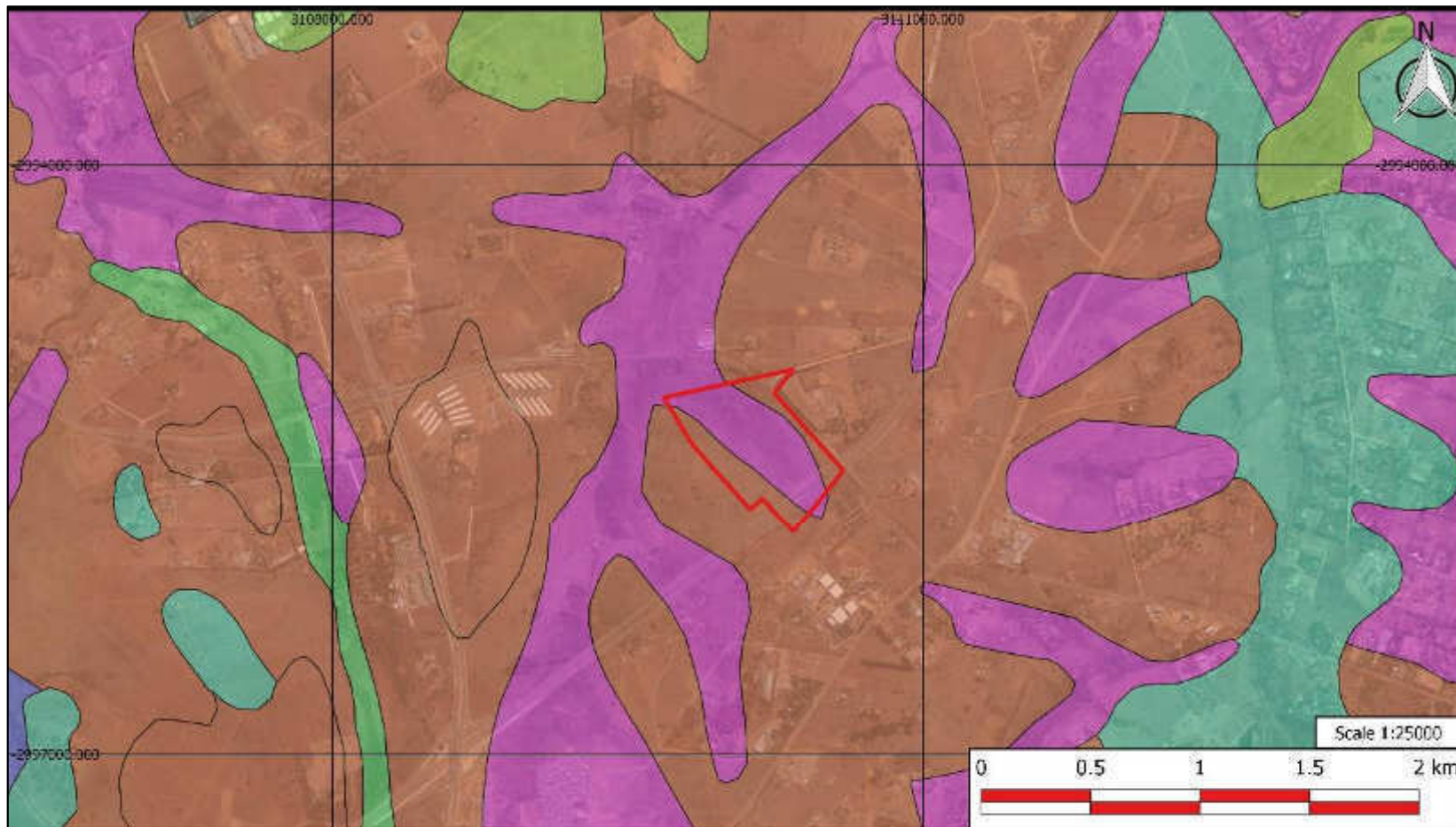
Vegetation

Egoli Granite Grassland

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

Lanseria X53

Soils



Legend

Lanseria X53

Soils

Disturbed sites

Impeded internal drainage, limiting soil depth

Impeded internal drainage, limiting soil depth, low clay content, difference in clay conte

Impeded internal drainage, low clay content

Limiting soil depth

Limiting soil depth, impeded internal drainage in subsoil

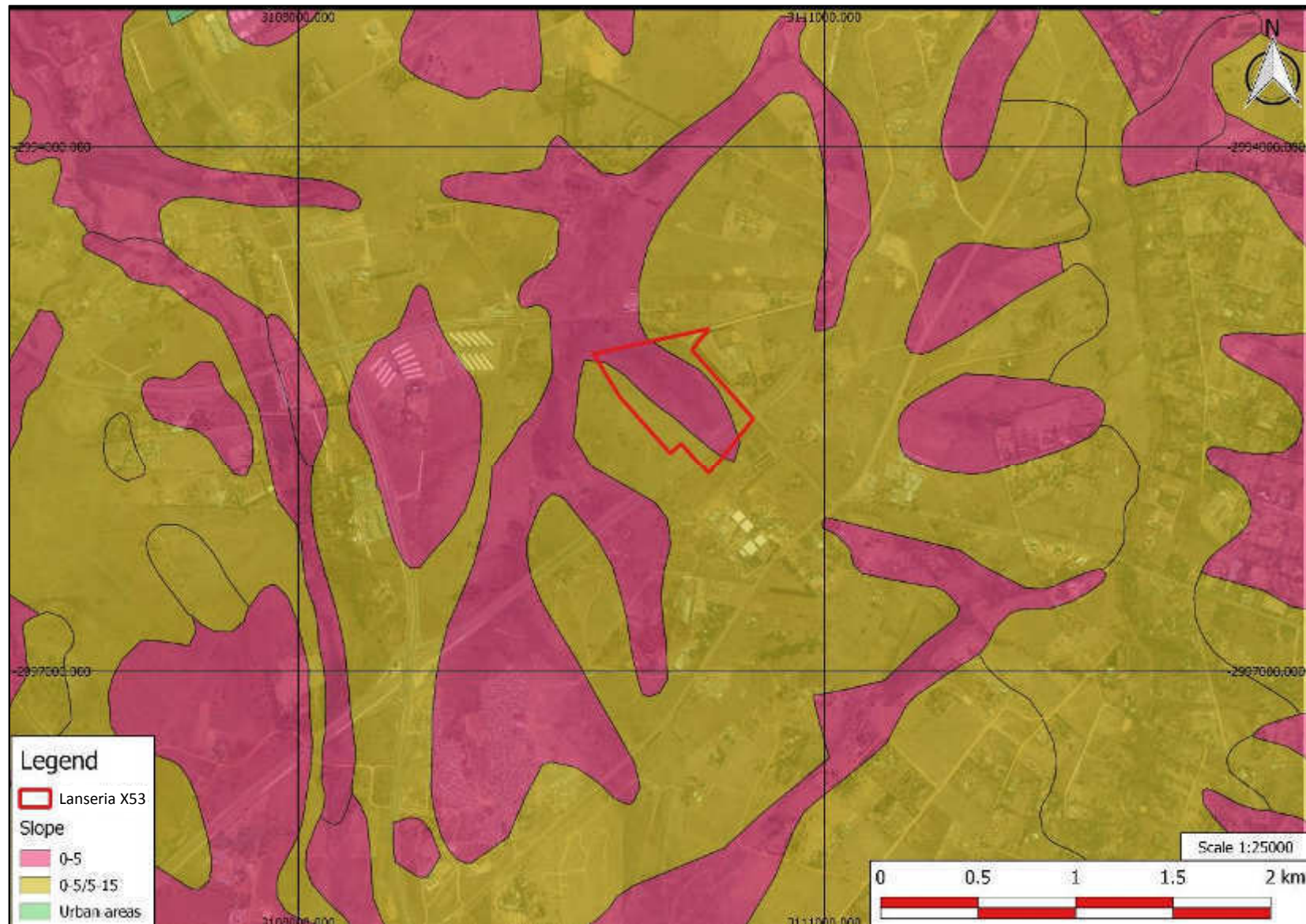
Limiting soil depth, rock outcrops

Rock outcrops, limiting soil depth

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

Lanseria X53

Slope



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

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

Lanseria X53 Biome



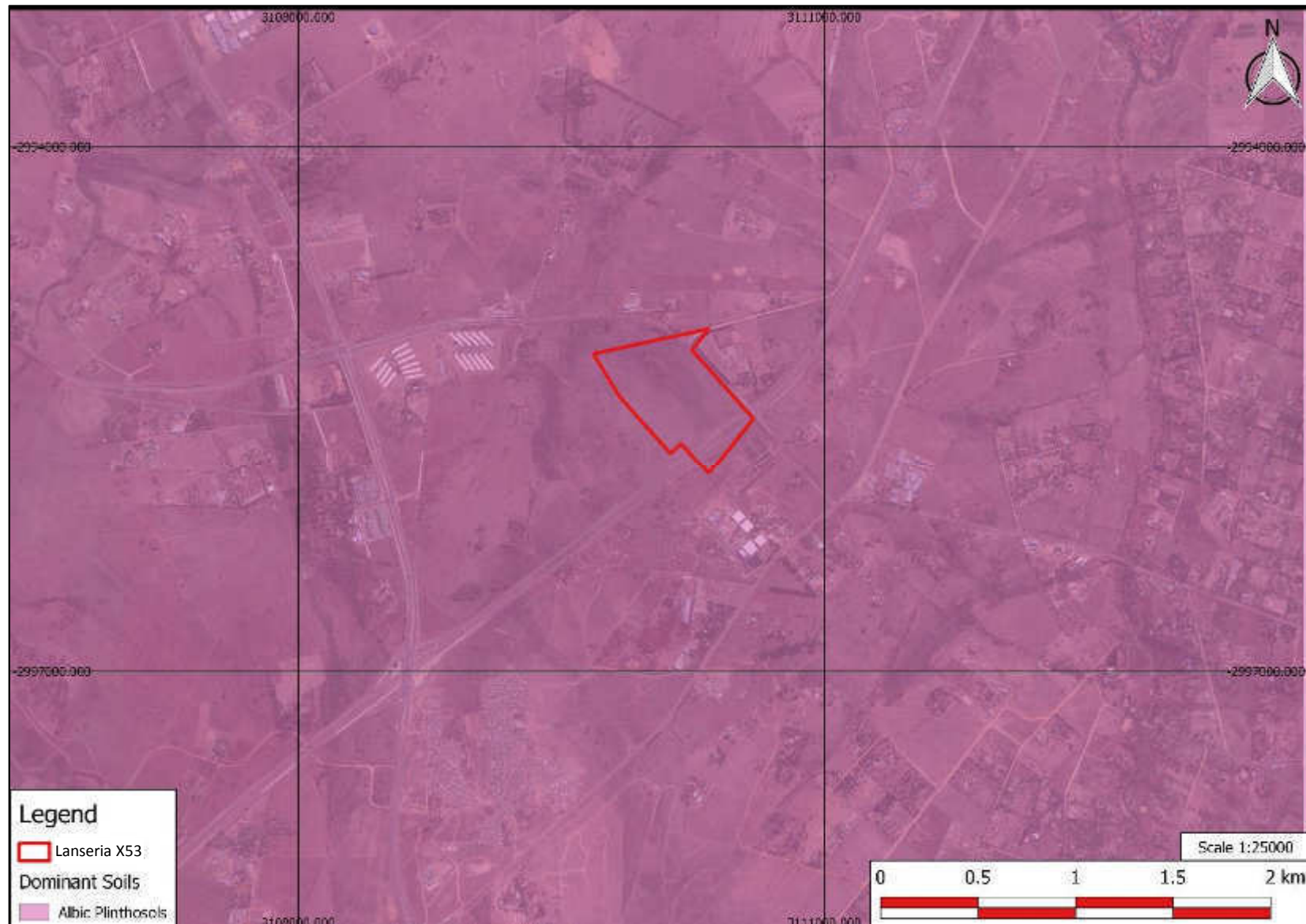
Legend

- Lanseria X53
- Grassland

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

Lanseria X53

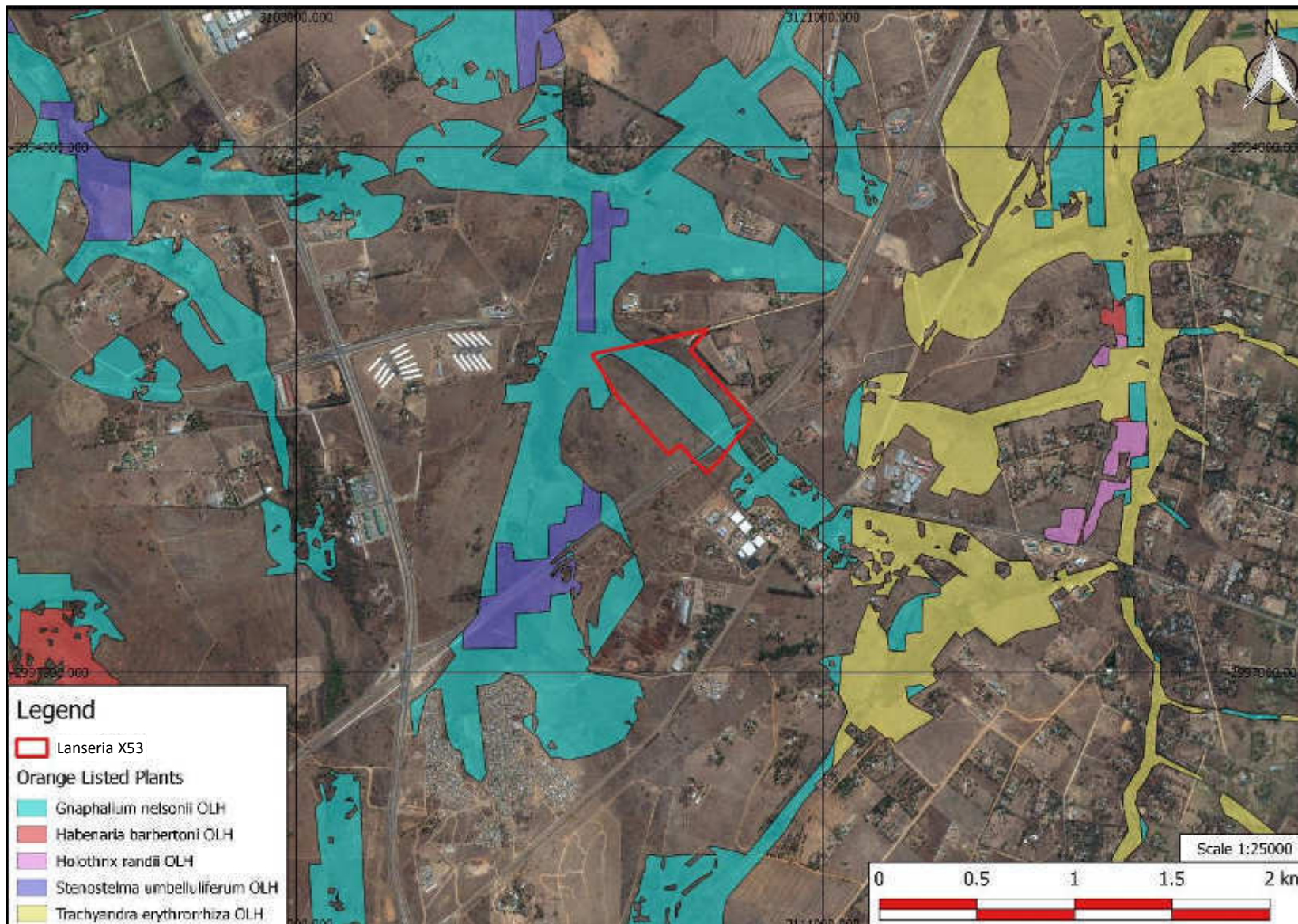
Dominant Soils



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

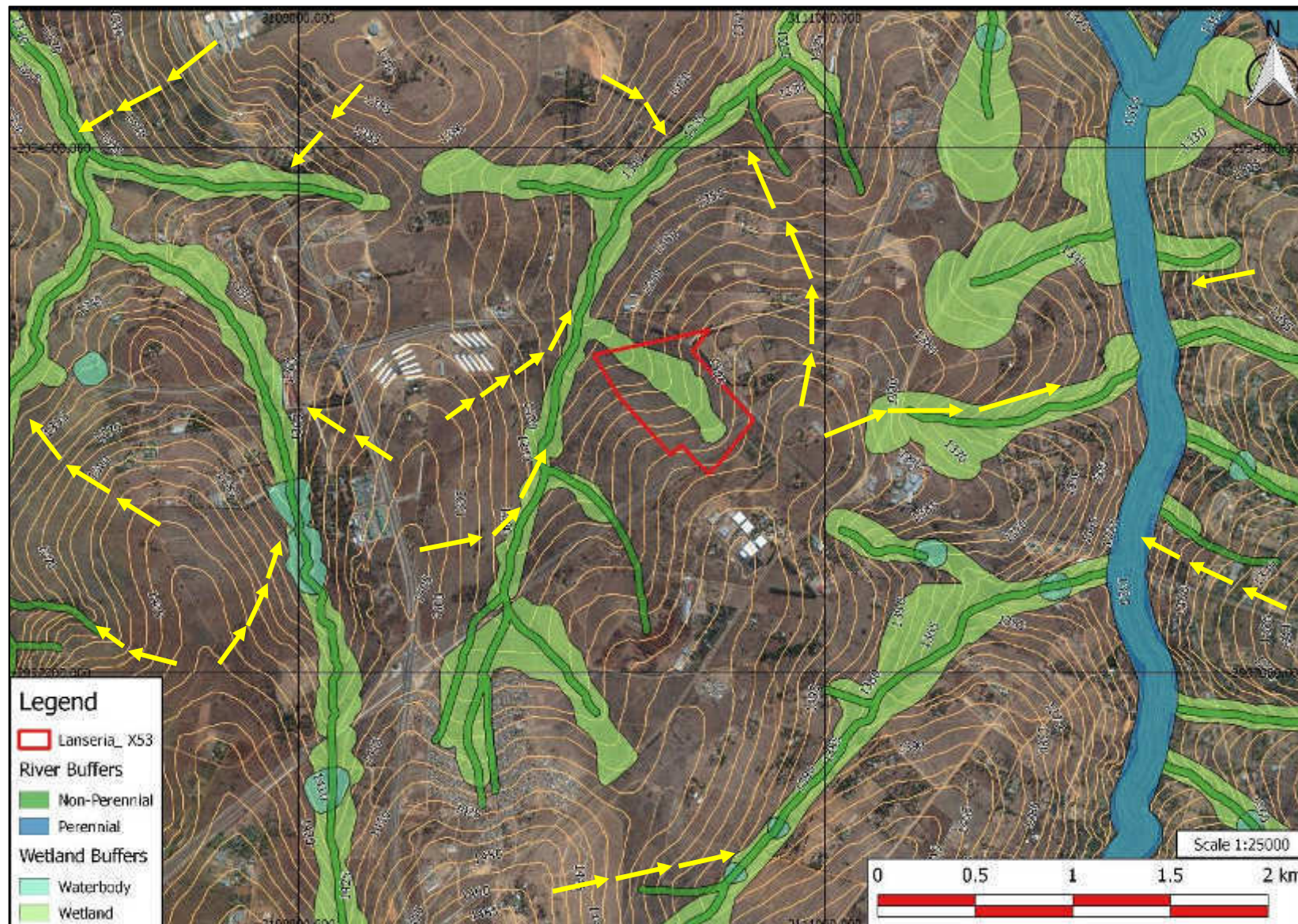
Lanseria X53

Orange Listed Plants



Lanseria X53

Hydrology



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

ANNEXURE B:

GDARD SCOPING APPROVAL



GAUTENG PROVINCE
AGRICULTURE AND RURAL DEVELOPMENT
REPUBLIC OF SOUTH AFRICA

Reference: Gaut 002/11-12/E0123
Enquiries: Caroline Sithi
Telephone: (011) 240 - 3394
Email: Caroline.Sithi@gauteng.gov.za

Bokamoso Landscape Architects and Environmental Consultants
P. O. Box 11375
Maroelana
0161

Attention: Lizelle Gregory
Fax No: 086 570 5659
Tel No: (012) 346 - 3810

PER FACSIMILE/REGISTERED MAIL

Dear Madam

SCOPING REPORT AND PLAN OF STUDY ACCEPTED: THE PROPOSED LANSERIA X 53 ON PORTION 73 AND THE REMAINING EXTENT OF PORTION 27 OF THE FARM NIETGEDACHT 535-JQ, CITY OF JOHANNESBURG METROPOLITAN MUNICIPALITY

The scoping report and plan of study for environmental impact assessment which was submitted in respect of the above-mentioned application and received by the Department on 20 May 2014 has been accepted. 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.

It should be noted that the Department requires the following to be undertaken and form part of the final EIR to be submitted:

1. All the activities to be undertaken on site must be described, and the impacts that they will have on the physical, biological, social, economic and cultural aspects of the environment must be assessed.
2. Feasible and reasonable alternatives based on the different types/categories of alternatives must be identified and assessed, so that the Department can be able to make an informed decision.
3. All comments from interested and affected parties must be addressed in the final Environmental Impact Report (EIR) including comments received from the City of Johannesburg Metropolitan Municipality dated 30 July 2012, and those received from the Department of Water Affairs dated 08 August 2012.
4. A full public participation process must be conducted. It is noted that a newspaper advert was published on the Beeld; hence it is advisable that an advert be placed in both the Local and National newspapers in order to accommodate other participants who may have interest in registering as interested and affected parties, more especially those who don't read an Afrikaans Newspaper.
5. Section 5.1.2 of the plan of study lists the City of Tshwane as the relevant authority, please note that City of Johannesburg is the relevant authority and consultation process must include them.

6. For linear activities such as roads and pipelines, a description of the co-ordinates of the corridor in which the proposed activities are to be undertaken. The impacts of these linear activities must be thoroughly assessed.
7. A motivation for the need and desirability of the project must be included.
8. Pages 16 and 20 on the preliminary Environmental Issues table under the issue of 'Agriculture', it is stated that the land is earmarked for agricultural uses. Although it is noted that the site does not fall within the seven (7) agricultural hubs as identified for Gauteng, it is advised that an Agricultural Potential Study be conducted for the proposed site.
9. A services report must be included as part of the Environmental Impact Report. The capacity of the infrastructure to cater for the proposed development must be confirmed with the relevant municipality (both water and sewer).
10. The proposed activities are located on a site that is identified as Ecological Support Area in terms of the Gauteng C-Plan Version 3.3. The sensitivities identified include but are not limited to the site being an Orange listed plant habitat, a threatened ecosystem with a rating of being endangered consisting of Egoli Granite Grassland. The site is also bisected by a wetland. The following is required:

A Biodiversity Assessment which complies with the Minimum Requirements for Biodiversity Studies, i.e.

Vegetation

- Vegetation surveys must be undertaken by suitably qualified specialists registered as Professional Natural Scientists in accordance with the Natural Scientific Professions Act (No. 27 of 2003) within the field of Botanical Science. Specialists must have qualifications and experience relevant to vegetation science/ecology.
- Surveys must take place during the summer season (beginning of November to the end of April).
- Scientifically credible methods must be employed and a reference provided.
- The location and extent of all plant communities on the study site must be mapped and a description provided for each. The area (in hectares) and ecological sensitivity of each plant community must be indicated.
- All good condition natural vegetation must be designated as ecologically sensitive. The location and extent of all primary grassland (even if it is in a poor/degraded condition) must be mapped and designated as ecologically sensitive.
- A plant species list must be provided for each plant community with medicinal and invasive/exotic species indicated. The number of forb/herb, grass, shrub and tree species must be indicated for each plant community.
- A general Red List plant survey must be undertaken. Lists of potential species can be obtained from Lorraine Mills (Lorraine.Mills@gauteng.gov.za/GDARD_BiodiversityInfo@gauteng.gov.za).
- Surveys must determine whether any of the following tree species are present on site: *Acacia erioloba*, *Boscia albitrunca*, *Combretum imberbe*, *Pittosporum viridiflorum*, *Prunus africana*, *Sclerocarya birrea subsp. caffra*.
- Ecologically sensitive areas on adjacent properties, within a minimum distance of 200m of the study site, must be identified.
- **Results must be incorporated into a sensitivity map in accordance with the sensitivity mapping rules for vegetation.**

Birds

Due to the proximity of the Priority Red Listed Bird (confirmed habitat) it is advised that a specialist study on birds be conducted. Specialists undertaking ornithological studies must be registered as Professional Natural Scientists in accordance with the Natural Scientific Professions Act (No. 27 of 2003) within the field of Zoology must be able to demonstrate relevant work

experience and must have published on relevant aspects of the biology and/or ecology of birds. The individual must also have recognized expertise pertaining to the species targeted in the survey.

As a general rule, specialist assessments must be conducted in a manner and at a scale that is appropriate to the species in question. An ecosystem/regional approach is required for the effective conservation of most bird species and their habitat and as such, specialist ornithological assessments must not be constrained by the extent of the application site. Instead, assessments must incorporate suitable habitat around the proposed development site (whether contiguous or fragmented) to a distance that is appropriate to the spatial requirements and movement patterns of the species in question. Such distances will vary from species to species and from one habitat type to another. The onus for ensuring that specialist ornithological assessments are conducted at the appropriate scale rests with the Specialist Ornithological Consultant (SOC), though guidelines can be obtained from the GDARD ornithologist (Craig.Whittington-Jones@gauteng.gov.za).

- The SOC must determine whether the proposed development site falls within the known or expected distribution of any of the following Red List bird species prioritized by GDARD:- Cape Vulture, Blue Crane, Lesser Kestrel, African Grass-Owl, African Marsh-Harrier, White-backed Night-Heron, White-bellied Korhaan, Martial Eagle, African Finfoot, Lesser Flamingo, Secretarybird, Black Stork, Half-collared Kingfisher and Greater Flamingo.
- The SOC must determine whether suitable habitat occurs on the proposed development site or neighbouring properties for those priority Red List species whose distribution overlaps with the proposed development site.
- Surveys for terrestrial birds must be conducted in summer, but only once the vegetation layer has recovered sufficiently from winter fires to allow for assessment of available habitat.
- Surveys for aquatic birds must be conducted in summer. For species associated with rivers, the assessment must coincide with average flow conditions (i.e. not dry and not in flood) and preferably within the breeding season. For species associated with wetlands, the assessment must follow good summer rains i.e. standing water must be present and the vegetation must have recovered sufficiently from winter fires to allow for assessment of available habitat.
- Where distribution and habitat availability suggest a high probability of one or more priority Red List bird species occurring on site, the SOC must map suitable habitat (see Sensitivity Mapping rules for Biodiversity Assessments (spatial rules for birds) and indicate the number of individuals/pairs that could potentially be supported, given that it is unlikely that all birds will be located during a limited survey.

The SOC's report must include, but is not limited to, the following information:

- A map showing the location of the proposed development site and the area that was covered by the survey.
- The date and hours spent on site.
- An assessment of the availability of suitable habitat (breeding, foraging, roosting etc.) on site and within an appropriate distance around the site (this distance must be motivated in terms of the spatial requirements of the priority Red List species included in the assessment).
- A sensitivity map complying with the Sensitivity Mapping rules for Biodiversity Assessments (spatial rules for birds).
- GPS coordinates (recorded in decimal degrees in WGS84 datum) for all confirmed sightings of Red List species.
- The size and location of buffers must be motivated in terms of the latest research and publications. All references must be listed at the end of the report.
- Where mitigation measures are appropriate, these must be detailed together with the relevant problem statement.
- A comprehensive, site-specific ecological management plan for all proposed open spaces, buffers and corridors that are relevant to the species and/or habitats under investigation.

A full ornithological assessment, as specified above, is not required where the proposed activity will involve the construction of a communication mast / cell phone tower / overhead line (powerline or telephone line). Instead, an assessment of the increased risk of mortality or injury to birds is required. Such an assessment must be conducted by a suitably qualified expert with demonstrable experience in working with infrastructure-related bird collisions. The expert must advise on appropriate mitigatory measures, especially where these activities are to take place within/adjacent to urban open space systems or within rural areas.

If a Lesser Kestrel roost is present within 100m of a proposed development, the role of the SOC is to identify and mitigate potential sources of disturbance for roosting birds and to develop a suite of appropriate management measures (given that roosting birds are known to foul areas below the roost with regurgitated pellets and faeces) that will promote the harmonious co-existence of these birds and humans.

Where Martial Eagles or Secretarybirds have been confirmed for an area or where the SOC believes that ideal habitat is present on a site, the specialist ornithological assessment must include a search for potential nest sites using aerial photos (e.g. Quickbird) and ground verification within the surrounding 14km for Martial Eagles or 9km for Secretarybirds. If nests are confirmed within this area, then the SOC must provide mitigation measures and offsets to ensure that development does not compromise the persistence of a pair in that territory.

Wetlands

- All specialist studies must be undertaken by suitably qualified specialists who (1) are registered in accordance with the Natural Scientific Professions Act (2003) as Professional Natural Scientists within the field of Ecological or Aquatic Science (2) have specific post-graduate qualifications relating to wetlands. In the absence of the latter, the specialist must have attended an appropriate course on wetland rehabilitation and delineation (copy of certificate must be provided).
- The wetland delineation procedure must identify the outer edge of the temporary zone of the wetland, which marks the boundary between the wetland and adjacent terrestrial areas and is that part of the wetland that remains flooded or saturated close to the soil surface for only a few weeks in the year, but long enough to develop anaerobic conditions and determine the nature of the plants growing in the soil.
- Delineation must be undertaken according to "DWAF, 2003: A practical Guideline Procedure for the Identification and Delineation of Wetlands and Riparian Zones".
- Locating the outer edge of the temporary zone must make use of four specific indicators including the terrain unit indicator, the soil form indicator, the soil wetness indicator and the vegetative indicator.
- The wetland and a protective buffer zone, beginning from the outer edge of the wetland temporary zone, must be designated as sensitive in a sensitivity map (refer to *Sensitivity Mapping rules for Biodiversity Assessments*).

The catchment of all pan wetlands must be demarcated. Please note that GDARD's sensitivity project is an internal one and that a shapefile of these pans may be requested from (Albertina.Setsiba@gauteng.gov.za /GDACE_BiodiversityInfo@gauteng.gov.za).

The report must include the following information (but not restricted to):

- The present ecological state of the wetland.
- The impacts which are likely to occur due to the proposed development, and recommendations to avoid or minimize such impacts.
- If the wetland is degraded, a rehabilitation plan must be included (all wetlands must be conserved and rehabilitated if necessary; their destruction for development purposes will not be supported).
- The delineation procedure that has been applied.

- Conservation worthy/valuable biota identified in the wetland or surrounding areas.
- Sensitivity map showing the outer edge of the temporary wetland and the buffer in relation to the proposed development.
- A plan indicating how the stormwater that will be generated by the proposed development will be managed.

NB: A shapefile (see Appendix 1 for shapefile requirements) of the delineated wetland must be e-mailed to (Albertina.Setsiba@gauteng.gov.za/GDACE_BiodiversityInfo@gauteng.gov.za) for GDARD's records.

All wetland habitats must be surveyed for the following mammal species: *Chrysospalax villosus*, *Myodomys albicaudatus*, *Lutra maculicollis*, *Amblysomus septentrionalis*, *Dasymys incomtus*. Minimum requirements for mammal studies apply.

The edge of the wetland must be clearly demarcated in the field with pegs or poles that will last for the duration of the construction phase, colour-coded as follows:

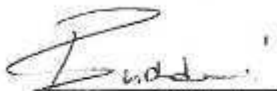
- RED – Indicating the edge of the wetland (Note: This includes the permanent, seasonal and temporal wetlands, or parts thereof; and no vehicles or building materials are allowed in this zone) [These should be put along the entire length of the property/site.],
- ORANGE – Indicating the edge of the buffer zone (30m within urban areas and 50m outside urban areas). However, allowance must be made for sensitive species that require larger areas, e.g. Grass Owl, Giant Bullfrog, etc.

11. All other studies as indicated in the scoping report and plan of study must be conducted.
12. Layout plan with sensitivity map overlay is required. The map must show all the listed activities applied for.
13. A site specific Environmental Management Programme (EMPr) must be compiled and attached to the final EIR.

Notwithstanding the above, your attention is drawn to the fact that the success of the application may be prejudiced by the lack of relevant information as requested above.

If you have any queries regarding the contents of this letter, please contact the official of the Department at the number indicated above.

Yours faithfully



Ms. Basani Ndindani

Director – Environmental Planning and Impact Assessment

Date: 09/02/2013

CC: City of Johannesburg Metropolitan Municipality

Attn: Ms N Maduse
Tel: (011) 407 6520
Fax: 086 627 7516

Extension 24 Commercial Leasing Co (Pty) Ltd

Attn: Mr. Chris Harris
Tel: (011) 803 9233
Fax: (011) 803 9550

EPIA (SWR :JHB)

Fax: 086 581 0363



GAUTENG PROVINCE
AGRICULTURE AND RURAL DEVELOPMENT
REPUBLIC OF SOUTH AFRICA

FAX COVER

TO:	FROM:
Lizelle Gregory	Caroline Sithi.
COMPANY:	DATE:
Bokamoso Landscape Architects and Environmental Consultants	
FAX NUMBER	TOTAL NO. OF PAGES, INCLUDING COVER:
086 570 5659	06
PHONE NUMBER:	TEL:
(012) 346 - 3810	(011) 240 - 3394
RE:	YOUR REFERENCE NUMBER:
SCOPING REPORT AND PLAN OF STUDY ACCEPTED: THE PROPOSED LANSERIA X 53 ON PORTION 73 AND THE REMAINING EXTENT OF PORTION 27 OF THE FARM NIETGEDACHT 535-JQ, CITY OF JOHANNESBURG METROPOLITAN MUNICIPALITY	Gaut 002/11-12/E0123

CC: City of Johannesburg Metropolitan Municipality

Attn: Ms N Maduse
 Tel: (011) 407 6520
 Fax: 086 627 7516

Extension 24 Commercial Leasing Co (Pty) Ltd

Attn: Mr. Chris Harris
 Tel: (011) 803 - 9233
 Fax: (011) 803 - 9550

EPIA (SWR -JHB)

Fax: 086 581 0363

☐ URGENT ☐ FOR REVIEW ☐ PLEASE COMMENT ☐ PLEASE REPLY ☐ PLEASE RECYCLE

ANNEXURE C:
CV OF EAP AND COMPANY
PROFILE

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.



**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 compromises 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



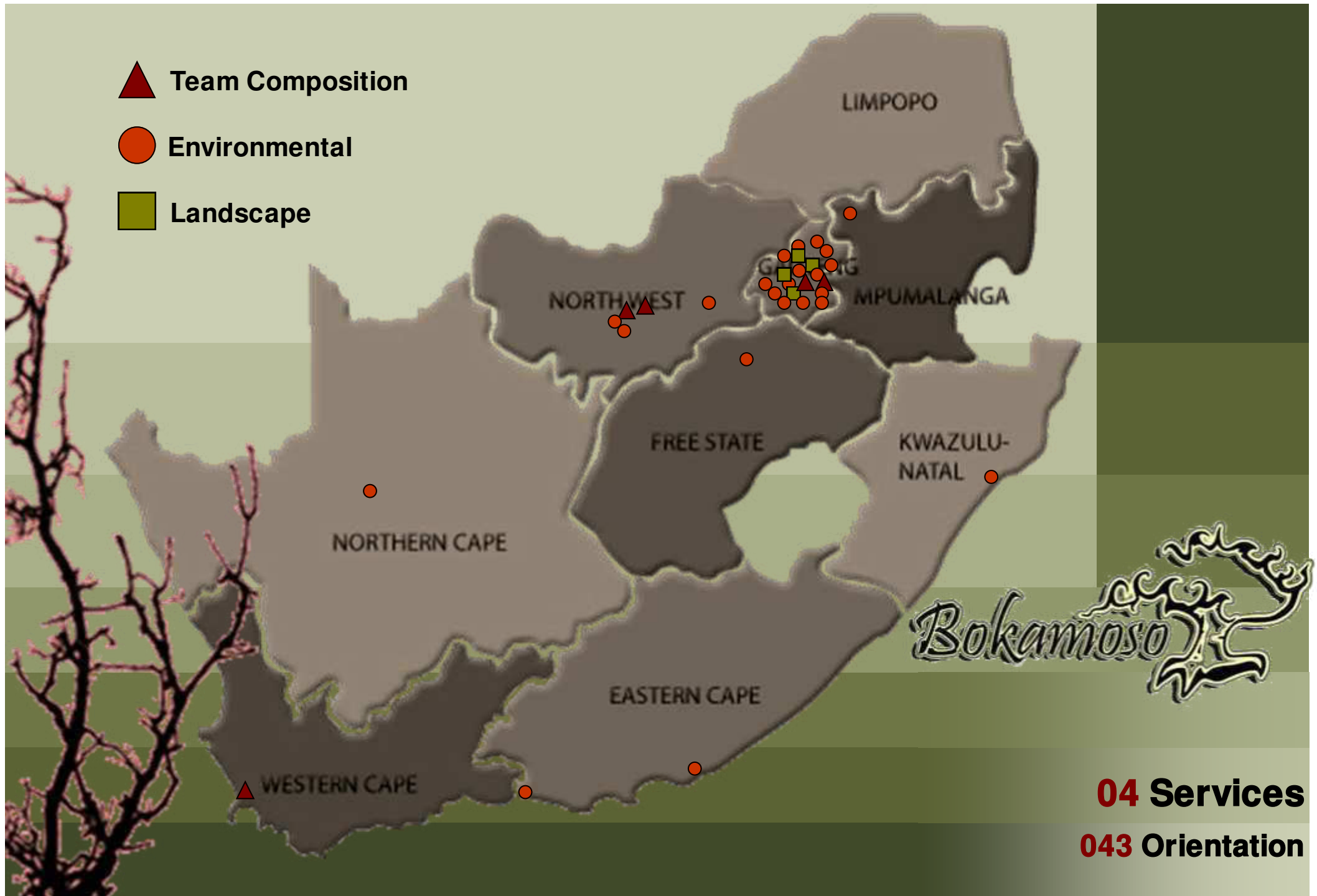
04 Services

042 Contracting Services

▲ Team Composition

● Environmental

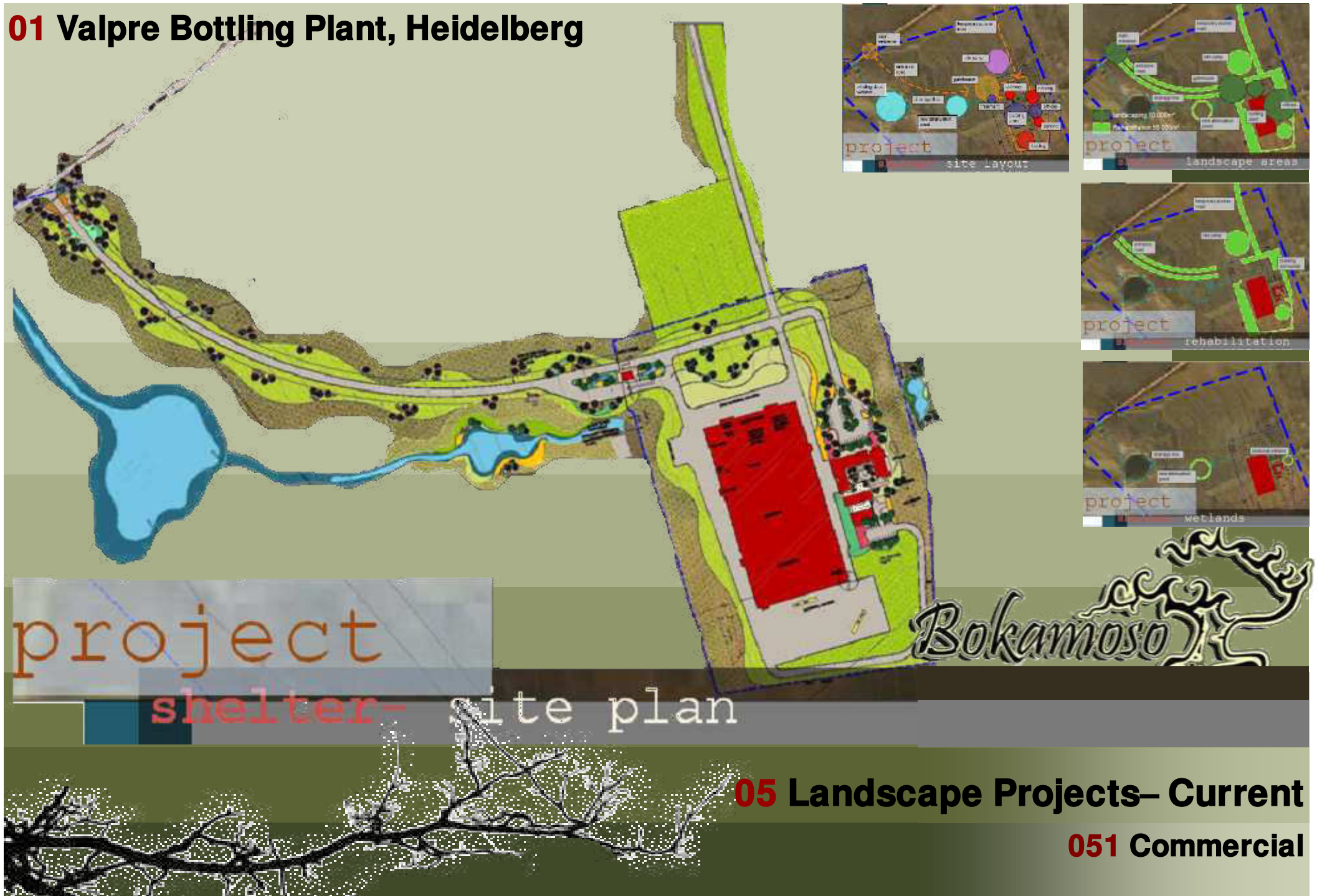
■ Landscape



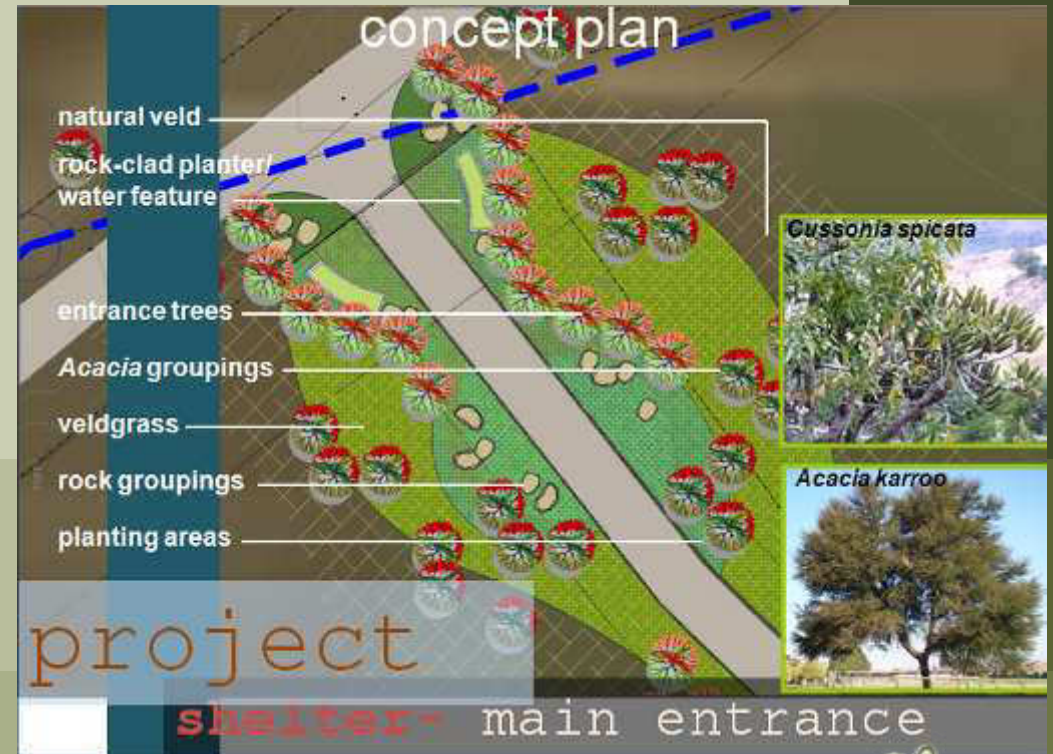
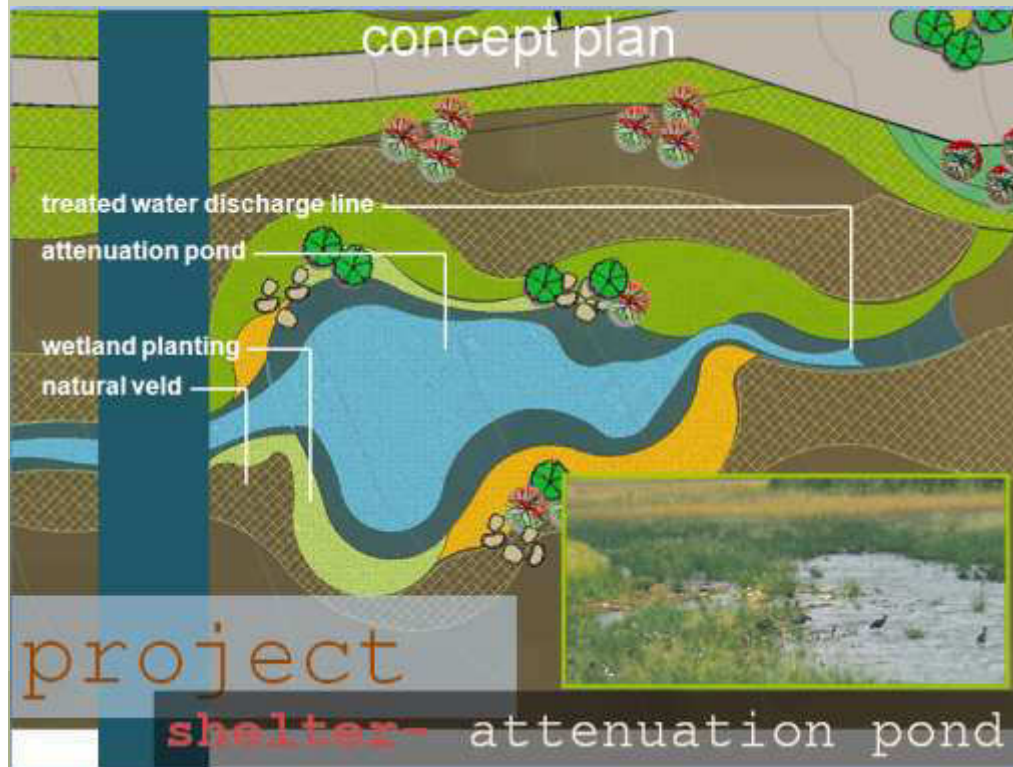
04 Services

043 Orientation

01 Valpre Bottling Plant, Heidelberg



01 Valpre Bottling Plant, Heidelberg

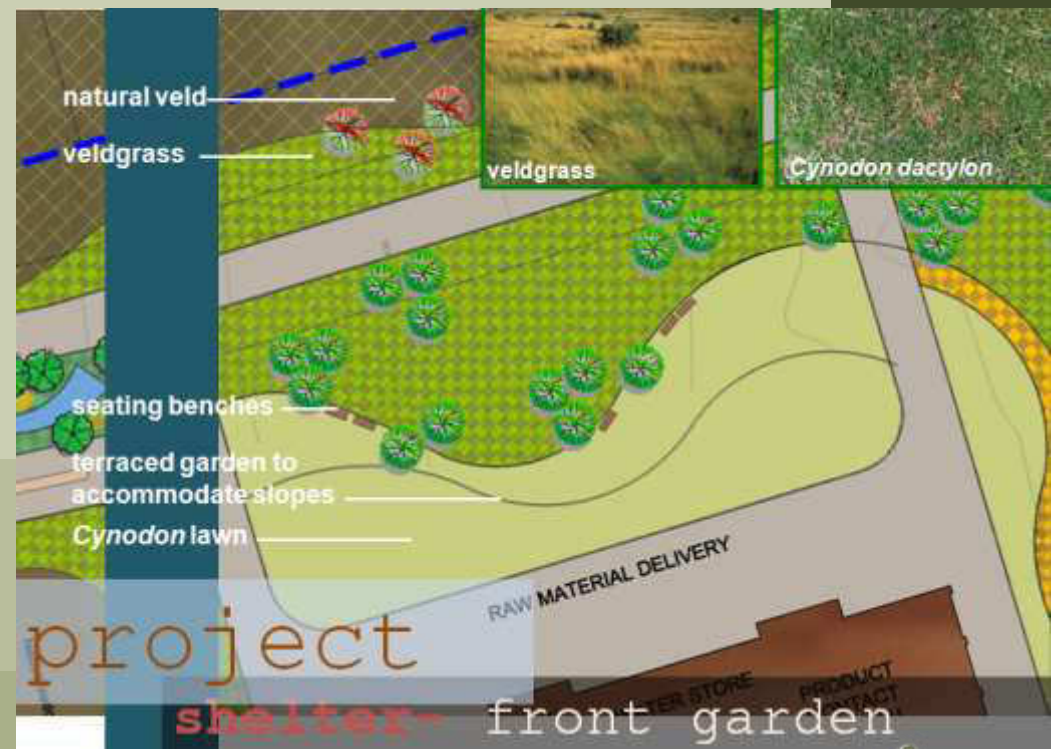


Bokamoso

05 Landscape Projects– Current

051 Commercial

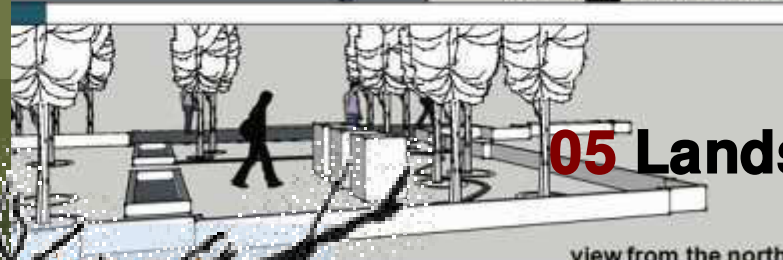
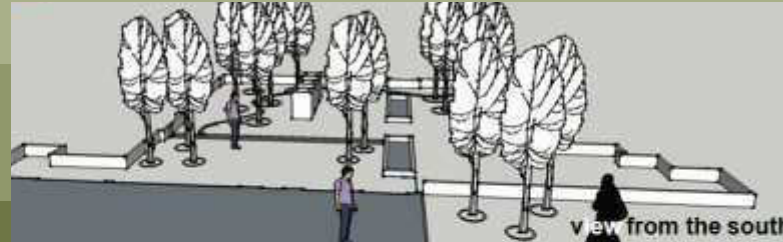
01 Valpre Bottling Plant, Heidelberg



05 Landscape Projects– Current

051 Commercial

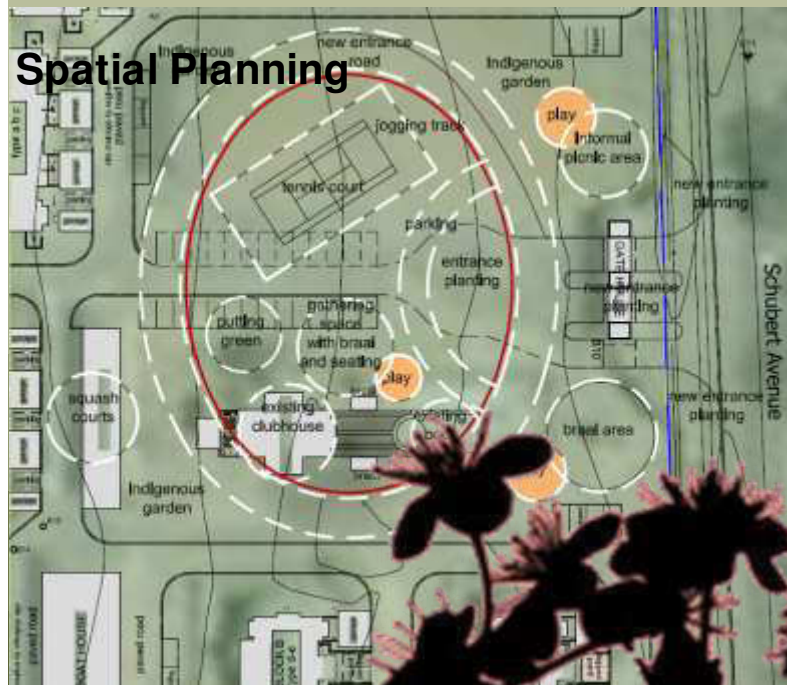
01 Valpre Bottling Plant, Heidelberg



05 Landscape Projects– Current

051 Commercial

02 Melodie Waters, Hartebeespoortedam



Indigenous Planting

Streetscape



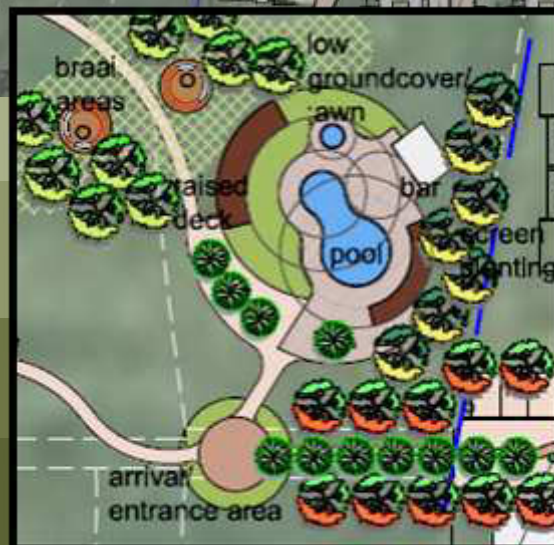
05 Landscape Projects – Current

052 Commercial/Recreational

02 Melodie waters, Hartebeestpoortdam



Rehabilitation



Area Layout



05 Landscape Projects– Current

052 Commercial/Recreational

03 Grain Building, Pretoria



Bokamoso

05 Landscape Projects– Completed

053 Offices

04 Ismail Dawson offices, Pretoria



Bokamoso

05 Landscape Projects – Conceptual

053 Offices

05 Celtic Manor, Pretoria



Bokamoso

05 Landscape Projects - Completed

054 Complex Development

Natural Vegetation

Boundary

Brick Kerb

Kikuyu

06 The Wilds, Pretoria



05 Landscape Projects – Completed

054 Complex Development

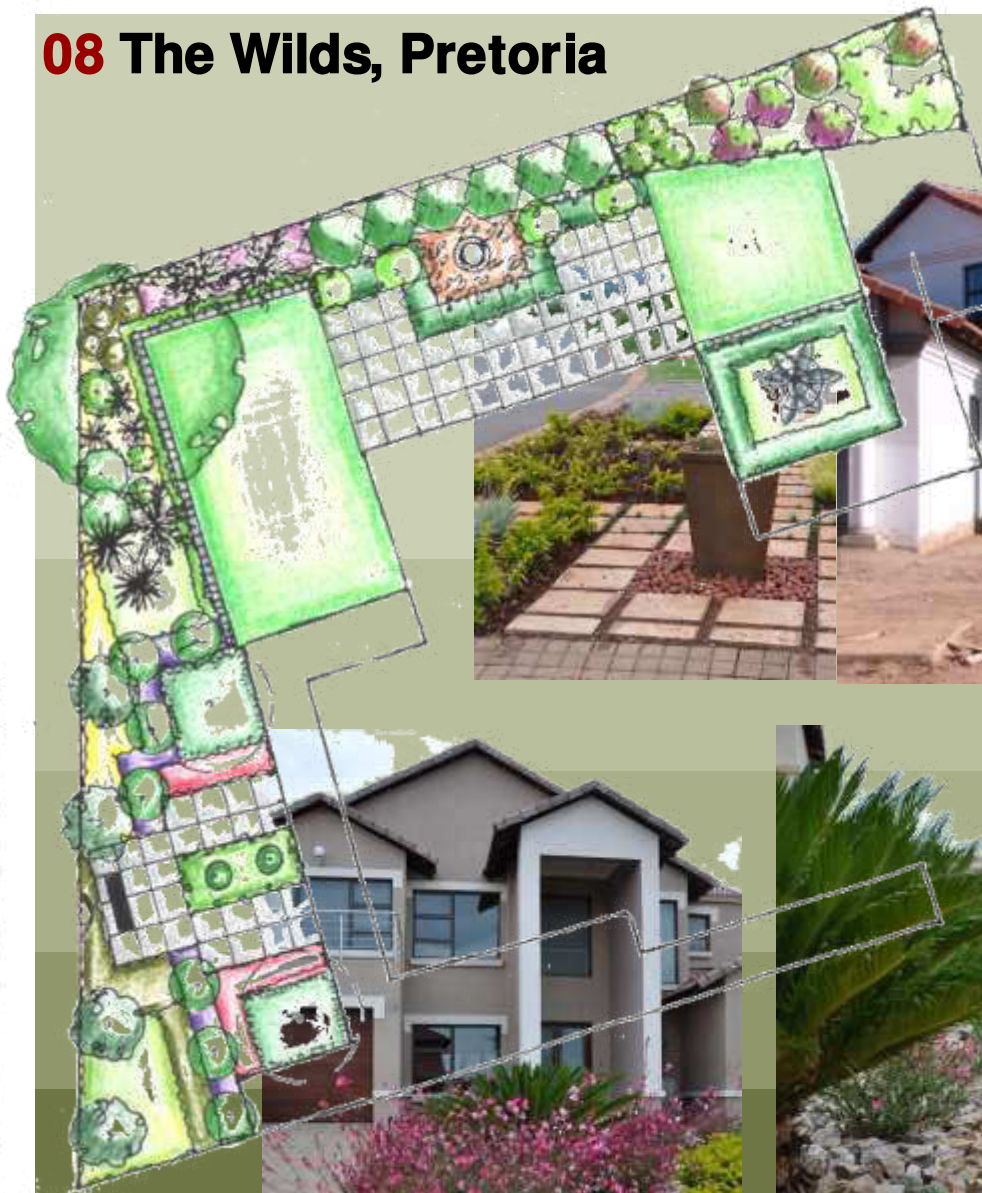
07 The Wilds, Pretoria



05 Landscape Projects – Completed

055 Residential

08 The Wilds, Pretoria

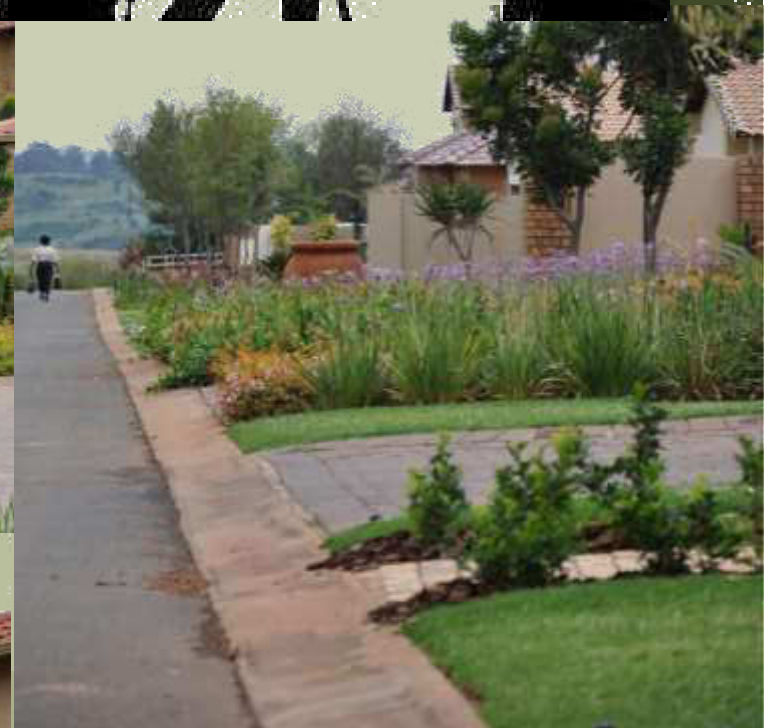


Bokamoso

05 Landscape Projects – Completed

055 Residential

09 The Wilds, Pretoria



Bokamoso

05 Landscape Projects – Completed

055 Residential

010 The Wilds, Pretoria



Bokamoso

05 Landscape Projects – Completed

055 Residential

011 Governor of Reserve Bank's Residence, Pretoria



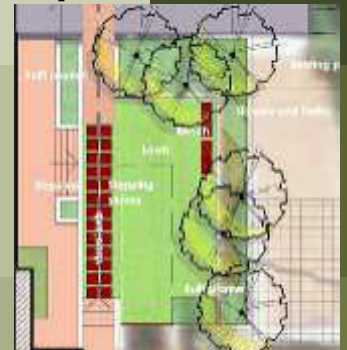
Plant Palette



Option 1



Option 2



Bokamoso

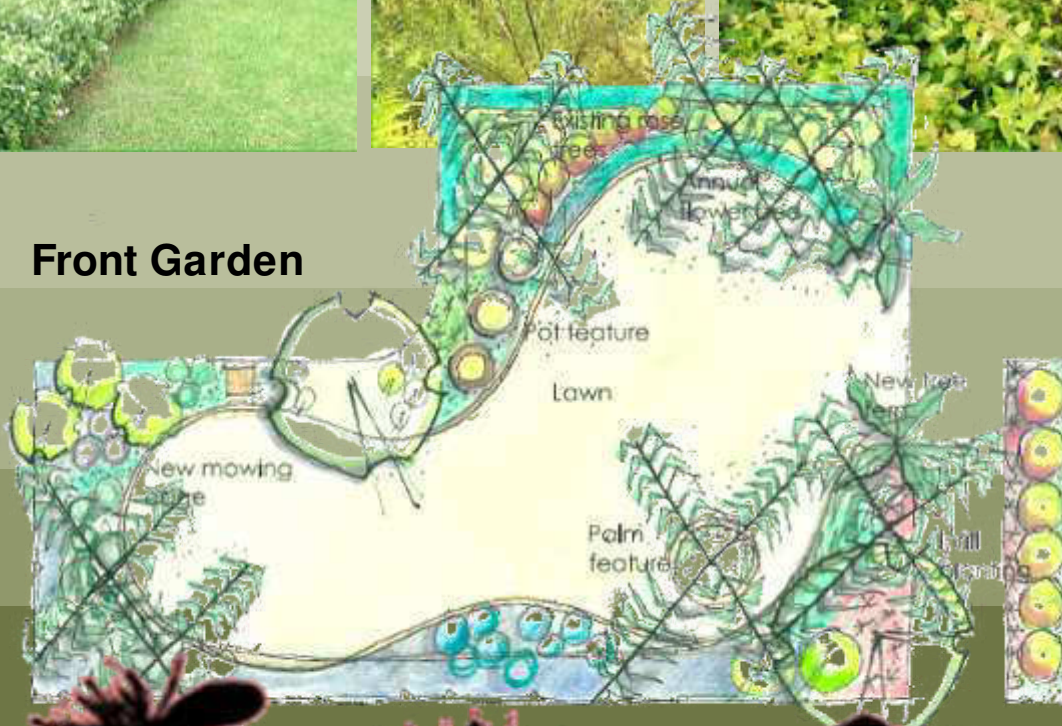
05 Landscape Projects – Conceptual

055 Residential

012 House Ismail, Pretoria



Front Garden



Back Garden



05 Landscape Projects - Conceptual

055 Residential

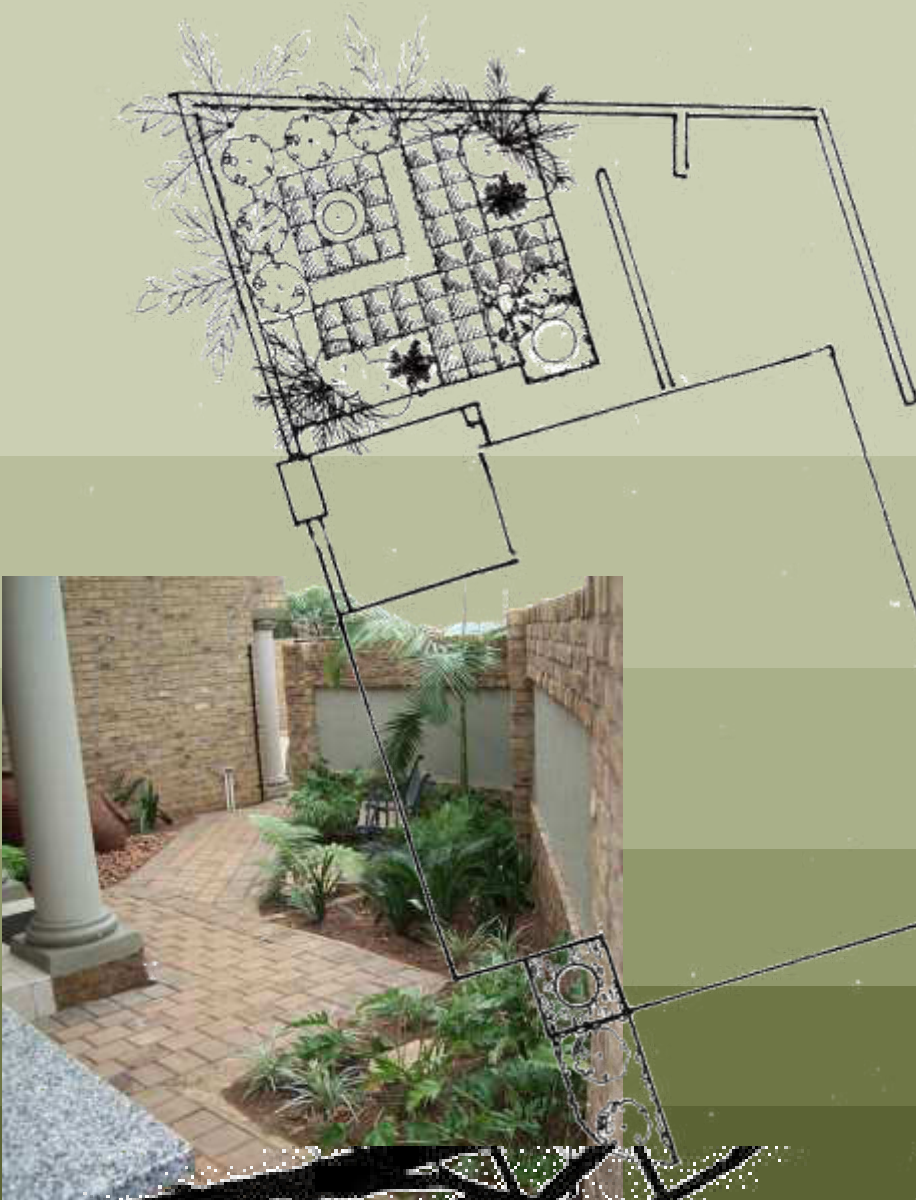
013 Forest Garden, Pretoria



05 Landscape Projects – Completed

055 Residential

015 Forest Garden, Pretoria



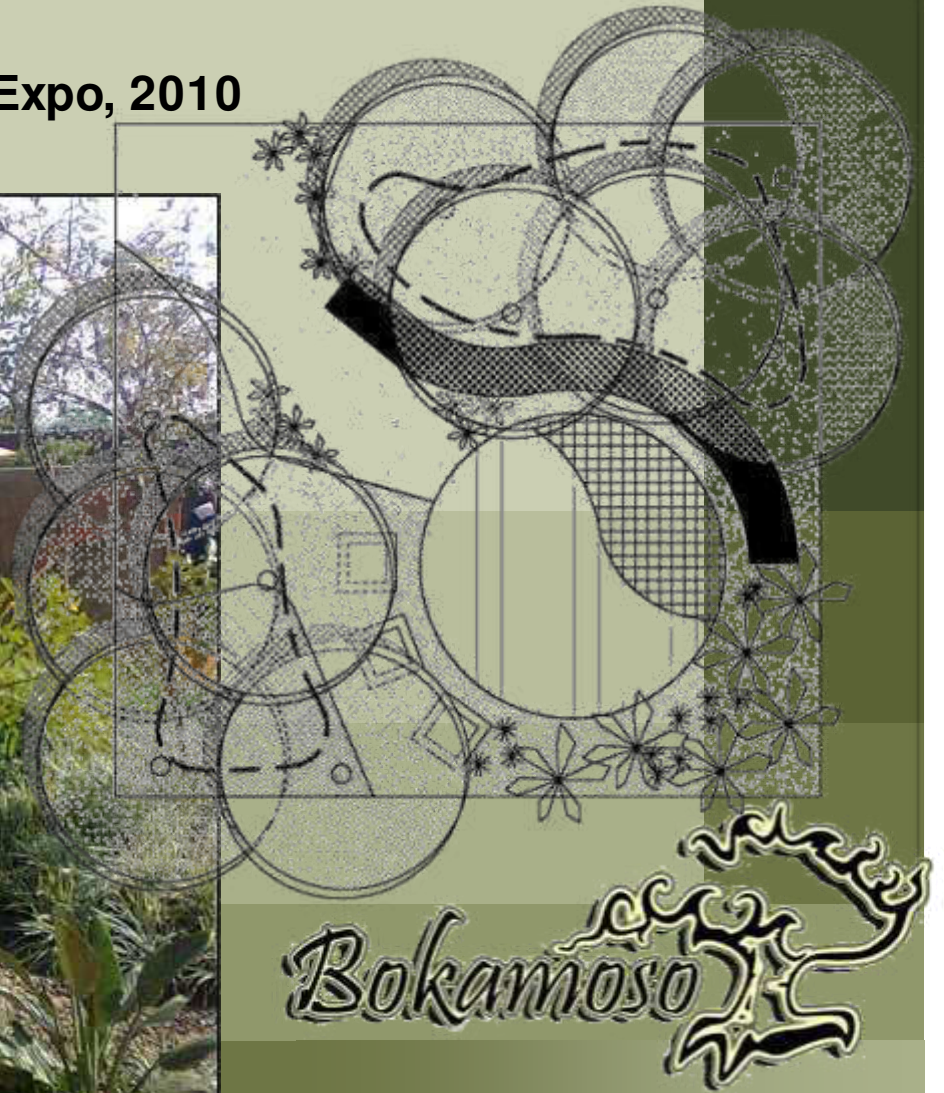
Bokamoso

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



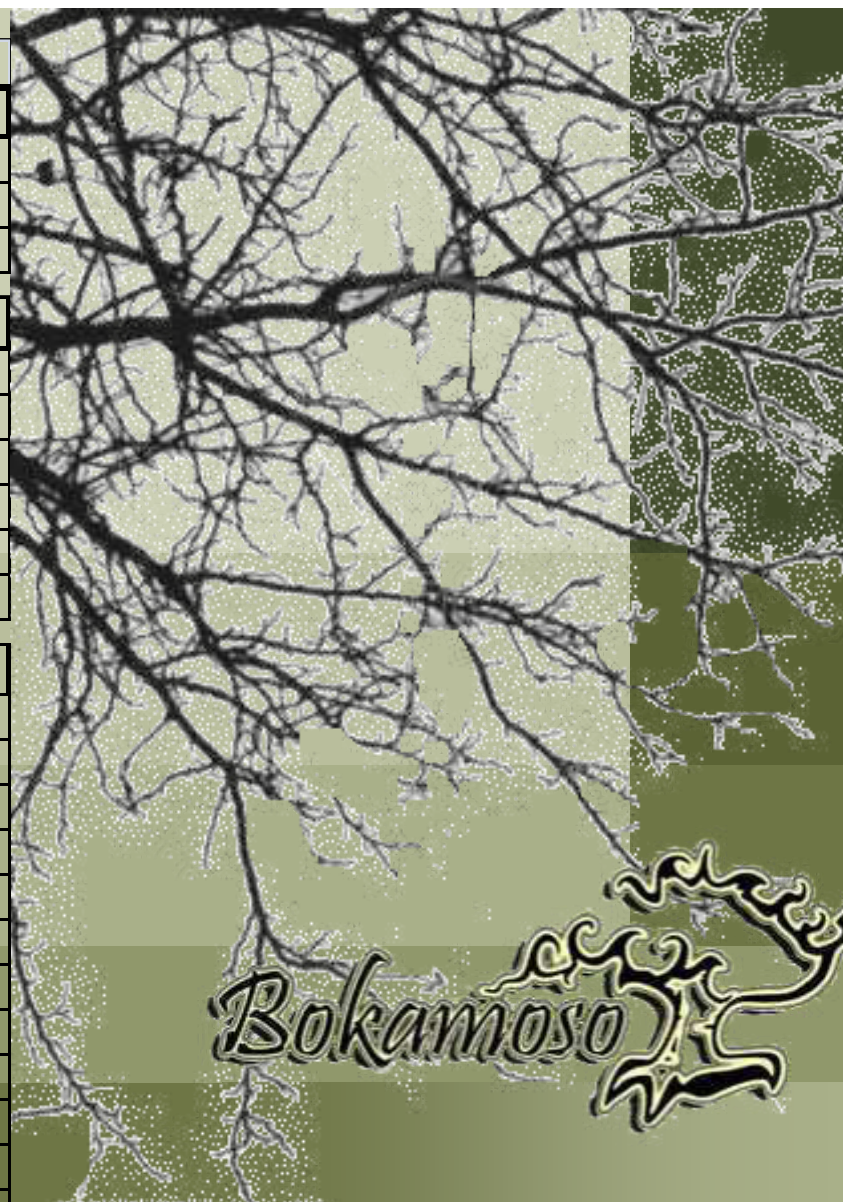
Project Name	Status	Project
Objection		
Colesberg WWTW	In Progress	Objection
Nigel Steelmill	Completed	Objection
Chantilly Waters	Completed	Objection

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



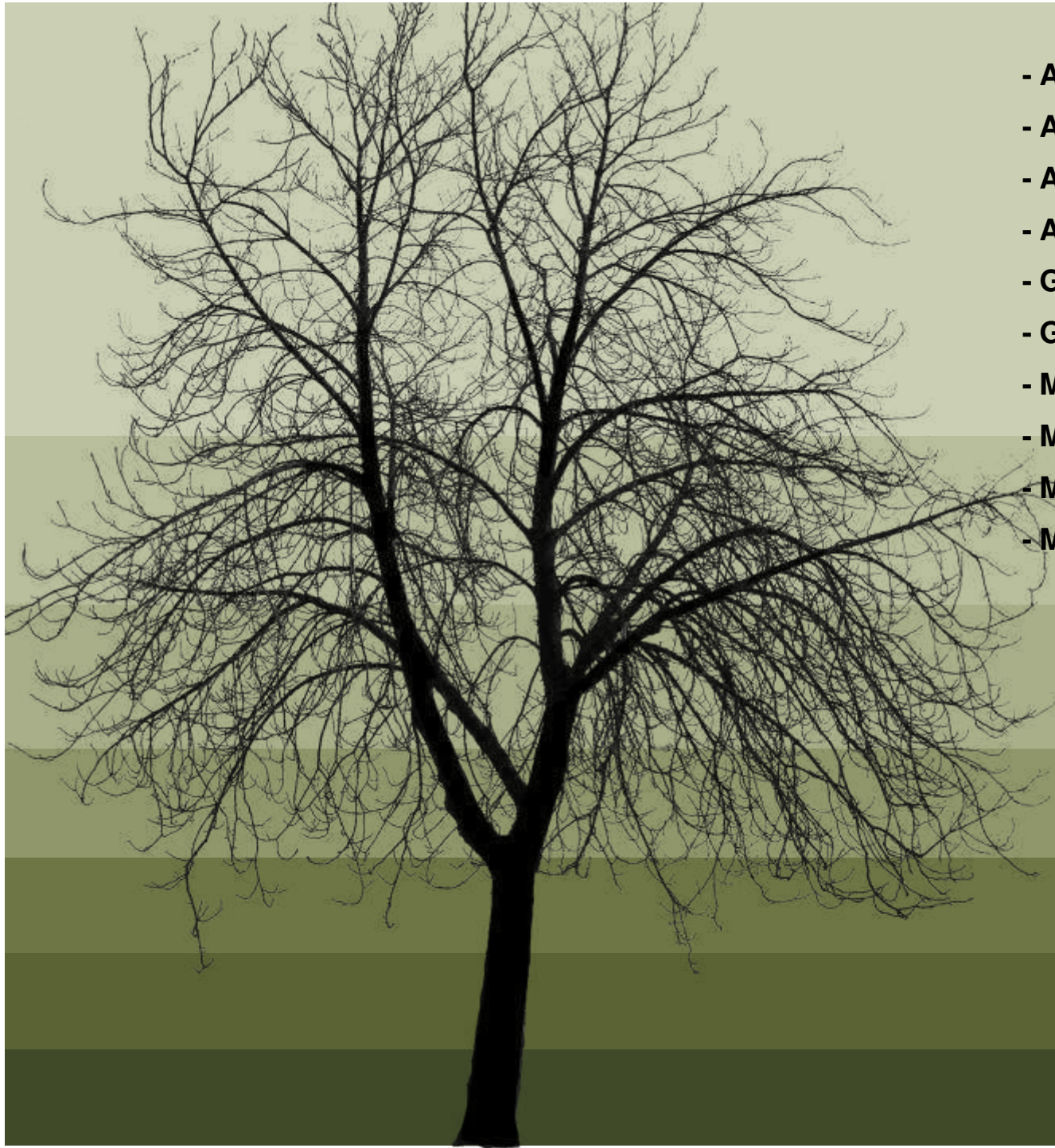
07 Current Environmental Projects

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



ANNEXURE D:

SPECIALIST REPORTS

ANNEXURE D1:

BIODIVERSITY ASSESSMENTS

ANNEXURE D1i:
FLORA & FAUNA HABITAT
ASSESSMENT

GALAGO ENVIRONMENTAL



Fauna and Flora Specialists

638 Turf St

Wingate Park, 0181

Tel: 012-345 4891

Fax: 086 675 6136

Email: Vanessam@lantic.net

Flora and Fauna Habitat Assessment

of

PORTIONS 27 AND 73 OF THE FARM NIETGEDACHT 535-JQ

April 2011

GDARD reference number:

Report Compiled and edited by:
Report authors:

Ms. Vanessa Marais of Galago Environmental
Dr. I.L. Rautenbach (Pri. Sci. Nat: Ph.D, T.H.E.D.),
Mr. W.D. Haacke (Pri. Sci. Nat: M.Sc),
Mrs. P. Lemmer (Cert. Sci. Nat: B.Sc.)
Mr. R.F. Geyser
Dr. Alan C. Kemp (Pri.Sci. Nat.)
Dr L.A. Coetzer (D.Sc., Pri. Sci. Nat.)

Avifauna Report verified by:
Botany Report verified by:

TABLE OF CONTENTS

1.	Introduction:	3
2.	Location of the study site:	3
3.	Participating Specialists	3
5.	Vegetation assessment:.....	4
6.	Fauna assessment:.....	4
7.	Mitigation:.....	5
8.	Environmental sensitivity:	5
9.	Conclusion:	6
10.	GDARD biodiversity requirements	6
APPENDIX A: FLORA REPORT		7
APPENDIX B: MAMMAL REPORT		8
APPENDIX C: AVIFAUNA REPORT.....		9
APPENDIX D: HERPETOFAUNA REPORT		10

FIGURES:

Figure 1: Locality map of the study area	3
Figure 2: Combined environmental sensitivity map.....	5

1. Introduction:

Galago Environmental CC was appointed to conduct a mammal, bird, reptile, amphibian and plant survey for Portions 23 and 73 of the farm Nietgedacht 535-JQ scheduled for residential development.

2. Location of the study site:

The study site lies in the western quadrant of the crossing of highway N14 and 6th Road (Road R552). A drainage line, fed by the run-off from the highway, runs in a north-westerly direction towards a small tributary of the Jukskei River.

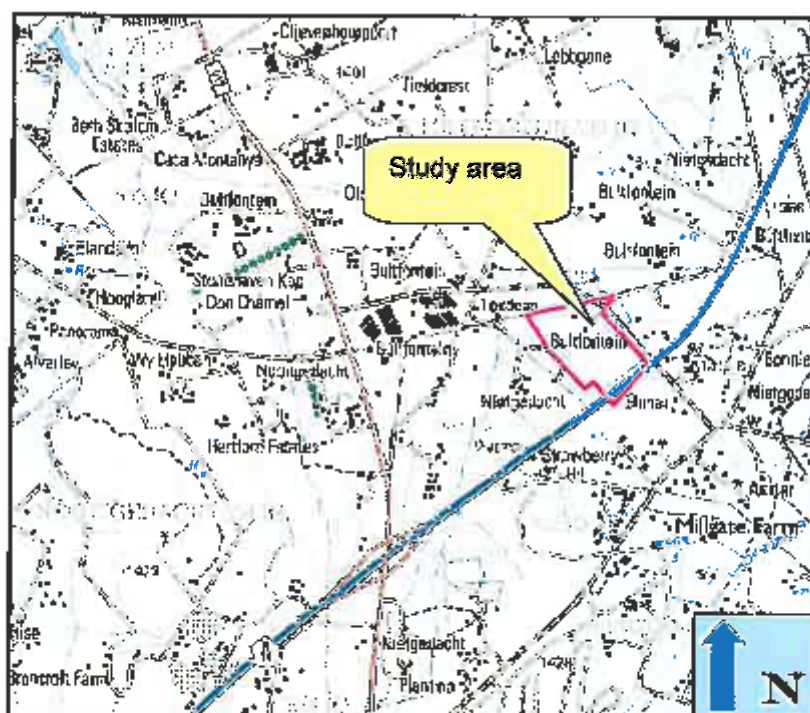


Figure 1: Locality map of the study area

3. Participating Specialists

This investigation was conducted by the following specialists:

Specialists	Aspect Investigated	Qualifications	Prof. Registration	Date of Field Survey
Rautenbach, L.L.	Mammalogy	Ph.D., T.H.E.D.	Pr. Nat. Sci.	1 March 2011
Haacke, W.D.	Herpetology	M.Sc. (Zoology)	Pr. Nat. Sci.	26 February 2011
Geyser, R.	Avifauna		Pending	26 February 2011
Lemmer, P.	Botany	B.Sc.	Cert. Sci. Nat	1 March 2011
Coetzer, L.A.	Botany Review	D.Sc.	Pr. Nat. Sci.	
Kemp, A.C.	Avifauna review	Ph.D.	Pr. Nat. Sci.	
Marais, V.	Environmental Impacts and maps	BL Landscape Architecture		26 February 2011

5. Vegetation assessment:

Mucina & Rutherford (2006) classify the vegetation of this 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.

Three vegetation study units were identified:

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

The grassland on the site was secondary grassland with limited connectivity. The northern quarter of the site comprised mixed alien and indigenous vegetation. No habitat for Red List plants existed on the study site or on any of the surrounding plots to a distance of 200 m around the site.

The Drainage line vegetation was deemed sensitive and should be excluded from development and must be connected to other drainage lines on the neighbouring properties to facilitate connectivity. Dumping of builders' rubble and other waste in the areas earmarked for exclusion must be prevented, through fencing or other management measures. These areas must be properly managed throughout the lifespan of the project in terms of fire, eradication of exotics etc. to ensure continuous biodiversity. See Appendix A for the Flora report.

6. Fauna assessment:

The mammal study found that the floral composition of the terrestrial habitat can no longer be regarded as typical of Egoli Granite Grassland and is therefore not a sensitive unit. The present succession climax is nevertheless good habitat for the small mammals deduced to persist. However, neither this habitat nor the assemblage of mammals can be regarded as unique and worthy of blanket conservation.

- ✓ The drainage line supports two sensitive rodents. In itself the drainage line / wetland is largely artificial (runoff stormwater from the highway), and is furthermore marginal since it is highly dependent of seasonal rainfall. The drainage line on the study site contributes to better-formed wetlands at lower altitudes, and will be more so during the operational phase of the project and implementation of the proposed mitigation measures.

- ✓ Given the acceptance of the proposed mitigation measures, 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), significant loss of mammal habitat, nor of loss/displacement of threatened or protected species. See Appendix B for the Mammal report.

The avifauna study found that in general, 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 areas surrounding the study site are increasingly being developed to make room for residential areas. The disturbed

grassland area will only attract the more common grassland avifauna species and the rest of the study site will attract bird species that are able to adapt to the transformed and disturbed areas. Of all the 27 Red Data avifauna species recorded for the 2527DD q.d.g.c. none are likely to make use of the habitat system identified on and within 500 m surrounding the study site on a permanent or temporarily basis due to a lack of suitable breeding, roosting and foraging habitat. See Appendix C for the Avifauna report.

The herpetological study found that the sloping terrain and dense grassland do not appear to be particularly suitable for reptiles and amphibians. No Red Data species are expected to occur here. The Giant Bullfrog, recorded from this grid cell, has not been confirmed from this study site and the habitat does not appear suitable. The range of the Southern African Python does not enter this area. The terrain in general is viewed as suitable to support only relatively low population densities of herpetofauna. The normally recommended conservation measures should concentrate on an awareness campaign amongst the labour force, directed at avoiding unnecessary killing and promoting the removal and release of species into nearby undisturbed or conservation areas. See Appendix D for the herpetological report.

7. Mitigation:

Mitigation proposed is that only indigenous plant species, preferably species that are indigenous to the natural vegetation of the area, should be used for landscaping in communal areas.

8. Environmental sensitivity:



Figure 2: Combined environmental sensitivity map

Sensitivity mapping rules:

BIODIVERSITY ELEMENT	SENSITIVITY MAPPING RULE
Flora communities	Sensitive flora communities
Fauna habitat	Sensitive fauna habitat

9. Conclusion:

The grassland on site is secondary and in general has a low environmental sensitivity since it has been degraded through past disturbances on the site. The drainage line is considered sensitive in terms of flora and as a dispersal corridor for wetland mammals. It is recommended that a wetland specialist should investigate the extent of the drainage line in terms of wetlands and propose suitable buffers if necessary.

10. GDARD biodiversity requirements

From: GDARD Biodiversity Information (GDARD)

[GDACE_BiodiversityInfo@gauteng.gov.za]

Sent: 02 March 2011 03:00 PM

To: Madeleen van Schalkwyk

Subject: RE: Biodiversity requirements for Nietgedacht, Noolgedacht and Bultfontein

Dear Madeleen

With regard to the above project, specialist biodiversity studies are required to investigate the following aspects:

* Reptiles, with specific reference to *Homoroselaps dorsalis* (Striped Harlequin Snake).

The absence of wetlands on site should be verified. Should a wetland be located, a wetland specialist study will be required.

APPENDIX A: FLORA REPORT

GALAGO ENVIRONMENTAL



Fauna and Flora Specialists

638 Turf Street

Wingate Park, 0181

Tel: 012-345 4891

Fax: 086 675 6136

Email: Vanessam@lantic.net

Flora Assessment

of

**PORTIONS 27 AND 73 OF THE FARM
NIETGEDACHT 535-JQ**

April 2011

Report author:

Mrs. P. Lemmer (Cert. Sci. Nat: B.Sc.)

Report verified/reviewed by:

Dr. L.A. Coetzer (D.Sc., Prof. Nat. Sci.)

VERIFICATION STATEMENT

Petro Lemmer is a Certified Natural Scientist with the S.A. Council for Natural Scientific Professions. This communication serves to verify that the flora report compiled by Petro Lemmer has been prepared under my supervision, and I have verified the contents thereof.

Declaration of Independence: I, Dr. L.A. Coetzer (421009 5029 089) declare that I:

- am committed to biodiversity conservation but concomitantly recognize the need for economic development. Whereas I appreciate the opportunity to also learn through the processes of constructive criticism and debate, I reserve the right to form and hold my own opinions and therefore will not willingly submit to the interests of other parties or change my statements to appease them
- abide by the Code of Ethics of the S.A. Council for Natural Scientific Professions
- act as an independent specialist consultant in the field of botany
- am subcontracted as specialist consultant by Galago Environmental CC for the proposed development project on portions 23 and 73 of the farm Nietgedacht 535 JQ described in this report
- have no financial interest in the proposed development other than remuneration for work performed
- have or will not have any vested or conflicting interests in the proposed development
- undertake to disclose to the Galago Environmental CC and its client as well as the competent authority any material information that have or may have the potential to influence the decision of the competent authority required in terms of the Environmental Impact Assessment Regulations, 2006.



Dr. L.A. Coetzer

TABLE OF CONTENTS

1.	INTRODUCTION	4
2.	OBJECTIVES OF THE STUDY	4
3.	SCOPE OF STUDY	4
4.	STUDY AREA	4
5.	METHOD	5
6.	RESULTS.....	6
6.1	Study units	6
6.2	Medicinal plants.....	6
6.3	Alien plants.....	7
6.4	Orange List species.....	7
6.5	Red List species.....	8
6.6	Mixed alien and indigenous vegetation.	8
6.7	Drainage line vegetation.....	11
6.8	Eragrostis – Hyparrhenia grassland.	13
7.	FINDINGS AND POTENTIAL IMPLICATIONS.....	15
8.	LIMITATIONS, ASSUMPTIONS AND GAPS IN KNOWLEDGE	15
9.	RECOMMENDED MITIGATION MEASURES	15
10.	CONCLUSION	16
11.	LITERATURE SOURCES	17
	ANNEXURE A: Red– and Orange List* plants of the 2527DD q.d.g.c.	19

FIGURES:

Figure 1: Locality map of the study area	5
Figure 2: Vegetation Study units.....	7
Figure 3: Mixed alien and Indigenous vegetation.....	9
Figure 4: Vegetation sensitivity map.....	17

TABLES:

Table 1: Number of medicinal species in the various study units	6
Table 2: Number of Alien species in each study unit.....	7
Table 3: Plants recorded in the Mixed alien and indigenous vegetation	10

1. INTRODUCTION

Galago Environmental was appointed to conduct a vegetation survey on Portions 23 and 73 of the farm Nietgedacht 535-JQ scheduled for residential development. The objective was to determine which species might still occur on the site. Special attention had to be given to the habitat requirements of all the Red List species that may occur in the area. This survey focuses on the current status of threatened plant species occurring, or which are likely to occur on the study site, and a description of the available and sensitive habitats on the site and within 200 meters of the boundary of the site.

2. OBJECTIVES OF THE STUDY

- To assess the current status of the habitat component and current general conservation status of the area;
- To list the perceptible flora of the site and to recommend steps to be taken should endangered, vulnerable or rare species be found;
- To highlight potential impacts of the development on the flora of the proposed site; and
- To provide management recommendations to mitigate negative and enhance positive impacts should the proposed development be approved.

3. SCOPE OF STUDY

This report:

- Lists the more noticeable trees, shrubs, herbs, geophytes and grasses observed during the study and offers recommendations about the preservation of the sensitive areas on the site;
- Indicates medicinal plants recorded and lists alien species;
- Comments on connectivity with natural vegetation on adjacent sites;
- Comments on ecological sensitive areas;
- Evaluates the conservation importance and significance of the site with special emphasis on the current status of resident threatened species; and
- Offers recommendations to reduce or minimise impacts, should the proposed development be approved

4. STUDY AREA

4.1 Regional vegetation

The study site lies in the quarter degree grid square 2528CA (Pretoria). Mucina & 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 of roads. Current rates of transformation threaten most of the remaining unconserved areas.

4.2 The study site

The study site lies in the western quadrant of the crossing of highway N14 and 6th Road (Road R552). A drainage line, fed by the run-off from the highway, runs in a north-westerly direction towards a small tributary of the Jukeskei River.

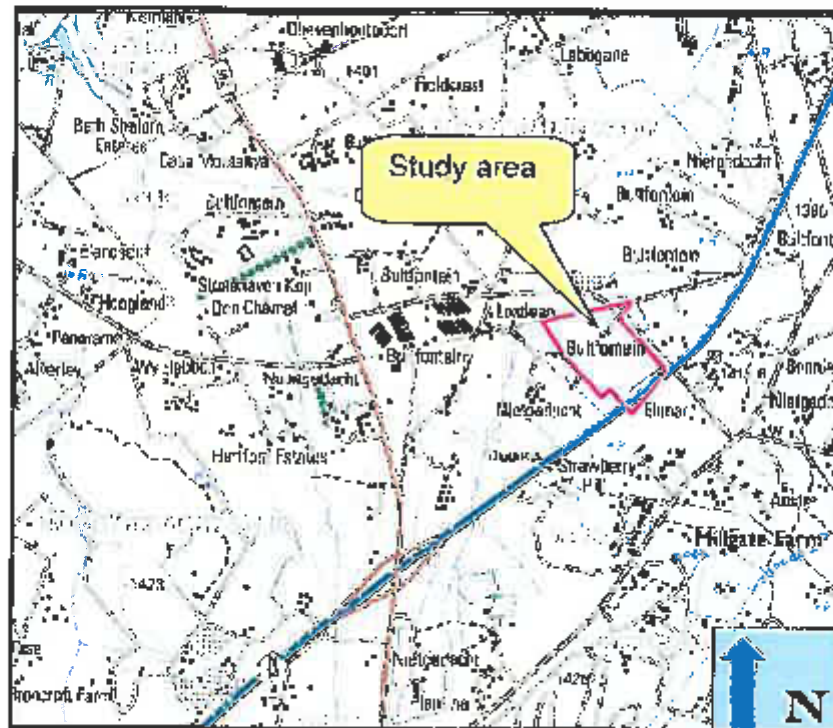


Figure 1: Locality map of the study area

5. METHOD

Information about the Red List and Orange List plant species that occur in the area was obtained from GDARD (GDACE). The Guidelines issued by GDARD (GDACE) to plant specialists were consulted to ascertain the habitat of the Red- and Orange List species concerned.

The SANBI list of plants recorded in the 2527DD quarter degree grid square was obtained and consulted to verify the record of occurrence of the plant species seen on the site. The vegetation map published in Mucina and Rutherford (2006) was consulted about the composition of Egoli Granite Grassland. A desktop study of the habitats of the Red List and Orange List species known to occur in the area was done before the site visit.

The study site was visited on 1 March 2011 to determine whether suitable habitat for the Red List species known to occur in the quarter degree grid square existed and to survey the flora present on the site.

The various study units were identified (see Figure 2) and one or more plots, depending on the size and composition of the study unit, were selected at random from each study unit for detailed study. Each plot, which measured about 10m x 10m, was surveyed in a random

crisscross fashion and the plants recorded. Areas where the habitat was suitable for the Red List species known to occur in the quarter degree grid square were examined in detail.

Suitable habitat for Red List species on the neighbouring properties, where accessible, was examined to a distance of 200 m from the boundaries of the site for the presence of Red List plant species.

6. RESULTS

6.1 Study units

Three vegetation study units were identified:

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

Tables 3 to 5 list the trees, shrubs, geophytes, herbs and grasses actually found on each of the surveyed areas of the site.

6.2 Medicinal plants

The names of known medicinal plants are marked with numbers to footnotes in Tables 3 to 5 and the footnotes themselves appear at the end of the last table. Of the 89 plant species recorded on the site, seven species with medicinal properties were found. Their distribution in the various study units is as follows:

Table 1: Number of medicinal species in the various study units

STUDY UNIT	TOTAL NO OF SPECIES IN STUDY UNIT	NO OF MEDICINAL SPECIES IN STUDY UNIT
Mixed alien and indigenous vegetation	40	1
Drainage line vegetation	38	4
<i>Eragrostis</i> – <i>Hyparrhenia</i> grassland	37	6

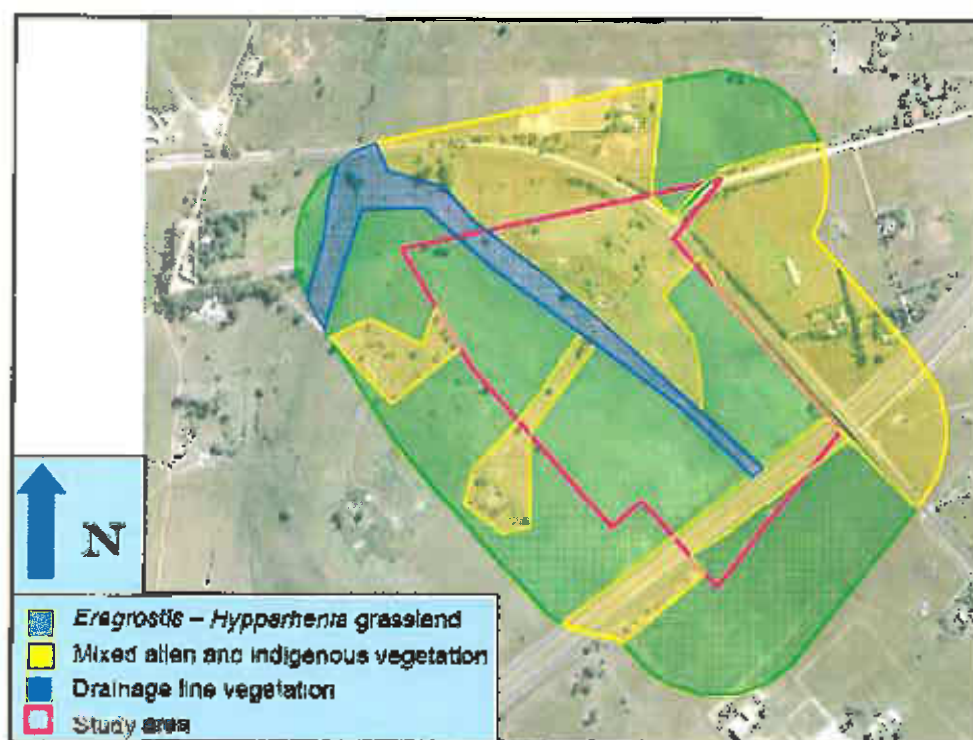


Figure 2: Vegetation Study units

6.3 Alien plants

Alien plants are not listed separately, but are included in the lists as they form part of each particular study unit. Their names are marked with an asterisk in Tables 3 to 5. Twenty-eight alien plant species, of which three species were Category 1 Declared weeds, two were Category 2 Declared invaders and five were Category 3 Declared invaders, were recorded on the site. The number of alien species in each study unit is reflected in table 2.

Table 2: Number of Alien species in each study unit

STUDY UNIT	NO. OF ALIEN SPECIES	CAT 1	CAT 2	CAT 3	NOT DECLARED
Mixed alien and indigenous vegetation	24	3	2	5	14
Drainage line vegetation	8	0	0	0	8
<i>Eragrostis - Hyparrhenia</i> grassland	2	0	1	0	1

The alien plant names printed in **bold** in the plant tables are those of Category 1 Declared Weeds and the removal of these plants is **compulsory** in terms of the regulations formulated under "The Conservation of Agricultural Resources Act" (Act No. 43 of 1983), as amended.

In terms of these regulations, Category 2 Declared invaders may not occur on any land other than a demarcated area and should likewise be removed.

Although the regulations under the above Act require that Category 3 Declared invader plants may not occur on any land or inland water surface other than in a biological control reserve, these provisions shall not apply in respect of category 3 plants already in existence at the time of the commencement of said regulations. If this is the case, a land user must take all reasonable steps to curtail the spreading of propagating material of Category 3 plants.

6.4 Orange List species

The habitat was suitable for two of the five Orange List plant species known to occur in the 2527DD quarter degree grid square. Only one of these, the African potato (*Hypoxis*

hemerocallidea) was found. (See Annexure A for a list of the Orange- and Red List species known to occur in the quarter degree grid square.)

6.5 Red List species

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

6.6 Mixed alien and indigenous vegetation.

6.6.1 Compositional aspects

Sixty percent of the vegetation of this study unit comprised alien species. Of the 89 plant species recorded on the site 40 were recorded in the Mixed alien and indigenous vegetation study unit. Of these, 16 were indigenous species. The following number of species in each life form was noted:

LIFE FORM	NUMBER OF SPECIES
Annual & perennial herbaceous species	23
Tree species	7
Shrubs and dwarf shrubs	2
Grasses	5
Geophytes	1
Sedges	1
Succulents	1
Total No of species	40

6.6.2 Red- and Orange List species

The habitat of this study unit was not suitable for any of the Red List or Orange List species known to occur in the quarter degree grid square.

6.6.3 Medicinal and alien species

Twenty-four of the 28 alien species recorded on the site were found in this study unit. Of these, three were Category 1 Declared weeds, two were Category 2 Declared invaders and five were Category 3 Declared invaders. One medicinal species was recorded.

6.6.4 Sensitivity

This study unit was not considered sensitive.



Figure 3: Mixed alien and indigenous vegetation.



Figure 4: A large expanse of Kikuyu grass forms part of the Mixed alien and indigenous vegetation.

Table 3: Plants recorded in the Mixed alien and indigenous vegetation

SCIENTIFIC NAME	ALIEN CAT	COMMON NAMES
<i>Asparagus laricinus</i>		Wild asparagus / Katbos
<i>Bidens bipinnata</i> *		Spanish blackjack / Spaanse knapsekêrel
<i>Bidens pilosa</i> *		Blackjack / Knapsekêrel
<i>Celtis africana</i>		White stinkwood / Witstinkhout
<i>Chamaecrista biensis</i>		
<i>Commelina benghalensis</i> *		Blouseblommetjie
<i>Conyza albida</i> *		Tall fleabane / Vaalskraalhans
<i>Conyza podocephala</i>		
<i>Crotalaria sphaerocarpa</i> subsp <i>sphaerocarpa</i>		Mealie crotalaria / Mielie crotalaria
<i>Cynodon dactylon</i>		Couch grass / Kweek
<i>Cyperus esculentus</i> var <i>esculentus</i>		Yellow nutsedge / Geeluintjie
<i>Echinopsis spachiana</i> *	1	Torch cactus / Orrelkaktus
<i>Eragrostis curvula</i>		Weeping love grass / Oulandsgras
<i>Eucalyptus</i> sp*	2	Gum tree / Bloekom
<i>Euphorbia hirta</i> *		Red milkweed / Rooimalkkruid
<i>Gomphrena colosioides</i> *		Bachelor's button / Mierbossie
<i>Grevillea robusta</i> *	3	Australian silky oak / Australiese silwereik
<i>Indigofera suffruticosa</i> *		
<i>Ipomoea purpurea</i> *	3	
<i>Jasminum nudiflorum</i> *		Yellow jasmyn / Geeljasmyn
<i>Lantana camara</i> *	1	Lantana
<i>Leonotis intermedia</i>		Wild dagga / Wildedagga
<i>Ligustrum cf sinense</i> *	3	Chinese privet / Sjinese liguster
<i>Melia azedarach</i> *	3	Syringa / Sering
<i>Morus alba</i> *	3	Common mulberry / Gewone moerbeï
<i>Pennisetum clandestinum</i> *		Kikuyu / Kikoejoe
<i>Pseudognaphalium luteo-album</i> *		

SCIENTIFIC NAME	ALIEN CAT	COMMON NAMES
<i>Selago densiflora</i>		Koningstapyt
<i>Sida rhombifolia</i> subsp <i>rhombifolia</i>		Arrow leaf Sida / Taaiman
<i>Solanum mauritianum</i> *	1	Bugweed / Luisboom
<i>Sorghum halepense</i> *	2	Johnson grass / Johnsongras
<i>Sporobolus africanus</i>		Rat's tail dropseed / Taaipol
<i>Stylosanthes fruticosa</i>		
<i>Tagetes minuta</i> *		Khaki weed / Kakiebos
<i>Verbena aristigera</i> *		Fine-leaved verbena / Fynblaar verbena
<i>Verbena bonariensis</i> *		Purple top / Blouwaterbossie
<i>Verbena brasiliensis</i> *		
<i>Vernonia oligocephala</i> ^{1,2}		Cape vernonia / Blounaaldetee bossie
<i>Vigna unguiculata</i> subsp <i>stenophylla</i>		
<i>Wahlenbergia cf undulata</i>		

6.7 Drainage line vegetation.

6.7.1 Compositional aspects and Connectivity

The drainage line, fed by the run-off from the highway, runs in a north-westerly direction towards a tributary of the Jukskei River. The vegetation of this study unit comprised mostly natural vegetation dominated by the Green button sedge *Kyllinga erecta*. Connectivity with drainage line vegetation existed to the north. The species diversity of this study unit was low. Of the 89 plant species recorded on the site 38 were recorded in the Drainage line vegetation study unit. Of these, 30 were indigenous species. The following number of species in each life form was noted:

LIFE FORM	NUMBER OF SPECIES
Annual & perennial herbaceous species	19
Grasses	13
Geophytes	2
Sedges	4
Total No of species	38

6.7.2 Red- and Orange List species

The habitat of this study unit was not suitable for any of the Red List species. A few specimens of the Orange List African Potato (*Hypoxis hemerocallidea*) were found on the banks of the drainage line on the boundary of the *Eragrostis* – *Hypantheria* grassland.

6.7.3 Medicinal and alien species

Four of the seven medicinal species recorded on the site were found in this study unit. Eight alien species, none of them declared invader species, were recorded in the Drainage line vegetation.

6.7.4 Sensitivity

A wetland specialist should determine the extent of the wetland around the drainage line. As wetlands form biological filters and drainage lines form corridors for the movement of species, which include pollinators of plant species, this study unit was considered sensitive and should be excluded from development. A suitable buffer area should be maintained around the wetland if so determined by the wetland specialist.



Figure 5: Drainage line vegetation, seen as an olive green strip.

Table 4: Plants recorded in the Drainage line vegetation

SCIENTIFIC NAME	COMMON NAMES
<i>Berkheya radula</i>	Boesmanrietjie
<i>Chamaecrista biensis</i>	
<i>Commelina subulata</i>	
<i>Conyza podocephala</i>	
<i>Cynodon dactylon</i>	Couch grass / Kweek
<i>Cyperus congestus</i>	
<i>Cyperus esculentus</i> var <i>esculentus</i>	Yellow nutsedge / Geeluintjie
<i>Eragrostis chloromelas</i>	Curly leaf / Krulblaar
<i>Eragrostis curvula</i>	Weeping love grass / Oulandsgras
<i>Eragrostis gummiiflua</i>	Gum grass / Gomgras
<i>Eragrostis plana</i>	Tough love grass / Taaipoleragrostis
<i>Fimbristylis complanata</i>	
<i>Gomphrena celosioides</i> *	Bachelor's button / Mierbossie
<i>Helichrysum nudifolium</i> var <i>nudifolium</i> ^{1,2}	Hottentot's tea / Hottentotstee
<i>Hermannia depressa</i> ^{2,3}	Creeping red Hermannia / Rooiopslag
<i>Hyparrhenia hirta</i>	Common thatching grass / Dekgras
<i>Hypoxis acuminata</i>	
<i>Hypoxis hernerocallidea</i> ^{1,2,3}	African potato / Gifbol
<i>Kohautia virgata</i>	
<i>Kyllinga erecta</i> var <i>erecta</i>	Green button sedge / Groenknoop biesie
<i>Nidorella</i> sp	
<i>Oxalis obliquifolia</i>	Sorrel / Suring
<i>Paspalum dilatatum</i> *	
<i>Paspalum notatum</i> *	
<i>Richardia brasiliensis</i> *	Tropical richardia / Tropiese richardia
<i>Rumex crispus</i> *	Curley dock / Krultongblaar
<i>Setaria incrassata</i>	Vlei bristle grass / Vleimannagras
<i>Setaria pumila</i>	Garden bristle grass / Tuin mannagras

SCIENTIFIC NAME	COMMON NAMES
<i>Sporobolus africanus</i>	Rat's tail dropseed / Taaipol
<i>Sporobolus fimbriatus</i>	Bushveld dropseed / Bosveldfynsaadgras
<i>Stylosanthes fruticosa</i>	
<i>Themeda triandra</i>	Red grass / Rooigras
<i>Ursinia nana subsp. nana</i>	Magriet
<i>Verbena aristigera</i> *	Fine-leaved verbena / Fynblaar verbena
<i>Verbena bonariensis</i> *	Purple top / Blouwaterbossie
<i>Verbena brasiliensis</i> *	
<i>Vernonia oligocephala</i> ^{1,2}	Cape vernonia / Blounaaldeetee bossie
<i>Wahienbergia cf. undulata</i>	

6.8 *Eragrostis* – *Hyparrhenia* grassland.

6.8.1 Compositional aspects and Connectivity

This study unit comprised secondary grassland that was well on its way to recovery. Connectivity with natural grassland was limited by surrounding roads. The species diversity of this study unit was low. Of the 89 plant species recorded on the site 37 were recorded in the *Eragrostis* – *Hyparrhenia* grassland. Of these, 35 were indigenous species. The following number of species in each life form was noted:

LIFE FORM	NUMBER OF SPECIES
Annual & perennial herbaceous species	18
Tree species	4
Grasses	13
Geophytes	2
Total No of species	37

6.8.2 Red- and Orange List species

The habitat of this study unit was not suitable for any of the Red List species, but was suitable for the Orange List species *Eucomis autumnalis subsp. clavata* and *Hypoxis hemerocallidea* known to occur in the quarter degree grid square. A few specimens of the *Hypoxis hemerocallidea* (African Potato) were found near the drainage line.

6.8.3 Medicinal and alien species

Six of the seven medicinal species recorded on the site were found in the *Eragrostis* – *Hyparrhenia* grassland study unit. Two alien species were recorded of which one was a Category 2 Declared invader.

6.8.4 Sensitivity

The vegetation of this study unit was not considered sensitive.



Figure 6: *Eragrostis* – *Hyparrhenia* grassland viewed towards the north-west.

Table 5: Plants recorded in the *Eragrostis* – *Hyparrhenia* grassland

SCIENTIFIC NAME	COMMON NAMES
<i>Acacia karkoo</i> ^{1,2}	Sweet thorn / Soetdoring
<i>Acacia</i> sp	
<i>Acacia nilotica</i> subsp. <i>kraussiana</i>	Scented pod / Lekkerruikpeul
<i>Anthospermum rigidum</i> subsp. <i>pumilum</i>	
<i>Aristida congesta</i> subsp. <i>barbicollis</i>	Spreading three-awn grass / Witsteekgras
<i>Commelina africana</i> var. <i>lanceolata</i>	
<i>Convolvulus sagittatus</i>	
<i>Conyza podocephala</i>	
<i>Cucumis zeyheri</i>	Wild cucumber / Wilde agurkie
<i>Cynodon dactylon</i>	Couch grass / Kweek
<i>Digitaria diagonalis</i> var. <i>diagonalis</i>	Brown-seed finger grass / Bruinsaadvingergras
<i>Digitaria monodactyla</i>	One-finger grass / Eenvingergras
<i>Dipcadi viride</i>	Slymuintjie
<i>Elionurus muticus</i>	Wire grass / Draadgras
<i>Eragrostis chloromelas</i>	Curly leaf / Krulblaar
<i>Eragrostis plana</i>	Tough love grass / Taaipoleragrostis
<i>Eucalyptus</i> sp* (Cat 2 Declared Invader)	Gum tree / Bloekom
<i>Felicia muricata</i> subsp. <i>muricata</i> ^{1,2,3}	White felicia
<i>Helichrysum rugulosum</i> ^{2,3}	
<i>Hermannia depressa</i> ^{2,3}	Creeping red Hermannia / Rooiopslag
<i>Heteropogon contortus</i>	Spear grass / Assegaaigras
<i>Hyparrhenia hirta</i>	Common thatching grass / Dekgras
<i>Hypoxis hemerocallidea</i> ^{1,2,3}	African potato / Gifbol
<i>Indigofera oxalidea</i>	
<i>Kohautia caespitosa</i> subsp. <i>brachyloba</i>	
<i>Melinis repens</i> subsp. <i>repens</i>	Red top grass
<i>Microchloa cafra</i>	Pincushion grass / Elsgras

SCIENTIFIC NAME	COMMON NAMES
<i>Monsonia angustifolia</i>	Crane's bill / Angelbossie
<i>Nidorella hottentotica</i>	
<i>Oxalis obliquifolia</i>	Sorrel / Suring
<i>Rhynchosia minima</i> var <i>prostrata</i>	
<i>Richardia brasiliensis</i> ¹	Tropical richardia / Tropiese richardia
<i>Solanum lichtensteinii</i>	Giant bitter apple / Bitterappel
<i>Themeda triandra</i>	Red grass / Rooigras
<i>Trichoneura grandiglumis</i>	Small rolling grass / Klein rolgras
<i>Vernonia oligocephala</i> ^{1,2}	Cape vernonia / Blounaaldeetee bossie
<i>Vigna unguiculata</i> subsp. <i>stenophylla</i>	

¹ Van Wyk, B-E., Van Oudtshoorn, B. & Gericke, N. 2002.

² Watt, J.M. & Breyer-Brandwijk, M.G. 1962.

³ Pooley, E. 1998.

7. FINDINGS AND POTENTIAL IMPLICATIONS

The grassland on the site was secondary grassland with limited connectivity. The northern quarter of the site comprised mixed alien and indigenous vegetation. No habitat for Red List plants existed on the study site or on any of the surrounding plots to a distance of 200 m around the site.

8. LIMITATIONS, ASSUMPTIONS AND GAPS IN KNOWLEDGE

Sufficient information was received and sufficient rain had fallen to accomplish the survey that was done during optimum growing conditions.

9. RECOMMENDED MITIGATION MEASURES

The following mitigation measures were developed by GDARD (Directorate of Nature Conservation, GDACE, 2008 and 2009) and are applicable to the study site. Where appropriate, Galago Environmental's specific elaborations are given in brackets.

- An appropriate management authority (e.g. the body corporate) that must be contractually bound to implement the Environmental Management Plan (EMP) and Record of Decision (ROD) during the operational phase of the development should be identified and informed of their responsibilities in terms of the EMP and ROD.
- All areas designated as sensitive in a sensitivity mapping exercise should be incorporated into an open space system. Development should be located on the areas of lowest sensitivity.
- The open space system should be managed in accordance with an Ecological Management Plan that complies with the *Minimum Requirements for Ecological Management Plans* and forms 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 non-indigenous 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)
 - result in a report back to the Directorate of Nature Conservation on an annual basis
- The open space system should be fenced off 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 excluded from the open space system. 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 indigenous fauna should however be allowed (i.e. no solid walls, e.g. through the erection of palisade fencing).
 - 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 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 stormwater runoff, total sealing of paved areas such as parking lots, driveways, pavements and walkways should be avoided. Permeable material should rather be utilized for these purposes.
 - The crossing of natural drainage systems should be minimized and only constructed at the shortest possible route, perpendicular to the natural drainage system. Where possible, bridge crossings should span the entire stretch of the buffer zone (see *Sensitivity Mapping Rules for Biodiversity Assessments* for buffer zone requirements).

10. CONCLUSION

The Drainage line vegetation was deemed sensitive and should be excluded from development and must be connected to other drainage lines on the neighbouring properties to facilitate connectivity. Dumping of builders' rubble and other waste in the areas earmarked for exclusion must be prevented, through fencing or other management measures. These areas must be properly managed throughout the lifespan of the project in terms of fire, eradication of exotics etc. to ensure continuous biodiversity.

All Category 1 Declared Weeds, Category 2 and 3 Declared invaders and other alien species must be removed from the site.



Figure 4: Vegetation sensitivity map

11. LITERATURE SOURCES

- Botha C. 2001. *Common weeds of crops and gardens in southern Africa*. ARC – Grain Crops Institute, Agricultural Research Council, Pretoria.
- Bothalia. 1962. Volume 8, part 1 (The Cucurbitaceae of Southern African). Botanical Research Institute, Department of Agricultural Technical Services, Pretoria.
- Bromilow, C. 2001. *Problem plants of South Africa*. Briza Publications, Pretoria
- Chippendall, L.K.A. *et. al.* 1955. *The grasses and pastures of South Africa*. Central News Agency, Cape Times Limited, Parow.
- Eardley, C. 2002. *Pollinators for Africa*. ARC – Plant Protection Research Institute, Department of Agriculture, Pretoria.
- Eardley, C.; Roth, D.; Clarke, J.; Buchmann, S. and Gemmill, B. 2006. *Pollinators and pollination: a resource book for policy and practice*. African Pollinator Initiative (API)
- Fabian, A. & Germishuizen, G. 1997. *Wild flowers of northern South Africa*. Fernwood Press, Cape Town.
- Germishuizen, G. & Clarke, B. 2003. *Illustrated guide to the Wildflowers of northern South Africa*. Briza Publications, Pretoria.
- Germishuizen, G. & Meyer, N.L. (eds) 2003. *Plants of southern Africa: an annotated checklist*. *Strelitzia* 14, National Botanical Institute, Pretoria.
- Gibbs Russell, G.E. *et. al.* 1990. *Grasses of southern Africa. Memoirs of the Botanical survey of South Africa* No. 58. National Botanic Gardens/Botanical Research Institute, South Africa.
- Gordon-Gray, K.D. 1995. *Cyperaceae in Natal*. *Stelitzia* 2. National Botanical Institute, Pretoria.
- Henderson, L. 2001. *Alien weeds and invasive plants*. Plant Protection Research Institute, Agricultural Research Council, Pretoria.
- Leathart, S. 1977. *Trees of the world*. The Hamlyn Publishing Group, Limited, London.

- Mucina, L. & Rutherford, M.C. 2006. *The vegetation of South Africa, Lesotho and Swaziland. Strelitzia 19*. South African National Biodiversity Institute, Pretoria.
- Pfab, M. 2001. *Red Data Plant Policy for Environmental Impact Evaluations*. Final Draft. Directorate of Nature Conservation, Department of Agriculture, Conservation, Environment and Land Affairs.
- Pfab, M. 2009. *GDACE Requirements for Biodiversity assessments. Version 2*. Directorate of Nature Conservation, Department of Agriculture, Conservation and Environment.
- Pfab, M.F. & Victor, J.E. 2002. Threatened plants of Gauteng, South Africa. *South African Journal of Botany*, Vol 68: 370 – 375.
- Pfab, M.F. 2002. *Priority ranking scheme for Red Data plants in Gauteng, South Africa*. *South African Journal of Botany*, Vol 68: 299 – 303.
- Pooley, E. 1998. *A field guide to the wild flowers of Kwazulu-Natal and the eastern region*. Natal Flora Publications Trust, Durban.
- Raimondo, D., Von Staden, L., Foden, W., Victor, J.E., Helme, N.A., Turner R.C., Kamundi, D.A. & Manyama, P.A. (eds) 2009. *Red list of South African Plants 2009*. *Strelitzia 25*. South African National Biodiversity Institute, Pretoria.
- Smith, C.A. 1986. *Common names of South African plants*. Botanical Research Institute, Department of Agricultural Technical Services, Pretoria.
- Van Oudshoorn, F.P. 2002. *Guide to grasses of southern Africa*. Briza Publications, Pretoria.
- Van Wyk, B. & Malan, S. 1998. *Field guide to the wild flowers of the Highveld*. Struik, Cape Town.
- Van Wyk, B-E., Van Oudtschoorn, B. & Gericke, N. 2002. *Medicinal plants of South Africa*. Briza Publications, Pretoria.
- Watt, J.M. & Breyer-Brandwijk, M.G. 1962. *The medicinal and poisonous plants of southern and eastern Africa*. 2nd edition. Livingstone, London.

ANNEXURE A: Red- and Orange List* plants of the 2527DD q.d.g.c.

Species	Flower season	Suitable habitat	Priority grouping	Conserv status	PRESENCE ON SITE
<i>Bowiea volubilis</i> subsp. <i>volubilis</i>	Sep-Apr	Shady places, steep rocky slopes and in open woodland, under large boulders in bush or low forest.	B	Vulnerable ²	Habitat not suitable
<i>Callilepis leptophylla</i>	Aug-Jan & May	Grassland or open woodland, often on rocky outcrops or rocky hillslopes.	N/A	Declining ²	Habitat not suitable
<i>Cheilanthes deltoidea</i> subsp. <i>nov. Gauteng form</i>	Nov-Jun	Southwest-facing soil pockets and rock crevices in chert rocks.	A2	Vulnerable ¹	Habitat not suitable
<i>Cleome conrathii</i>	Dec-Jan Mar-May	Stony quartzite slopes, usually in red sandy soil, grassland or open to closed deciduous woodland, all aspects.	A3	Near Threatened ¹	Habitat not suitable
<i>Delosperma leendertziae</i>	Oct-Apr	Rocky ridges; on rather steep south facing slopes of quartzite in mountain grassveld.	A2	Near Threatened ¹	Habitat not suitable
<i>Drimys sanguinea</i>	Aug-Dec	Open veld and scrubby woodland in a variety of soil types.	B	Near threatened ²	Habitat not suitable
<i>Eucomis autumnalis</i>	Nov-Apr	Damp open grassland and sheltered places.	N/A	Declining ²	Habitat suitable
<i>Gunnera perpensa</i>	Oct-Mar	In cold or cool continually moist localities, mainly along upland streambanks.	N/A	Declining ²	Habitat not suitable
<i>Habenaria barbertonii</i>	Feb-Mar	In grassland on rocky hillsides.	A2	Near threatened ¹	Habitat not suitable
<i>Habenaria kraenzliniana</i>	Feb-Apr	Terrestrial in stony, grassy hillsides, recorded from 1000 to 1400m.	A3	Near Threatened ¹	Habitat not suitable
<i>Habenaria mossii</i>	Mar-Apr	Open grassland on dolomite or in black sandy soil.	A1	Endangered ¹	Habitat not suitable
<i>Holothrix randii</i>	Sep-Jan	Grassy slopes & rock ledges, usually southern aspects.	B	Near Threatened ²	Habitat not suitable
<i>Hypoxis hemerocallidea</i>	Sep-Mar	Occurs in a wide range of habitats. From sandy hills on margins of dune forests to open rocky grassland. Also on dry, stony grassy slopes, mountain slopes and plateaux. Appears to be drought and fire tolerant. Grassland and mixed woodland.	N/A	Declining ²	FOUND
<i>Ilex mitis</i> var. <i>mitis</i>	Oct-Dec	River banks, stream beds, evergreen forests.	N/A	Declining ²	Habitat not suitable
<i>Melolobium subspicatum</i>	Sep-May	Grassland.	A1	Vulnerable ¹	Habitat not suitable
<i>Prunus africana</i>	Dec-Jun	Forests, bushveld.	B	Vulnerable ²	Habitat not suitable

¹ global status

² national status

* Orange listed plants have no priority grouping and are designated 'N/A'

Stephan Barkhuizen

From: Ontvangs
Sent: 23 May 2011 10:22 AM
To: Mientjie Coetzee; Stephan Barkhuizen
Subject: FW: Nietgedacht mammal, herpetofauna en avifauna verslae
Attachments: Nietgedacht ptns 27 & 73 - App B Mammals.pdf; Nietgedacht ptns 27 & 73 - App C Avifauna Final.pdf; Nietgedacht ptns 27 & 73 - App D Herpetofauna.pdf

From: Vanessa Marais [mailto:vanessam@lantic.net]
Sent: 21 May 2011 10:43 AM
To: 'Lizelle Gregory'
Subject: Nietgedacht mammal, herpetofauna en avifauna verslae

Hi Mientjie / Stephan

Aangeheg die 3 fauna verslae vir Nietgedacht. Julle behoort nou al 5 verslae te hê.

Groete

Vanessa Marais
Galago Environmental CC
638 Turf Street, Wingate Park, 0181
Tel: 012-345 4891
Fax: 086 675 6136
Cell: 082 322 5688

APPENDIX B: MAMMAL REPORT

ANNEXURE D1ii:

AVIFAUNA ASSESSMENT

GALAGO ENVIRONMENTAL



Fauna and Flora Specialists

638 Turf St

Wingate Park, 0181

Tel: 012-345 4891

Fax: 086 675 6136

Email: Vanessam@lantic.net

Avifauna Assessment

of

**PORTIONS 27 & 73 OF THE FARM
NIETGEDACHT 535 JQ**

April 2011

Report edited by:

Report author:

Report verified/reviewed by:

Ms. Vanessa Marais of Galago Environmental

Mr. R.F. Geyser

Dr. A.C. Kemp (Ph.D., Pr.Sci. Nat. (Zoology & Ecology))

VERIFICATION STATEMENT

Mr R. Geyser is not registered as a Professional Natural Scientist with the S.A. Council for Natural Scientific Professions. This statement serves to verify that the bird report compiled by Mr R.F. Geyser has been prepared under my supervision, and I have verified the contents thereof.

Declaration of Independence: I, Alan Charles Kemp (4405075033081), declare that I:

- am committed to biodiversity conservation but concomitantly recognize the need for economic development. Whereas I appreciate the opportunity to also learn through the processes of constructive criticism and debate, I reserve the right to form and hold my own opinions and therefore will not willingly submit to the interests of other parties or change my statements to appease them
- abide by the Code of Ethics of the S.A. Council for Natural Scientific Professions
- act as an independent specialist consultant in the field of zoology
- am subcontracted as specialist consultant by Galago Environmental CC for the proposed development of Portions 27 & 73 of Nietgedacht as described in this report
- have no financial interest in the proposed development other than remuneration for work performed
- neither have nor will have any vested or conflicting interests in the proposed development
- undertake to disclose to Galago Environmental CC and its client, and the competent authority, any material information that has or may have the potential to influence decisions by the competent authority as required in terms of the Environmental Impact Assessment Regulations 2006



A.C. Kemp

TABLE OF CONTENTS

1. INTRODUCTION	4
2. SCOPE AND OBJECTIVES OF THE STUDY	4
3. STUDY AREA	4
4. METHODS	5
5. RESULTS	7
6. FINDINGS AND POTENTIAL IMPLICATIONS	19
7. LIMITATIONS, ASSUMPTIONS AND GAPS IN KNOWLEDGE	19
8. RECOMMENDED MITIGATION MEASURES	19
9. CONCLUSION	20
10. LITERATURE SOURCES	21

FIGURES:

Figure 1: Locality map of the study area	5
Figure 2: Bird habitat systems identified from the study site.	7
Figure 3: View of the open disturbed grassland	8
Figure 4: View of the <i>Hyparrhenia hirta</i> dominated grassland	8
Figure 5: View of derelict buildings surrounded by weeds	9
Figure 6: View of exotic trees and disturbed grassland	10
Figure 7: Avifaunal sensitivity map of the site	20

TABLES:

Table 1: Bird species observed and that are likely to occur on the study site.	11
Table 2: Red Data bird species recorded for the 2527DD q.d.g.c.	13
Table 3: Red Data bird species assessment for the 2527DD q.d.g.c.	15

1. INTRODUCTION

Galago Environmental CC. was appointed to undertake an avifaunal habitat survey for Portions 27 and 73 of the farm Nietgedacht 535 JQ (hereafter known as the study site), which is proposed for residential development.

This report focuses on the current status of Red Data or Near Threatened species likely to occur on the proposed development site, and suggests measures for mitigation should development be approved.

2. SCOPE AND OBJECTIVES OF THE STUDY

- To qualitatively and quantitatively assess the significance of the avifaunal habitat components, and current general conservation status of the property;
- To comment on ecologically sensitive areas;
- To comment on connectivity with natural vegetation and habitats on adjacent sites;
- To provide a list of birds that occur or might occur, and to identify species of conservation importance;
- To highlight potential impacts of the proposed development on the avifauna of the study site, and
- To provide management recommendations to mitigate negative and enhance positive impacts should the proposed development be approved.

3. STUDY AREA

The study site, 30.40 ha in extent, is situated within the 2527DD quarter degree grid cell (q.d.g.c.) and within the 2555_2755 pentad, Gauteng Province. The R552 Fourways/Lanseria road borders the study site to the east and the N14 forms the southern boundary (25°58'14.6" S 27°56'21.8" E). The site is situated at an altitude of about 1 400 metres above sea level (m a.s.l.) and slopes downwards to the northwest.

The largest portion of the study site consists of old lands or fallow fields now predominantly overgrown by grasses and weeds with scattered trees and a small and insignificant drainage line (with regards to avifauna) that cuts through the middle of the property. The rest of the area is disturbed and consists of old buildings surrounded by exotic trees, weeds and grass.

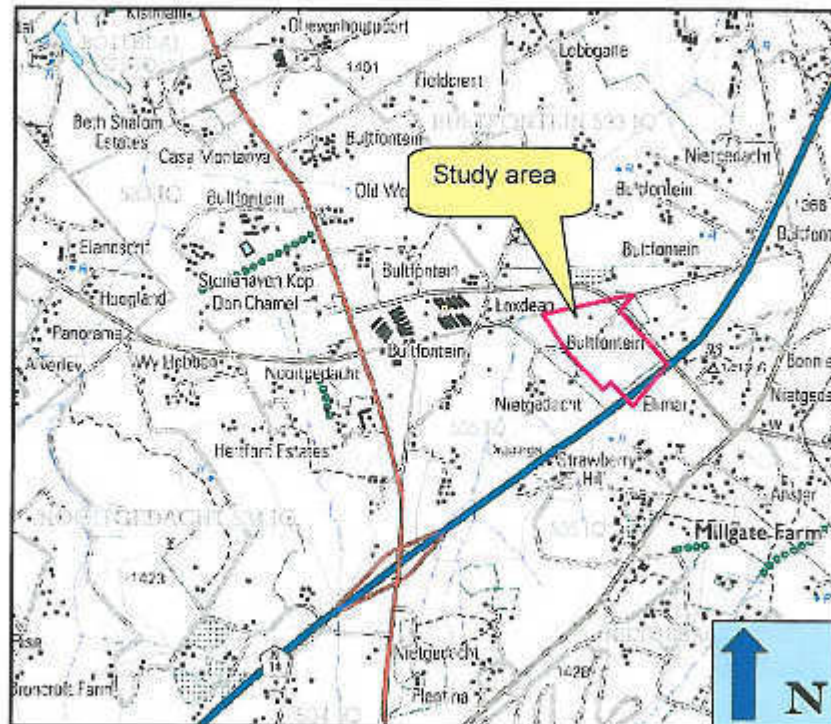


Figure 1: Locality map of the study area

4. METHODS

The site visit was conducted on 26 February 2011. During the eight-hour visit the observed and derived presence of avifauna associated with the recognised habitat types of the study site, were recorded. This was done with due regard to the known distributions of Southern African avifauna.

4.1 Field Surveys

Birds were identified visually, using 10X42 Bushnell Legend binoculars and a 20X-60X Pentax spotting scope, and by call, and where necessary were verified from *Sasol Birds of Southern Africa* (Sinclair *et al.*, 2005) and *Southern African Bird Sounds* (Gibbon, 1991).

The 500 m of adjoining properties was scanned for important animal species and avifaunal habitats.

During the site visit, birds were identified by visual sightings or aural records along random transect walks. No trapping or mist netting was conducted, since the terms of reference did not require such intensive work. In addition, birds were also identified by means of feathers, nests, signs, droppings, burrows or roosting sites. Locals were interviewed to confirm occurrences or absences of species.

4.2 Desktop Surveys

The presence of suitable habitats was used to deduce the likelihood of presence or absence of species, based on authoritative tomes, scientific literature, field guides, atlases and databases. This can be done irrespective of season.

The likely occurrence of key bird species was verified according to distribution records obtained during the Southern African Bird Atlas Project 1 (SABAP1) period from 1981 to

1993 (Harrison *et al.* 1997). Earlier records of Red Data species only were obtained from the period between 1974 and 1987 according to Tarboton *et al.* (1987) and the most recent data from the current SABAP2 project which started on 1 July 2007.

The occurrence and historic distribution of likely avifaunal species, especially all Red Data avifaunal species recorded for the q.d.g.c. 2527DD, were verified from Harrison *et al.* (1997), Tarboton *et al.* (1987) and the current SABAP2 project. The reporting rate for each avifaunal species likely to occur on the study site, based on Harrison *et al.* (1997), was scored between 0 – 100% and was calculated as follows: Total number of cards on which a species was reported during the Southern African Bird Atlas SABAP1 and the current SABAP2 project period X 100 ÷ total number of cards for the particular q.d.g.c. (Harrison *et al.*, 1997) and pentad(s) (SABAP2). It is important to note that a q.d.g.c. (SABAP1 Protocol) covers a large area: for example, q.d.g.c. 2527DD covers an area of $\pm 27 \times 25$ km (± 693 km²) (15 minutes of latitude by 15 minutes of longitude, 15' x 15') and a pentad (SABAP2 Protocol) and area of $\pm 8 \times 7.6$ km (5 minutes of latitude by 5 minutes of longitude, 5' x 5') and it is possible that suitable habitat will exist for a certain Red Data avifaunal species within this wider area surrounding the study site. However, the specific habitat(s) found on site may not suit the particular Red Data species, even though it has been recorded for the q.d.g.c or pentad. For example, the Cape Vulture occurs along the Magaliesberg but will not favour the habitat found within the Pretoria CBD, both of which are in the same q.d.g.c. Red Data bird species were selected and categorised according to Barnes (2000).

A biodiversity index, that gives an indication of which habitat system on the study site will hold the richest bird diversity, was calculated as the sum of the probability of occurrence of bird species within a specific habitat system on site. For each species and habitat, the probability of occurrence was ranked as: 5 = present on site, 4 = not observed on site but has a high probability of occurring there, 3 = medium probability, 2 = low probability, 1 = very low probability and 0 = not likely to occur.

4.3 Specific Requirements

During the site visit, the study site was surveyed visually and its habitats assessed for the potential occurrence of priority Red Data avifauna, according to GDARD's requirement for Biodiversity Assessments, Version 2 (2009), as well as for any other Red Data bird species. The priority Red Data bird species for Gauteng are (in Roberts VII order and nomenclature, Hockey *et al.* 2005):

- Half-collared Kingfisher (*Alcedo semitorquata*)
- African Grass-Owl (*Tyto capensis*)
- White-bellied Korhaan (*Eupodotis senegalensis*)
- Blue Crane (*Anthropoides paradiseus*)
- African Finfoot (*Podica senegalensis*)
- Cape Vulture (*Gyps coprotheres*)
- African Marsh-Harrier (*Circus ranivorus*)
- Martial Eagle (*Polemaetus bellicosus*)
- Secretarybird (*Sagittarius serpentarius*)
- Lesser Kestrel (*Falco naumanni*)
- Greater Flamingo (*Phoenicopterus ruber*)
- Lesser Flamingo (*Phoenicopterus minor*)
- White-backed Night-Heron (*Gorsachius leuconotus*)
- Black Stork (*Ciconia nigra*)

No particular reference was made to the possible occurrence of any Red Data avifaunal species on or surrounding the study site.

5. RESULTS

Avifaunal Habitat Assessment:

Two major bird habitat systems were identified on the study site within the Egoli Granite Grassland vegetation type (Mucina and Rutherford, 2006). A short description of each habitat type follows, ranked from most to least important (refer to figure 2):

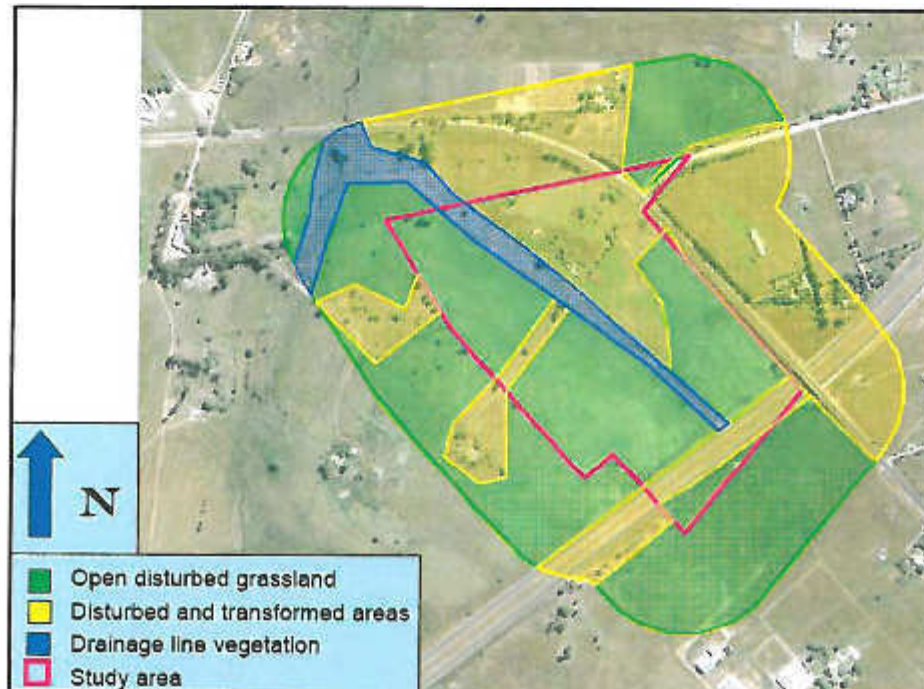


Figure 2: Bird habitat systems identified from the study site.

Open disturbed grassland:

The study site is situated within the Mesic Highveld Grassland Bioregion of the Grassland Biome and more specifically within the Egoli Granite Grassland (Gm 10) 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 rocky habitat shows a high diversity of woody species, which occur in the form of scattered shrub groups or solitary small trees (Mucina and Rutherford, 2006).



Figure 3: View of the open disturbed grassland showing patches of kikuyu lawn invading the natural grassland

Little natural vegetation exists and the grassland is disturbed through past agricultural activities and is now overgrown with predominantly *Eragrostis/Hypparhenia* grass. The drainage line vegetation does not differ significantly from the adjacent grassland in terms of avifauna habitat and forms part of the open disturbed grassland for the purposes of this report.



Figure 4: View of the *Hyparrhenia hirta* dominated grassland

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. The habitat favours ground-living bird species, such as lapwings, francolins, pipits, longclaws, larks and chats. These birds hunt for insects and/or breed on the ground, in burrows in the ground, or between the grasses. Weavers and

widowbirds make use of such habitat for feeding on ripe seeds during late summer and early winter when the grass is not burnt, and widowbirds and cisticolas will also breed in the tall grass during summer. Species such as weavers and bishops that breed in the wetland habitat during summer will also make use of the open grassland habitat for feeding during winter after the grasses have seeded. Aerial feeding birds such as martins, swifts and swallows will also hunt for insects over the grasslands.

Suburban, rural gardens smallholdings and transformed areas:

The remainder of the study site is disturbed through past and present human activities and consists of old building surrounded by exotic trees and weeds.



Figure 5: View of derelict buildings surrounded by weeds

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 largely are 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.



Figure 6: View of exotic trees and disturbed grassland

Observed and Expected Species Richness

Of the 359 bird species recorded for the 2527DD q.d.g.c. (Harrison *et al.*, 1997), 100 (27.8 %) are likely to occur on the study site and 40 (40 %) of these bird species were actually observed on and surrounding the study site.

Woodland avifaunal species that are able to adapt to areas changed by man dominated the species composition of the birds observed during the survey marginally followed by the more common grassland avifaunal species.

Our biodiversity index indicates that the largest bird diversity is likely to occur within the transformed and disturbed area and old garden habitat system on site, with a biodiversity index (BI) of 320, followed by the open disturbed grassland (BI 315).

The bird species listed in Table 1 are in the species order according to *Roberts - Birds of Southern Africa* VIIth edition (Hockey *et al.*, 2005). These comprise the 40 species actually observed on site (**in bold**) or likely to occur within the specific habitat(s) found on site. This does not include overflying birds or rare vagrants. The reporting rate for each species is the percentage for the q.d.g.c. according to the SABAP 1 atlas (Harrison *et al.* 1997) and is represented by colour codes as follows: Yellow = Very Low, Light Orange = Low, Dark Orange = Medium and Red = High. Our habitat preference scores for each species are shown under the recognised habitat types on site: **OG = Open Grassland** and **SG = Suburban Gardens, disturbed and transformed**, with their possibility of occurrence in these specific habitats rated as 5 = present, 4 = High, 3 = Medium, 2 = Low, 1 = Very low, and 0 = Not likely to occur.

Table 1: Bird species observed and that are likely to occur on the study site.

SCIENTIFIC NAME	ENGLISH NAME	R RATE (%) [*]	Habitat preference	
		2527DD	OG	SG
<i>Peliperdix coqui</i>	Coqui Francolin	39	2	0
<i>Pternistis swainsonii</i>	Swainson's Spurfowl	56	4	3
<i>Numida meleagris</i>	Helmeted Guineafowl	79	4	4
<i>Indicator minor</i>	Lesser Honeyguide	6	0	3
<i>Jynx ruficollis</i>	Red-throated Wryneck	18	3	4
<i>Dendropicos fuscescens</i>	Cardinal Woodpecker	10	0	2
<i>Tricholaema leucomelas</i>	Acacia Pied Barbet	14	1	2
<i>Lybius torquatus</i>	Black-collared Barbet	73	2	4
<i>Trachyphonus vaillantii</i>	Crested Barbet	82	2	4
<i>Tockus nasutus</i>	African Grey Hornbill	28	1	2
<i>Upupa africana</i>	African Hoopoe	48	2	4
<i>Phoeniculus purpureus</i>	Green Wood-Hoopoe	53	1	3
<i>Halcyon albiventris</i>	Brown-hooded Kingfisher	44	2	3
<i>Merops albicollis</i>	White-throated Bee-eater	7	2	1
<i>Merops apiaster</i>	European Bee-eater	21	5	3
<i>Colius striatus</i>	Speckled Mousebird	71	3	5
<i>Urocolius indicus</i>	Red-faced Mousebird	34	4	4
<i>Chrysococcyx caprius</i>	Diderick Cuckoo	28	4	4
<i>Centropus burchellii</i>	Burchell's Coucal	38	0	2
<i>Cypsiurus parvus</i>	African Palm-Swift	9	5	4
<i>Apus affinis</i>	Little Swift	31	4	4
<i>Apus caffer</i>	White-rumped Swift	21	4	4
<i>Corythaixoides concolor</i>	Grey Go-away-bird	68	2	3
<i>Tyto alba</i>	Barn Owl	26	3	3
<i>Bubo africanus</i>	Spotted Eagle-Owl	14	2	2
<i>Columba livia</i>	Rock Dove	12	2	3
<i>Columba guinea</i>	Speckled Pigeon	57	4	5
<i>Streptopelia senegalensis</i>	Laughing Dove	94	5	5
<i>Streptopelia capicola</i>	Cape Turtle-Dove	75	4	4
<i>Streptopelia semitorquata</i>	Red-eyed Dove	48	5	5
<i>Burhinus capensis</i>	Spotted Thick-knee	45	4	3
<i>Vanellus armatus</i>	Blacksmith Lapwing	71	5	2
<i>Vanellus senegallus</i>	African Wattled Lapwing	45	4	0
<i>Vanellus coronatus</i>	Crowned Lapwing	80	4	3
<i>Elanus caeruleus</i>	Black-shouldered Kite	72	4	3
<i>Milvus migrans</i>	Black Kite	9	2	2
<i>Accipiter minullus</i>	Little Sparrowhawk	11	0	2
<i>Buteo vulpinus</i>	Steppe Buzzard	11	5	2
<i>Ardea melanocephala</i>	Black-headed Heron	45	4	2
<i>Bubulcus ibis</i>	Cattle Egret	83	5	2
<i>Bostrychia hagedash</i>	Hadedda Ibis	88	4	5
<i>Threskiornis aethiopicus</i>	African Sacred Ibis	58	5	0
<i>Dicrurus adsimilis</i>	Fork-tailed Drongo	46	0	2
<i>Terpsiphone viridis</i>	African Paradise-Flycatcher	34	0	4
<i>Dryoscopus cubla</i>	Black-backed Puffback	35	0	3
<i>Tchagra senegalus</i>	Black-crowned Tchagra	36	0	2
<i>Laniarius ferrugineus</i>	Southern Boubou	43	0	2
<i>Telophorus zeylonus</i>	Bokmakierie	47	4	4

SCIENTIFIC NAME	ENGLISH NAME	R RATE (%) ^a	Habitat preference	
		2527DD	OG	SG
<i>Corvus albus</i>	Pied Crow	76	5	3
<i>Lanius collaris</i>	Common Fiscal	93	5	4
<i>Hirundo rustica</i>	Barn Swallow	37	5	5
<i>Hirundo albigularis</i>	White-throated Swallow	29	5	4
<i>Hirundo cucullata</i>	Greater Striped Swallow	40	5	5
<i>Hirundo abyssinica</i>	Lesser Striped Swallow	39	4	4
<i>Hirundo spilodera</i>	South African Cliff-Swallow	8	5	2
<i>Pycnonotus tricolor</i>	Dark-capped Bulbul	91	4	5
<i>Phylloscopus trochilus</i>	Willow Warbler	13	1	4
<i>Zosterops virens</i>	Cape White-eye	78	1	4
<i>Cisticola tinniens</i>	Levaillant's Cisticola	22	5	1
<i>Cisticola fulvicapilla</i>	Neddicky	40	3	4
<i>Cisticola juncidis</i>	Zitting Cisticola	18	5	2
<i>Cisticola aridulus</i>	Desert Cisticola	9	5	0
<i>Cisticola textrix</i>	Cloud Cisticola	6	3	0
<i>Prinia subflava</i>	Tawny-flanked Prinia	52	5	5
<i>Prinia flavicans</i>	Black-chested Prinia	28	5	4
<i>Mirafra africana</i>	Rufous-naped Lark	36	5	0
<i>Turdus libonyanus</i>	Kurichane Thrush	38	0	3
<i>Turdus smithi</i>	Karoo Thrush	51	0	4
<i>Sigelus silens</i>	Fiscal Flycatcher	52	1	3
<i>Muscicapa striata</i>	Spotted Flycatcher	12	1	4
<i>Cossypha caffra</i>	Cape Robin-Chat	64	2	4
<i>Saxicola torquatus</i>	African Stonechat	41	5	4
<i>Lamprotornis nitens</i>	Cape Glossy Starling	46	3	5
<i>Acridotheres tristis</i>	Common Myna (INT)	29	4	5
<i>Chalcomitra amethystina</i>	Amethyst Sunbird	60	2	5
<i>Cinnyris talatala</i>	White-bellied Sunbird	33	1	3
<i>Ploceus capensis</i>	Cape Weaver	14	2	2
<i>Ploceus velatus</i>	Southern Masked-Weaver	82	5	5
<i>Quelea quelea</i>	Red-billed Quelea	9	4	4
<i>Euplectes afer</i>	Yellow-crowned Bishop	7	5	2
<i>Euplectes orix</i>	Southern Red Bishop	48	5	4
<i>Euplectes albonotatus</i>	White-winged Widowbird	26	5	5
<i>Euplectes ardens</i>	Red-collared Widowbird	24	5	4
<i>Euplectes progne</i>	Long-tailed Widowbird	39	5	2
<i>Sporaeoginthus subflavus</i>	Orange-breasted Waxbill	9	4	3
<i>Ortygospiza atricollis</i>	African Quailfinch	10	4	2
<i>Amadina erythrocephala</i>	Red-headed Finch	2	3	4
<i>Estrilda astrild</i>	Common Waxbill	23	5	4
<i>Lagonosticta rhodopareia</i>	Jameson's Firefinch	3	2	3
<i>Spermestes cucullatus</i>	Bronze Mannikin	19	4	4
<i>Vidua macroura</i>	Pin-tailed Whydah	31	4	4
<i>Passer domesticus</i>	House Sparrow	55	0	3
<i>Passer melanurus</i>	Cape Sparrow	74	4	5
<i>Passer diffusus</i>	Southern Grey-headed Sparrow	57	5	5
<i>Motacilla capensis</i>	Cape Wagtail	62	2	5
<i>Macronyx capensis</i>	Cape Longclaw	34	5	2
<i>Anthus cinnamomeus</i>	African Pipit	22	5	2

SCIENTIFIC NAME	ENGLISH NAME	R RATE (%) [*]	Habitat preference	
		2527DD	OG	SG
<i>Crithagra mozambicus</i>	Yellow-fronted Canary	40	1	2
<i>Crithagra atrogularis</i>	Black-throated Canary	45	4	4
<i>Crithagra gularis</i>	Streaky-headed Seedeater	19	0	2
Biodiversity Index:			315	320

^{*}The reporting rate is calculated as follows: Total number of cards on which a species was reported X 100 ÷ total number of cards for a particular quarter degree grid cell. INT = Introduced or alien birds species to Southern Africa.

Red Data Species Categories for the birds (Barnes, 2000)

RE = Regionally extinct, **CR** = Critically Endangered **EN** = Endangered, **VU** = Vulnerable, **NT** = Near-threatened.

The biodiversity index gives an indication of which habitat will hold the richest bird diversity on site. The colour codes for each species are represented as follows: Yellow = Very Low, Light Orange = Low, Dark Orange = Medium and Red = High. The likelihood of occurrence of each species on site in the specific habitat systems are as follow: 5 = present, 4 = High, 3 = Medium, 2 = Low, 1 = very low, and 0 = Not likely to occur.

Threatened and Red Listed Bird Species

The following Red Data bird species were recorded for the 2527DD (Broederstroom) q.d.g.c according to Harrison *et al.* (1997) and Tarboton *et al* (1987) (Table 2).

Table 2: Red Data bird species recorded for the 2527DD q.d.g.c.

SCIENTIFIC NAME	ENGLISH NAME	REPORTING RATE (%) [*]
		SABAP1/SABAP2
<i>Alcedo semitorquata</i>	Half-collared Kingfisher (NT)	2/4.7(T)
<i>Tyto capensis</i>	African Grass-Owl (VU)	4/0(Tb)
<i>Eupodotis senegalensis</i>	White-bellied Korhaan (VU)	2/0(T)
<i>Anthropoides paradiseus</i>	Blue Crane (VU)	2/0(Tb)
<i>Podica senegalensis</i>	African Finfoot (VU)	<1/0.5(T)
<i>Rostratula benghalensis</i>	Greater Painted-snipe (NT)	<1/0
<i>Rynchops flavirostris</i>	African Skimmer (RE)	0/0(T)
<i>Sterna caspia</i>	Caspian Tern (NT)	<1/0.5
<i>Gyps africanus</i>	White-backed Vulture (VU)	3/0(T)
<i>Gyps coprotheres</i>	Cape Vulture (VU)	34/0.5(Tb)
<i>Terathopus ecaudatus</i>	Bateleur (VU)	0/0(T)
<i>Circus ranivorus</i>	African Marsh-Harrier (VU)	2/0.5(T)
<i>Circus macrourus</i>	Pallid Harrier (NT)	0/0(T)
<i>Polemaetus bellicosus</i>	Martial Eagle (VU)	1/0(Tb)
<i>Sagittarius serpentarius</i>	Secretarybird (NT)	3/0(Tb)
<i>Falco naumanni</i>	Lesser Kestrel (VU)	1/0.9(T)
<i>Falco biarmicus</i>	Lanner Falcon (NT)	3/2.3(Tb)
<i>Falco peregrinus</i>	Peregrine Falcon (NT)	<1/0(T)
<i>Gorsachius leuconotus</i>	White-backed Night-Heron (VU)	0/0(Tb)
<i>Phoenicopterus ruber</i>	Greater Flamingo (NT)	0/0(T)
<i>Phoenicopterus minor</i>	Lesser Flamingo (NT)	0/0(T)
<i>Mycteria ibis</i>	Yellow-billed Stork (NT)	1/0(T)
<i>Anastomus lamelligerus</i>	African Openbill (NT)	0/0.5(T)
<i>Ciconia nigra</i>	Black Stork (NT)	1/0.5(Tb)
<i>Leptoptilos crumeniferus</i>	Marabou Stork (NT)	<1/0
<i>Mirafraga cheniana</i>	Melodious Lark (NT)	1/1.4(T)

SCIENTIFIC NAME	ENGLISH NAME	REPORTING RATE (%) [*]
		SABAP1/SABAP2
<i>Buphagus erythrorhynchus</i>	Red-billed Oxpecker (NT)	0/0(T)
	SABAP1 Very Low :	13
	SABAP1 Low :	5
	SABAP1 Medium :	0
	SABAP1 High :	1
	SABAP1 TOTAL :	19
	Tarboton <i>et al</i> present :	16
	Tarboton <i>et al</i> breeding:	8
	Tarboton <i>et al</i> TOTAL:	24
	SABAP2:	10

*The reporting rate is calculated as follows: Total number of cards on which a species was reported X 100 ÷ total number of cards for a particular quarter degree grid cell. T = Bird species recorded as present (light blue) and Tb = bird species recording as breeding (dark blue) for the q.d.g.c. according to Tarboton (1987). Bird species with both reporting rates and T or Tb were recorded for the q.d.g.c. according to both Harrison *et al.* (1997) and Tarboton *et al.* (1987). The colour codes for each species are represented as follows: yellow = very low, light orange = low, dark orange = medium and red = high with reference to the specific habitat systems found on site.

Red Data Species Categories for the birds (Barnes, 2000)

RE = Regionally extinct, **CR** = Critically Endangered **EN** = Endangered, **VU** = Vulnerable, **NT** = Near-threatened.

A total of 27 Red Data avifaunal species have been recorded within the 2527DD q.d.g.c. (Table 2). Eight of these appear to have disappeared from the area or were not recorded for this q.d.g.c. 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 (SABA1). Most of the Red Data species that have been recorded indicate a low to very low reporting rate. The Cape Vulture indicates a medium 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. Ten of the above-mentioned Red Data avifaunal species that have been recorded for the 2555_2755 pentad are indicated in bold above. Most if not all of these birds have been recorded from Northern Farm (Diepsloot Nature Reserve) to the north east of the study site.

Summary of the Red Data bird species

Table 3 provides a list of the Red Data bird species recorded for the 2527DD q.d.g.c. according to Harrison *et al.* (1997) and an indication of their likelihood of occurrence on the study site based on habitat and food availability.

Table 3: Red Data bird species assessment for the 2527DD q.d.g.c.

SCIENTIFIC NAME	PRESENCE OF SUITABLE HABITAT AND HABITAT REQUIREMENTS	LIKELIHOOD OF OCCURRENCE ON STUDY SITE
<i>Alcedo semitorquata</i> * (Half-collared Kingfisher) (NT)	None on site: Requires fast-flowing streams, rivers and estuaries, usually with dense marginal vegetation (Maclean, 1993), especially perennial streams and smaller rivers with overhanging riparian vegetation on their banks. Nests in sand/earth banks (Tarboton <i>et al.</i> , 1987) and requires riverbanks in which to excavate nest tunnels (Harrison <i>et al.</i> , 1997). Most typically occurs along fast-flowing streams with clear water and well-wooded riparian growth, often near rapids. It most frequently favours broken escarpment terrain and requires at least 1 km up and down stream of undisturbed river and riparian vegetation while breeding. It occurs from sea-level to 2000 m.a.s.l. in southern Africa. Usually perches low down on the banks of rivers and streams, often on exposed roots, as well as exposed rock and low overhanging tree branches.	<u>Highly Unlikely</u> Due to a lack of suitable breeding and foraging habitat. Uncommon and easily overlooked; quiet streams (Marais & Peacock, 2008).
<i>Tyto capensis</i> * (African Grass-Owl) (VU)	None on site: Occurs predominately in rank grass, typically but not always at fairly high altitudes. Breeds mainly in permanent and seasonal vleis, which it vacates while hunting or during post-breeding although it will sometimes breed in any area of long grass, sedges or even weeds (Van Rooyen, pers. comm.) and not necessarily associated with wetlands (Tarboton <i>et al.</i> , 1987) although this is more the exception than the rule. Foraging mainly confined to tall grassland next to their wetland vegetation and rarely hunts in short grassland, wetlands or croplands nearby (Barnes, 2000). Mainly restricted to wet areas (marshes and vleis) where tall dense grass and/or sedges occur. Prefers permanent or seasonal vleis and vacates the latter when these dry up or are burnt. Roosts and breeds in vleis but often hunt elsewhere e.g. old lands and disturbed grassland although these are suboptimal habitat conditions (Tarboton <i>et al.</i> , 1987). May rarely occur in sparse <i>Acacia</i> woodland where patches of dense grass cover are present (Harrison <i>et al.</i> , 1997).	<u>Highly unlikely</u> No suitable breeding, roosting and foraging habitat were identified on and surrounding the study site.
<i>Eupodotis senegalensis</i> * (White-bellied Korhaan) (VU)	None on site: Occurs in fairly tall, dense grassland, especially sour and mixed grassland, in open or lightly wooded, undulating to hilly country. In winter, occasionally on modified pastures and burnt ground (Harrison <i>et al.</i> , 1997).	<u>Highly unlikely</u> Due to high human presence on site and disturbance surrounding the study site. Scarce in Gauteng and secretive resident; widespread (Marais & Peacock, 2008).

SCIENTIFIC NAME	PRESENCE OF SUITABLE HABITAT AND HABITAT REQUIREMENTS	LIKELIHOOD OF OCCURRENCE ON STUDY SITE
<i>Anthropoides paradiseus</i> * (Blue Crane) (VU)	None on site: Midlands and highland grassland, edge of Karoo, cultivated land and edges of vleis (Maclean, 1993). Nests in both moist situations in vleis which have short grass cover and in dry sites far from water, usually exposed places such as on hillsides; forages in grassland and cultivated and fallow lands; roosts communally in the shallow water of pans and dams (Tarboton <i>et al.</i> , 1987). Short dry grassland, being more abundant and evenly disturbed in the eastern "sour" grassland, where natural grazing of livestock is the predominant land use. Prefers to nest in areas of open grassland (Barnes, 2000) In the Fynbos biome it inhabits cereal croplands, cultivated pastures and avoids natural vegetation. By contrast, it is found in natural vegetation in the Karoo and grassland biomes, but it also feeds in crop fields (Harrison <i>et al.</i> , 1997).	<u>Highly unlikely</u> Due to the small extent of the grassland, disturbance surrounding the study site and high human presence on the study site. Localised but common in the south-eastern Gauteng (Marais & Peacock, 2008).
<i>Podica senegalensis</i> * (African Finfoot) (VU)	None on site: Occurs mostly along quiet, wooded streams and rivers flanked by thick riparian vegetation and overhanging trees. Also dam verges, especially where there is sufficient overhanging vegetation and reed cover. Avoids both stagnant and very fast-flowing watercourses, with a preference for clear, rather than silted water (Hockey <i>et al.</i> , 2005).	<u>Highly unlikely</u> Due to a lack of suitable breeding and foraging habitat, high human presence on site and disturbance surrounding the study site. Scarce in Gauteng and secretive resident; widespread (Marais & Peacock, 2008).
<i>Rostratula benghalensis</i> (Greater Painted-snipe) (NT)	None on site: Dams, pans and marshy river flood plains. Favours waterside habitat with substantial cover and receding water levels with exposed mud among vegetation, departing when water recedes beyond the fringes of vegetation. Rare in seasonally flooded grassland and palm savanna (Hockey <i>et al.</i> , 2005).	<u>Highly unlikely</u> Due to a lack of suitable foraging habitat. Uncommon visitor and resident (Marais & Peacock, 2008).
<i>Sterna caspia</i> (Caspian Tern) (NT)	None on site: Occurs along coast, mostly in sheltered bays and estuaries. Inland, at large water bodies, both natural and man-made, with preference for saline pans and large impoundments. Coastal breeding habitat primarily offshore islands, but with increasing use of sandy beaches and islands in saltworks, where protection is offered. Inland, breeds on small, low islets in pans and dams (Hockey <i>et al.</i> , 2005).	<u>Highly unlikely</u> Due to a lack of suitable foraging and breeding habitat. Non-breeding winter visitor to large water bodies in Gauteng (Marais & Peacock, 2008).
<i>Gyps africanus</i> (White-backed Vulture) (VU)	None on site: Their presence is dependent on the availability of food. Lightly wooded arid savanna, including Mopane <i>Colophospermum mopane</i> woodland; but absent from forest, true deserts, and the treeless grass- and shrubland of the south and central Karoo (Hockey <i>et al.</i> , 2005).	<u>Highly unlikely</u> Due to a lack of suitable foraging and breeding habitat. ... (Marais & Peacock, 2008)

SCIENTIFIC NAME	PRESENCE OF SUITABLE HABITAT AND HABITAT REQUIREMENTS	LIKELIHOOD OF OCCURRENCE ON STUDY SITE
<i>Gyps coprotheres</i> * (Cape Vulture) (VU)	They mostly occur in mountainous country, or open country with inselbergs and escarpments; less commonly as visitors to savannah or desert (Maclean, 1993). Forage over open grassland, woodland and agricultural areas; usually roosts on cliffs, but will also roost on trees and pylons (Barnes, 2000). It is reliant on tall cliffs for breeding but it wanders widely away from these when foraging. It occurs and breeds from sea level to 3 100 m.a.s.l. Current distribution is closely associated with subsistence communal grazing areas characterised by high stock losses and low use of poisons and, to a lesser extent, with protected areas (Harrison <i>et al.</i> , 1997), but their presence is ultimately dependent on the availability of food.	<u>Highly unlikely</u> Due to a lack of suitable foraging and breeding habitat. Breeds in Magaliesberg; uncommon wanderer elsewhere; mostly SW & NW Gauteng (Marais & Peacock, 2008).
<i>Circus ranivorus</i> * (African Marsh-Harrier) (VU)	None on site: Almost exclusively inland and coastal wetlands (Hockey <i>et al.</i> , 2005). Wetland and surrounding grasslands. Most Highveld wetlands > 100 ha support a breeding pair (Tarboton & Allan, 1984). Nests in extensive reed beds often high above water. Forages over reeds, lake margins, floodplains and occasionally even woodland. Almost entirely absent from areas below 300 mm of rainfall (Harrison <i>et al.</i> , 1997). Marsh, vlei, grassland (usually near water); may hunt over grassland, cultivated lands and open savanna (Maclean, 1993). Dependant on wetlands, particularly permanent wetlands for breeding, roosting and feeding. May utilise small wetlands 1-2 ha in extent for foraging, but larger wetlands are required for breeding (Barnes, 2000).	<u>Highly unlikely</u> There are no suitable foraging, breeding or roosting habitat for this species on the study site. Declining resident of large vleis, occurs mainly in south-eastern Gauteng (Marais & Peacock, 2008).
<i>Polemaetus bellicosus</i> * (Martial Eagle) (VU)	None on site: Tolerates a wide range of vegetation types, being found in open grassland, scrub, Karoo, agricultural lands and woodland. It relies on large trees (or electricity pylons) to provide nest sites (Barnes, 2000) as well as windmills and even cliffs in treeless areas. It occurs mainly in flat country and is rarer in mountains, and it also avoids extreme desert, and densely wooded and forested areas (Harrison <i>et al.</i> , 1997 & Barnes, 2000).	<u>Highly unlikely</u> Due to a lack of suitable habitat and disturbance cause by the large scale development surrounding the study site. Uncommon local resident (Marais & Peacock, 2008).
<i>Sagittarius serpentarius</i> * (Secretarybird) (NT)	None on site: Open grassland with scattered trees, shrubland, open <i>Acacia</i> and <i>Combretum</i> savanna (Hockey <i>et al.</i> , 2005). Restricted to large conservation areas in the region. Avoids densely wooded areas, rocky hills and mountainous areas (Hockey <i>et al.</i> , 2005 & Barnes, 2000). Requires small to medium-sized trees with a flat crown for nesting, and often roosts in similar locations. Nesting density only about 150 km ² /pair (n = 4, Kemp, 1995).	<u>Highly unlikely</u> Due to the small extent of the study site and the disturbance surrounding it. Uncommon in open areas within Gauteng (Marais & Peacock, 2008).
<i>Falco naumanni</i> * (Lesser Kestrel) (VU)	None on site: Non-breeding Palaearctic migrant. Forages preferentially in pristine open grassland but also hunts in converted grassland such as small scale pastures provided the conversion is not as total as in plantation forestry or in areas of consolidated agricultural monoculture (Barnes, 2000; Hockey <i>et al.</i> , 2005) such as maize, sorghum, peanuts, wheat, beans and other crops (Tarboton & Allan, 1984) where they hunt for large insects and small rodents.	<u>Unlikely</u> Only on rare occasions. Localised summer migrant (Marais & Peacock, 2008).

SCIENTIFIC NAME	PRESENCE OF SUITABLE HABITAT AND HABITAT REQUIREMENTS	LIKELIHOOD OF OCCURRENCE ON STUDY SITE
	but avoid wooded areas except on migration. They roost communally in tall trees, mainly <i>Eucalyptus</i> , in urban areas (Barnes, 2000), often in towns or villages, but also in farm lands (pers. obs). Favour a warm, dry, open or lightly wooded environment, and are concentrated in the grassy Karoo, western fringes of the grassland biome and southeast Kalahari. Generally avoids foraging in transformed habitats but occurs in some agricultural areas, including croplands, in Fynbos and Renosterveld of the Western Cape (Hockey <i>et al.</i> , 2005). Large numbers congregate in sweet and mixed grasslands of the Highveld regions.	
<i>Falco biarmicus</i> * (Lanner Falcon) (NT)	None on site. Most frequent in open grassland, open or cleared woodland, and agricultural areas. Breeding pairs generally favour habitats where cliffs are available as nest and roost sites, but will use alternative sites such as trees, electricity pylons and building ledges if cliffs are absent (Hockey <i>et al.</i> , 2005). Mountains or open country, from semi desert to woodland and agricultural land, also cities (Maclean, 1993), even on forest-grassland ecotones. Generally a cliff nesting species and its wider distribution is closely associated with mountains with suitable cliffs. Able to breed on lower rock faces than Peregrine Falcon <i>Falco peregrinus</i> and also utilises the disused nests of other species, such as crows, other raptors and storks, on cliffs, in trees and on power pylons, and also quarry walls (Tarboton <i>et al.</i> , 1987). Generally prefers open habitats e.g. alpine grassland and the Kalahari, but exploits a wide range of habitats – grassland, open savanna, agricultural lands, suburban and urban areas, rural settlements – in both flat and hilly or mountainous country. Also breeds in wooded and forested areas where cliffs occur (Harrison <i>et al.</i> , 1997).	<u>Highly unlikely</u> Due to a lack of suitable breeding habitat. Uncommon resident in open areas in Gauteng (Marais & Peacock, 2008).
<i>Falco peregrinus</i> (Peregrine Falcon) (NT)	None on site. Resident <i>F. p. minor</i> mostly restricted to mountainous riparian or coastal habitats, where high cliffs provides breeding and roosting sites. Breeding pairs prefer habitats that favour specialised high speed, aerial hunting, e.g. high cliffs overhanging vegetation with raised and/or discontinuous canopy (eg forest, fynbos, woodland), or expanses of open water. Also uses quarries and dam walls, and frequents city centres, e.g. Cape Town, where tall buildings substitute for rock faces. Migrant <i>F. p. calidus</i> in more open country, often coastal, even roosting on ground on almost unvegetated salt flats.	<u>Highly unlikely</u> Due to a lack of suitable breeding habitat. Could move through the area or rare occasions. Uncommon resident and summer migrant in Gauteng (Marais & Peacock, 2008).
<i>Mycteria ibis</i> (Yellow-billed Stork) (NT)	None on site. Utilises diverse wetlands and permanent and seasonal habitats, including alkaline and freshwater lakes, river, dams, pans, flood plains, large marshes, swamps, estuaries, margins of lakes or rivers, flooded grassland and small pools or streams where there are areas of shallow water free of emergent vegetation (Tarboton <i>et al.</i> , 1987); less often marine mudflats and estuaries (Hockey <i>et al.</i> , 2005). Nests colonially on large trees adjacent to productive wetlands, but only locally and erratically during ideal conditions.	<u>Highly unlikely</u> Due to a lack of suitable habitat. Common at large wetlands within Gauteng; erratic elsewhere (Marais & Peacock, 2008).

SCIENTIFIC NAME	PRESENCE OF SUITABLE HABITAT AND HABITAT REQUIREMENTS	LIKELIHOOD OF OCCURRENCE ON STUDY SITE
<i>Ciconia nigra</i> * (Black Stork) (NT)	None on site. Dams, pans, flood plains, shallows of rivers, pools in dry riverbeds, estuaries and sometimes on marshland and flooded grassland; uncommon at seasonal pans lacking fish. Associated with mountainous regions (Hockey <i>et al.</i> , 2005) where they nest (Maclean, 1993) on cliffs (Harrison <i>et al.</i> , 1997). Feeds in shallow water, but occasionally on dry land, in streams and rivers, marshes, floodplains, coastal estuaries, large and small dams; it is typically seen at pools in large rivers.	<u>Highly unlikely</u> Due to a lack of suitable breeding and foraging habitat.
<i>Mirafra cheniana</i> (Melodious Lark) (NT)	None on site. Occurs in grassland dominated by <i>Themeda triandra</i> grass in South Africa. Occasionally in planted pastures of <i>Eragrostis curvula</i> and <i>E. tef.</i> Avoids wet lowlands, favouring fairly short grassland (< 0.5 m), with open spaces between tussocks, at 550 – 1 750 m.a.s.l. with annual rainfall of between 400 – 800 mm p/a (Hockey <i>et al.</i> , 2005).	<u>Unlikely</u> Due to a lack of suitable habitat. Localised resident in Gauteng (Marais & Peacock, 2008) where suitable habitat occurs.

*Priority Red Data bird species according to GDARD.

6. FINDINGS AND POTENTIAL IMPLICATIONS

The habitat systems on the study site will not favour any of the mentioned Red Data avifaunal species due to a lack of suitable breeding, roosting and foraging habitat. The rest of the area within 500 m surrounding the study is unsuitable for any Red Data avifaunal species due to high human density and human presence and the area being transformed by man to make place for roads, residential, businesses and agricultural purposes.

7. LIMITATIONS, ASSUMPTIONS AND GAPS IN KNOWLEDGE

The on-site bird survey was done outside the main breeding season of most species and during the time when all Palaearctic and intra-African migrants had already migrated to the north. This, however, will not have an effect on recording Red Data species, since most Red Data species are resident to South Africa and the few Red Data species that are Palaearctic migrants are mainly threatened in their northern hemisphere distribution ranges. The general assessment of species rests mainly on the 1987 atlas for birds of the then-Transvaal (Tarboton *et al.*, 1987) and comparison with the 1997 SABAP atlas (Harrison *et al.*, 1997), so any limitations in either of those studies will by implication also affect this survey and conclusions.

8. RECOMMENDED MITIGATION MEASURES

The following mitigation measures are proposed by the specialist:

- Where possible, **work should be restricted to one area at a time**, as this will give the smaller birds, mammals and reptiles a chance to weather the disturbance in an undisturbed zone close to their natural territories.
- **No vehicles should be allowed to move in or across the wet areas or drainage lines and possibly get stuck.** This leaves visible scars and destroys habitat, and it is important to conserve areas where there are tall reeds or grass,

or areas where there is short grass and mud.[cf. saying the drainage line is the same as the surrounding grasslands?]

- The contractor must ensure that no fauna is 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.
- It is suggested that where work is to be done close to the drainage lines, these areas **be fenced off during construction**, to prevent heavy machines and trucks from trampling the plants, compacting the soil and dumping in the system.
- 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.
- Alien and invasive plants must be removed.

9. CONCLUSION

In general, 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 areas surrounding the study site are increasingly being developed to make room for residential areas. The disturbed grassland area will only attract the more common grassland avifaunal species and the rest of the study site will attract bird species that are able to adapt to the transformed and disturbed areas. Of all the 27 Red Data avifaunal species recorded for the 2527DD q.d.g.c. none are likely to make use of the habitat system identified on and within 500 m surrounding the study site on a permanent or temporarily basis due to a lack of suitable breeding, roosting and foraging habitat.



Figure 7: Avifaunal sensitivity map of the site

10. LITERATURE SOURCES

- Barnes, K.N. (ed.). 1998. *The Important Bird Areas of southern Africa*. Johannesburg: BirdLife South Africa.
- Barnes, K.N. (ed.). 2000. *The Eskom Red Data Book of Birds of South Africa, Lesotho and Swaziland*. BirdLife South Africa, Johannesburg.
- Chittenden, H. 2007. *Roberts Bird Guide*. John Voelcker Bird Book Fund, Cape Town.
- Harrison, J.A., Allan, D.G., Underhill, L.G., Herremans, M., Tree, A.J., Parker, V. & Brown, C.J. (eds.). 1997. *The Atlas of Southern African Birds*. Vol. 1 & 2. BirdLife South Africa, Johannesburg.
- Hockey, P.A.R., Dean, W.R.J. & Ryan, P.G. 2005. *Roberts Birds of Southern Africa VII th Edition*, The Trustees of the John Voelcker Bird Book Fund, Cape Town.
- Keith, S., Urban, E.K. & Fry, C.H. 1992. *The Birds of Africa*. Vol. 4. Academic Press, London.
- Kemp, A. C. 1995. Aspects of the breeding biology and behaviour of the Secretarybird *Sagittarius serpentarius* near Pretoria, South Africa. *Ostrich* 66: 61-68.
- Kemp, A.C. & Calburn, S. 1987. *The owls of southern Africa*. Cape Town: Struik Winchester.
- Maclean, G.L., 1990. *Ornithology for Africa*. University of Natal Press, Pietermaritzburg.
- Maclean, G.L., 1993. *Roberts' Birds of Southern Africa*. John Voelcker Bird Book Fund, Cape Town.
- Marais, M. & Peacock, F., 2008. *The Chamberlain guide to Birding Gauteng*, Mirafr Publishing, CTP Book Printers, Cape Town
- Mucina, L. & Rutherford, M.C. (eds) 2006. *The vegetation of South Africa, Lesotho and Swaziland*. Strelitzia 19. South African National Biodiversity Institute, Pretoria.
- Peacock, F., 2006. *Pipits of Southern Africa – a complete guide to Africa's ultimate LBJ's*, Published by the author, Pretoria; www.pipits.co.za.
- Percy, W., & Pitman C.R.S., 1963 *Further notes on the African Finfoot, Podica senegalensis* (Viellot). *Bull. Br. Ornithol. Club* 83:127-132 .
- Sinclair, I., Hockey, P. & Tarboton W. 2002. *Sasol Birds of Southern Africa*. Struik, Cape Town.
- Sinclair I., & Hockey P. 2005. *The Larger Illustrated Guide to Birds of Southern Africa*. Struik, Cape Town.
- Steyn, P. 1982. *Birds of prey of southern Africa*. Claremont, Cape Town: David Philip.
- Tarboton, W.R., Kemp, M.I., & Kemp, A.C. 1987. *Birds of the Transvaal*. Transvaal Museum, Pretoria.
- Tarboton, W., 2001. *A Guide to the Nests and Eggs of Southern African Birds*. Struik, Cape Town.
- Urban, E.K., Fry, C.H., & Keith, S., 1986. *Birds of Africa*. Vol. 2. Academic Press, London.

APPENDIX D: HERPETOFAUNA REPORT

ANNEXURE D1iii:

MAMMAL ASSESSMENT

GALAGO ENVIRONMENTAL



Fauna and Flora Specialists

638 Turf St

Wingate Park, 0181

Tel: 012-345 4891

Fax: 086 675 6136

Email: Vanessam@lantic.net

Mammal Habitat Assessment

of

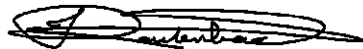
**PORTIONS 27 AND 73 OF THE FARM
NIETGEDACHT 535 JQ**

April 2011

Report author: I.L. Rautenbach Pr.Sci.Nat., Ph.D, T.H.E.D.

Declaration of Independence: I, Ignatius Lourens Rautenbach (421201 5012 00 5) declare that I:

- am committed to biodiversity conservation but concomitantly recognize the need for economic development. Whereas I appreciate the opportunity to also learn through the processes of constructive criticism and debate, I reserve the right to form and hold my own opinions and therefore will not willingly submit to the interests of other parties or change my statements to appease them
- abide by the Code of Ethics of the S.A. Council for Natural Scientific Professions
- act as an independent specialist consultant in the field of zoology
- am subcontracted as specialist consultant by Galago Environmental CC for the proposed project "Mammal Habitat Assessment Portions 27 and 73 Farm Nietgedacht 535 JQ" described in this report
- have no financial interest in the proposed development other than remuneration for work performed
- have or will not have any vested or conflicting interests in the proposed development
- undertake to disclose to the Galago Environmental CC and its client as well as the competent authority any material information that have or may have the potential to influence the decision of the competent authority required in terms of the Environmental Impact Assessment Regulations 2006



I.L. Rautenbach

1. INTRODUCTION

Galago Environmental CC. was appointed to undertake a mammal habitat survey of Portions 27 and 73 of the Farm Nietgedacht 535 JQ, which is proposed for residential, commercial and business development.

This report focuses on the reigning status of threatened and sensitive mammals likely to occur on the proposed development site. Special attention was paid to the qualitative and quantitative habitat conditions for Red Data species deemed present on the site, and mitigation measures to ameliorate the effect of development are suggested. The secondary objective of the investigation was to gauge which mammals might still reside on the site and compile a complete list of mammal diversity of the study area.

2. SCOPE AND OBJECTIVES OF THE STUDY

- To qualitatively and quantitatively assess the significance of the mammal habitat components and current general conservation status of the property;
- Comments on ecological sensitive areas;
- Comments on connectivity with natural vegetation and habitats on adjacent sites;
- To provide a list of mammals which occur or might occur, and to identify species of conservation importance;
- To highlight potential impacts of the proposed development on the mammals of the study site, and
- To provide management recommendations to mitigate negative and enhance positive impacts should the proposed development be approved.

3. STUDY AREA

In the past the study site has been tilled, however, fields have been left fallow for a considerable period and natural succession has progressed to the stage where a lush stand of *Hyperthelia* grass has developed. The 30.04 ha site (2527DD) (Sunrella, Greater Johannesburg, Gauteng) is wedged between the R552 and the N14. It is located in the Egoli Granite Grassland veld type (Mucina and Rutherford, 2006). However, although the superficial appearance of the basal cover appears natural, it is in fact disturbed and no longer answers to the definition of the Egoli Granite Grassland. As such, its conservation status is generally rated as low, although for small terrestrial mammals the reigning environmental condition is rated higher.

The topography of the area is typical rolling plains of the Highveld Grassland of the interior. There are no caves suitable as daytime roosts for cave-dwelling bats.

A main feature of the study site is a drainage line receiving rainwater from north-east and south-west facing slopes as well as from the R552. A number of young termitaria have been recorded. The soil is brown-sandy in nature, except in the drainage line where it is clayish.

The 500 meters of adjoining properties include the R552 and the N14, and apart from these it is rural in nature with grassland components dominating. The study site is marred by a number of ruins, exotic trees and especially dumping of building rubble.

The study site is defined by the following GPS coordinates: 25° 58.111'S; 27° 56.373'E.

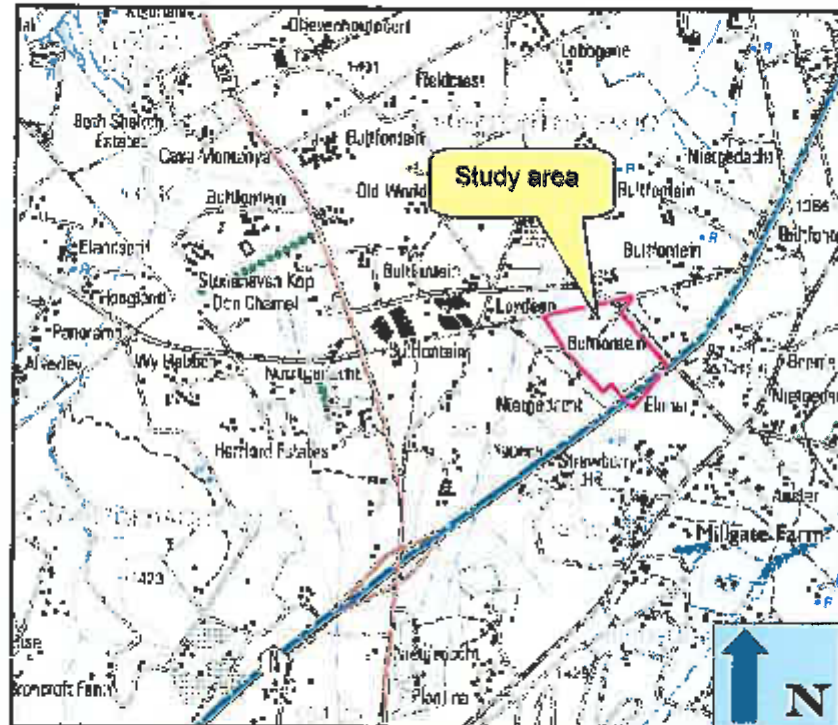


Figure 1: Locality map of the study area

4. METHODS

An eight-hour site visit was conducted on 1 March 2011. During this visit the observed and derived presence of mammals associated with the recognized habitat types of the study site, were recorded. This was done with due regard to the well recorded known distributions of Southern African mammals, coupled to the qualitative and quantitative nature of recognized habitats.

The 500 meters of adjoining properties was scanned for important fauna habitats.

4.1 Field Surveys

During the site visit mammals were identified by visual sightings through random transect walks. No trapping or mist netting was conducted, as the terms of reference did not require such intensive work. In addition, mammals were also identified by means of spoor, droppings, burrows or roosting sites. Locals were interviewed to confirm occurrences or absences of species.

Three criteria were used to gauge the probability of occurrence of mammals on the study site. These include known distribution range, habitat preference and the qualitative and quantitative presence of suitable habitat.

4.2 Desktop Surveys

As the majority of mammals are secretive, nocturnal, hibernators and/or seasonal, distributional ranges and the presence of suitable habitats were used to deduce the presence or absence of these species based on authoritative tomes, scientific literature, field guides, atlases and databases. This can be done irrespective of season.

The probability of occurrences of mammal species was based on their respective geographical distributional ranges and the suitability of on-site habitat. In other words, *high* probability would be applicable to a species with a distributional range overlying the study site as well as the presence of prime habitat occurring on the study site. Another consideration for inclusion in this category is the inclination of a species to be common, i.e. normally occurring at high population densities.

Medium probability pertains to a mammal species with its distributional range peripherally overlapping the study site, or required habitat on the site being sub-optimal. The size of the site as it relates to its likelihood to sustain a viable breeding population, as well as its geographical isolation is also taken into consideration. Species categorised as *medium* normally do not occur at high population numbers, but cannot be deemed as rare. A *low* probability of occurrence will mean that the species' distributional range is peripheral to the study site and habitat is sub-optimal. Furthermore, some mammals categorised as *low* are generally deemed rare.

4.3 Specific Requirements

During the visit the site was surveyed and assessed for the potential occurrence of Red Data and/or ridge and wetland-associated species such as:

Juliana's golden mole (*Neamblosomus juliana*), highveld golden mole (*Amblysomus septentrionalis*), rough-haired golden mole (*Chrysospalax villosus*), African marsh rat (*Dasymys incomtus*), Angoni vlei rat (*Otomys angoniensis*), vlei rat (*Otomys irroratus*), white-tailed rat (*Mystromys albicaudatus*), rock dormouse (*Graphiurus murinus*), forest shrew (*Myosorex varius*), other shrew species, short-eared trident bat (*Cloeotis percivali*), other cave-dwelling bats, African clawless otter (*Aonyx capensis*), spotted-necked otter (*Lutra maculicollis*), marsh mongoose (*Atilax paludinosus*).

5. RESULTS

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 known distribution ranges. Slight records and information from residents or knowledgeable locals audit such deductions.

Mammal Habitat Assessment

Two mammal habitats are present on the study site. The terrestrial habitat dominates, whereas a weakly developed wetland is present along the basin of the drainage line. The grass cover of the terrestrial habitat is high and dense and provides excellent refuge and nourishment for a number of robust small mammals. However, judging from the lack of detritus on the surface, it is surmised that the grass cover is subjected to veld fires during winter, which is detrimental to small mammal

populations. A large track of the terrestrial terrain along the wetland has been invaded by Kikuyu. The wetland is highly seasonal and clearly only receives water during rains. However, this is sufficient to support wetland vegetation and Kikuyu growing on heavy clay.

The exotic trees cannot be expected to harbour arboreal mammals. Rocky outcrops offering nooks and crannies for refuge for rupicolous small mammals are absent from the study site. Ruins and dumping of building rubble mar the site.

On two sides the study site is bordered by highways, whereas a 500 meter zone of other adjoining properties consists of mixed land-use practices which include grassland. Connectivity in the latter direction is excellent.

The study site contains no daytime roosting opportunities for cave-dwelling bats.



Figure 2: A south-westerly view over the site illustrating the stand of exotic trees, dense grass cover and building rubble.

Expected and Observed Mammal Species Richness

Large mammals have succumbed to farming pressures more than a century ago. Latterly medium-sized mammals have also begun the process of yielding to increasing civilization pressures (viz. aardvark, springhare, steenbok and duiker).

Mammals closely reliant on rupicolous and arboreal habitats have *a priori* been omitted from the list of possible occurrences, since these habitats are absent.

Of the 24 mammal species expected to occur on the study site (Table 1), only two were confirmed during the site visit (Table 2). It should be noted that potential occurrences are interpreted as to be possible over a period of time as result of expansion and contractions of population densities and ranges which stimulate migration. In this instance the throttling effect of the adjoining highways and secondary roads diminish natural migrations *sensu lato*.

Table 1 lists the mammals which were observed or deduced to occupy the site, or to be occasional visitors. All feral mammal species expected to occur on the study site

(e.g. house mice, house rats, dogs and cats) were omitted from the assessment since these species normally associate with human settlements.

Most of the species of the resident diversity (Table 1) are common and widespread. This statement must be interpreted against the background that most of the study site has been tilled in the past, and since the ecological succession commenced, small mammals have emigrated from adjoining areas. The entire district has been grazed and pristine habitat for discerning species has been damaged resulting in an absence or dearth of discerning species such as white-tailed rats and S.A. marsh rats.

The small carnivores listed (Table 1) have reticent habits rendering difficult to detect, and have catholic diets. They are commonly recorded close to habitation, on condition that sufficient prey is available.

The three vespertilionid bats are common and widespread, especially since they managed to extend their natural distribution ranges by capitalizing on daytime roosting sites offered by manmade structures on the Highveld. There are no roosting opportunities for these species on the study site, but they can be expected to feed on insect swarms rising over the wetland during warm summer sunsets.

The low mammal diversity is due to past and present extirpations, average habitat diversity, restricted site size and adjoining areas, and a low quality of conservation.

Threatened and Red Listed Mammal Species

The listed shrews are not necessarily endangered. Although these musk shrews commonly occur in gardens it has not been adequately studied to provide quantitative field data to accurately assign a conservation ranking and are thus as a precaution considered as 'Data Deficient'. Shrews operate at the apex of the food pyramid, which means that their population numbers are significantly lower than that of their prey species or of similar-sized herbivores/granivores. Because of their diet, they are furthermore not readily trapped with conventional bait or traps, which may mean that their numbers are under-estimated.

Hedgehogs ('Near Threatened') are capable to withstand predation with their passive defence mechanisms. They became endangered directly as result of predation by humans and their pets; considering the semi-urban nature of the natural areas of the site, its continued presence is likely.

Vlei rats are cited under this subheading since they are considered as sensitive as a result of the intolerance to drought conditions of their habitat.

No other 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 habitat(s).

Table 1: The mammals which were observed or deduced to occupy the site
(Systematics and taxonomy as proposed by Bronner et.al [2003] and Skinner and Chimimba [2005])

	SCIENTIFIC NAME	ENGLISH NAME
✓	<i>Lepus saxatilis</i>	Scrub hare
✓	<i>Cryptomys hottentotus</i>	African mole rat
✓	<i>Rhabdomys pumilio</i>	Four-striped grass mouse
✓	<i>Mus minutoides</i>	Pygmy mouse
✓	<i>Mastomys natalensis</i>	Natal multimammate mouse
✓	<i>Mastomys coucha</i>	Southern multimammate mouse

	SCIENTIFIC NAME	ENGLISH NAME
*	<i>Aethomys ineptus</i>	Tete veld rat
√	<i>Otomys angoniensis</i>	Angoni vlei rat
√	<i>Otomys irroratus</i>	Vlei rat
*	<i>Gerbilliscus brantsii</i>	Highveld gerbil
?	<i>Dendromus melanotis</i>	Grey pygmy climbing mouse
?	<i>Dendromus mesomelas</i>	Brants' climbing mouse
?	<i>Dendromus mystacalis</i>	Chestnut climbing mouse
DD*	<i>Crocidura cyanea</i>	Reddish-grey musk shrew
DD*	<i>Crocidura hirta</i>	Lesser red musk shrew
NT?	<i>Atelerix frontalis</i>	Southern African hedgehog
√	<i>Neoromicia capensis</i>	Cape serotine bat
√	<i>Scotophilus dinganii</i>	African yellow house bat
√	<i>Scotophilus viridis</i>	Greenish yellow house bat
?	<i>Genetta genetta</i>	Small-spotted genet
?	<i>Genetta tigrina</i>	SA large-spotted genet
√	<i>Cynictis penicillata</i>	Yellow mongoose
√	<i>Galerella sanguinea</i>	Slender mongoose
?	<i>Canis mesomelas</i>	Black-backed jackal

√ Definitely there or have a high probability to occur;

* Medium probability to occur based on ecological and distributional parameters;

? Low probability to occur based on ecological and distributional parameters.

Rod Data species rankings as defined in Friedmann and Daly's S.A. Red Data Book / IUCN (World Conservation Union) (2004) are indicated in the first column: CR = Critically Endangered, En = Endangered, Vu = Vulnerable, LR/cd

= Lower risk conservation dependent, LR/nt = Lower Risk near threatened, DD = Data Deficient. All other species are deemed of Least Concern.

Table 2: Mammal species positively confirmed from the study site, observed indicators and habitat.

SCIENTIFIC NAME	ENGLISH NAME	OBSERVATION INDICATOR	HABITAT
<i>O. angoniensis</i>	Angoni vlei rat	Grass cuttings	Wetland
<i>O. irroratus</i>	Vlei rat	Grass cuttings	Wetland

Vlei rats are narrowly dependent on moist conditions amongst semi-aquatic vegetation. Although they are not deemed endangered, they are nevertheless sensitive considering their close reliance on wetland conditions.

6. FINDINGS AND POTENTIAL IMPLICATIONS

The floral composition of the terrestrial habitat can no longer be regarded as typical of Egoli Granite Grassland and is therefore not a sensitive unit. The present succession climax is nevertheless good habitat for the small mammals deduced to persist. However, neither this habitat nor the assemblage of mammals can be regarded as unique and worthy of blanket conservation.

The drainage line supports two sensitive rodents. In itself the drainage line / wetland is largely artificial (runoff stormwater from the highway), and is furthermore marginal since it is highly dependent of seasonal rainfall. The drainage line on the study site contributes to better-formed wetlands at lower altitudes, and will be more so during the operational phase of the project and implementation of the proposed mitigation measures.

Given the acceptance of the proposed mitigation measures, 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), significant loss of mammal habitat, nor of loss/displacement of threatened or protected species.



Figure 3: Mammal habitat map

7. LIMITATIONS, ASSUMPTIONS AND GAPS IN INFORMATION

The Galago Environmental personnel are amply experienced to derive reasonably accurate species lists of a location such as this site. Specialists have access to ample databases and information resources, and have earlier conducted numerous intensive field surveys which allow the extrapolation of habitat diversity and quality into species richness. In this instance an intensive mammal survey is deemed an expensive and fruitless experience with little chance of radically altering our primary data.

Even though every care is taken to ensure the accuracy of this report, environmental assessment studies are limited in scope, time and budget. Discussions and proposed mitigations are to some extent made on reasonable and informed assumptions built on *bona fide* information sources, as well as deductive reasoning. Deriving a 100% factual report based on field collecting and observations can only be done over several years and seasons to account for fluctuating environmental conditions and migrations. Since environmental impact studies deal with dynamic natural systems additional information may come to light at a later stage. Galago Environmental can thus not accept responsibility for conclusions and mitigation measures made in good faith based on own databases or on the information provided at the time of the directive. This report should therefore be viewed and acted upon with these limitations in mind.

8. RECOMMENDED MITIGATION MEASURES

The following mitigation measures are proposed by the specialist:

- Should hedgehogs be encountered during the development, these should be relocated 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.
- It is taken for granted that the developers will charge engineers with the task to design benign stormwater drainage and service installations.

9. CONCLUSION

The drainage line going through the site is the only habitat that could favour sensitive mammals and should be preserved and storm water management must ensure that it is not degraded.



Figure 4: Mammal sensitivity map

10. LITERATURE SOURCES

- Acocks, J.P.H. 1988. Veld types of South Africa, 3rd ed. *Memoirs of the Botanical Survey of South Africa*.
- Bredenkamp, G.J. & Brown, L.R. 2001. Vegetation – A reliable ecological basis for environmental planning. *Urban Greenfile* Nov-Dec 2001: 38-39.
- Bronner, G.N., Hoffmann, M., Taylor, P.J., Chimimba, C.T., Best, P.B., Mathee, C.A. & Robinson, T.J. 2003. A revised systematic checklist of the extant mammals of the southern African subregion. *Durban Museum Novitates* 28:56-103.

- Department of Environmental Affairs and Tourism. 2007. National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004): Publication of Lists of Critically Endangered, Endangered, Vulnerable and Protected Species. Government Notices.
- Directorate of Nature Conservation, GDACE. 2009. GDACE Requirements for Biodiversity Assessments, Version 2. Gauteng Provincial Government.
- Friedman, Y. and Daly, B. (editors). 2004. *Red Data Book of the Mammals of South Africa: A Conservation Assessment*. CBSG Southern Africa, Conservation Breeding Specialist Group (SSC/IUCN), Endangered Wildlife Trust. South Africa.
- Knobel, J. & Bradenkamp, G. 2005. *The magnificent natural heritage of South Africa*. Roggebaai, Sunbird Publishers.
- Low, A.B. & Rebelo, A.G. 1996. 'Vegetation Map of South Africa, Lesotho and Swaziland. Department of Environmental Affairs and Tourism, Pretoria.
- Low, A.E. & Rebelo, A.G. (eds). 1998. *Vegetation of South Africa, Lesotho and Swaziland*. A companion to the Vegetation Map of South Africa, Lesotho and Swaziland. Department of Environmental Affairs & Tourism, Pretoria.
- Meester, J.A.J., Rautenbach, I.L., Dippenaar, N.J. & Baker, C.M. 1986. *Classification of Southern African Mammals*. Transvaal Museum Monograph No. 5. Transvaal Museum, Pretoria, RSA.
- Mills, G. & Hes, L. 1997. *The complete book of Southern African Mammals*. Struik Winchester, Cape Town, RSA.
- Mucina, L. & Rutherford, M.C. 2006. *The vegetation of South Africa, Lesotho and Swaziland*. Strelitzia 19. South African National Biodiversity Institute, Pretoria.
- Rautenbach, I.L. 1978. A numerical re-appraisal of the southern African biotic zones. *Bulletin of the Carnegie Museum of Natural History* 6:175-187.
- Rautenbach, I.L. 1982. *Mammals of the Transvaal*. Ecoplan Monograph No. 1. Pretoria, RSA.
- Russel, P.J., Wolfe, S.L., Hertz, P.E., Starr, C., Fenton, M.B., Addy, H., Maxwell, D., Haffie, T. and Davey, K. 2010. *Biology: Exploring the Diversity of Life*. First Canadian Edition. Nelson Education, Toronto. 1256pp.
- Skinner, J.D. & Chimimba, T.C. 2005. *The Mammals of the Southern African Subregion*. 3rd edition. Cambridge University Press.
- Skinner, J.D. & Smithers, R.H.N. 1990. *The Mammals of the Southern African Subregion*. 2nd edition. Pretoria: University of Pretoria.
- Smithers, R.H.N. 1983. *The Mammals of the Southern African Subregion*. Pretoria: University of Pretoria.
- Taylor, P.J. 1998. *The Smaller Mammals of KwaZulu-Natal*. University of Natal Press: Pietermaritzburg.
- Taylor, P.J. 2000. *Bats of Southern Africa*. University of Natal Press: Pietermaritzburg.
- The Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983)
- The Environmental Conservation Act, 1989 (Act No. 73 of 1989)
- The National Environment Management Act, 1998 (Act No. 107 of 1998)
- The National Environmental Management Biodiversity Act, 2004. (Act 10 of 2004). Government Gazette RSA Vol. 487, 26436, Cape Town, June 2004.
- The National Environmental Management Biodiversity Act, 2004. (Act 10 of 2004). Draft List of Threatened Ecosystems. Government Gazette RSA Vol. 1477, 32689, Cape Town, 6 Nov 2009.
- The National Forests Act, 2006 (Act 84 of 1998 as amended). Government Gazette RSA Vol. 897, 29062, Cape Town, 8 Sept 2006.
- The Natural Scientific Professions Act (Act 27 of 2003).

APPENDIX C: AVIFAUNA REPORT

GALAGO ENVIRONMENTAL



Fauna and Flora Specialists

638 Turf St

Wingate Park, 0181

Tel: 012-345 4891

Fax: 086 675 6136

Email: Vanessam@lantic.net

Herpetofaunal Habitat Assessment

of

**PORTIONS 27 AND 73 OF THE FARM
NIETGEDACHT 535-JQ**

April 2011

Report author: Mr. W.D. Haacke (Pri. Sci. Nat: M.Sc)

TABLE OF CONTENTS

1.	INTRODUCTION	3
2.	OBJECTIVES OF THE HABITAT STUDY	3
3.	SCOPE OF STUDY	3
4.	STUDY AREA	3
5.	METHOD	4
6.	RESULTS	7
7.	FINDINGS AND POTENTIAL IMPLICATIONS	9
8.	LIMITATIONS, ASSUMPTIONS AND GAPS IN KNOWLEDGE	10
9.	RECOMMENDED MITIGATION MEASURES	10
10.	CONCLUSION	10
11.	LITERATURE SOURCES	11

FIGURES:

Figure 1: Locality map of the study area	4
Figure 2: View in a southwesterly direction.	5
Figure 3: View southwards, uphill across the drainage line, towards the N14.	5
Figure 4: Herpetofauna sensitivity map.....	10

TABLES:

Table 1: The Reptiles and Amphibians that could occur on the site:-	7
---	---

1. INTRODUCTION

Galago Environmental CC was appointed to undertake a reptile and amphibian habitat survey of Portions 27 and 73 of Farm Nietgedacht 535 JQ in Gauteng province, which is proposed for residential development

The objective was to determine which species might still occur on the site. Special attention had to be given to the habitat requirements of all the Red Data species which may occur in the area. This survey focuses on the current status of threatened herpetofaunal species occurring, or which are likely to occur, on the proposed development site and a description of the available and sensitive habitats on the site.

2. OBJECTIVES OF THE HABITAT STUDY

- To assess the current status of the habitat component and current general conservation status of the property;
- To provide lists of reptiles and amphibians which occur or might occur and to identify species of conservation importance;
- To highlight potential impacts of the development on the herpetofauna of the study site; and
- To provide management recommendations to mitigate negative and enhance positive impacts should the proposed development be approved.

3. SCOPE OF STUDY

This report:

- Is a reptile and amphibian survey based on the presence of suitable habitat, sightings and literature;
- Comments on ecologically sensitive areas;
- Evaluates the conservation importance and significance of the site with special emphasis on the current status of resident threatened species;
- Offers recommendations to reduce or minimise impacts, should the proposed development be approved.

4. STUDY AREA

The study site lies southwest of Pretoria, north of the N14 and east of the R512. The terrain slopes northwestwards from the edge of the N14 and a drainage valley runs down the middle before turning further westwards and joining the next drainage valley which runs northwards and forms part of the Hennops River drainage system. The shape of the study site is nearly rectangular with a slight southerly extension of the southwestern corner across the N14 and a sharp triangular extension from the northeastern corner.

The habitat consists mainly of long grassveld of the Egoli Granite Grassland biotype. The northwestern, low-lying section of the study site was formerly occupied as a farm and has been seriously disturbed. A track from the northeast leading to the ruins of the former farmhouse is lined with *Melia* sp., which is common around ruins and occur scattered towards the northern borderline, which has remnants of a row of *Eucalyptus* trees. In the northern part of the study site, along the lower section of the drainage line and near the farmhouse ruin, some *Acacia karroo* occur amongst the otherwise exotic trees (Figure 2). The track as far as the ruins has been used to dump building and other rubble. The grassveld along the track and around the ruins is seriously invaded by the usual agricultural weeds. The upper grassy slopes towards the south appear to be relatively undisturbed grassveld (Figure 3).

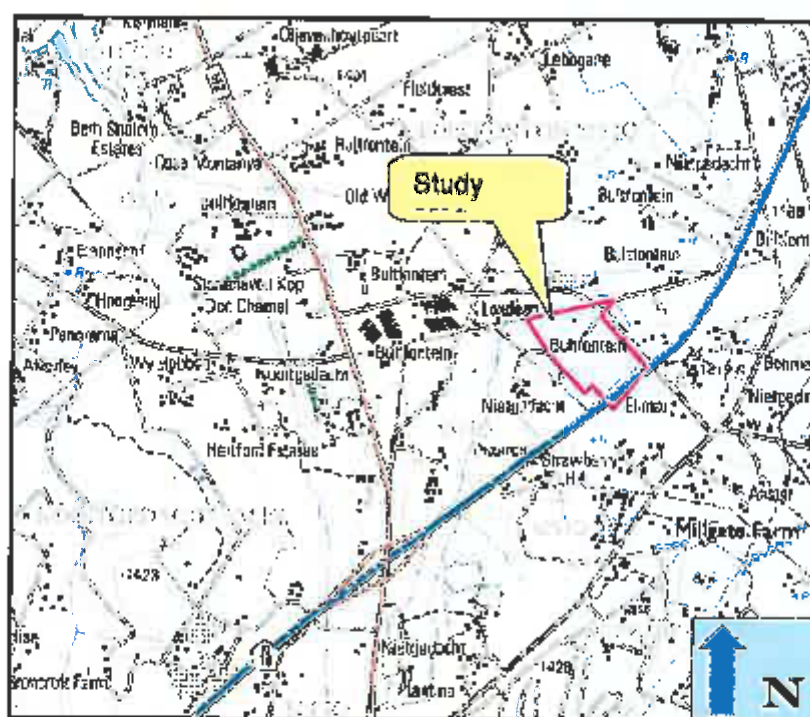


Figure 1: Locality map of the study area

5. METHOD

A site visit was conducted on 26 February 2011. During this visit habitat types of the study site were recorded. The possible presence of herpetofauna was deduced from these observations. This was done in consideration of the known distributions of Southern African herpetofauna (SARCA Reptile Survey 2006 – 2009, Minter *et al.*, 2004)



Figure 2: View in a southwesterly direction along track past ruin of former farmhouse, with building rubble dumps in seriously disturbed grassveld.



Figure 3: View southwards, uphill across the drainage line, towards the N14. In the foreground weed infested edge of track and *Melia sp* trees.

The 500 meters of adjoining properties were scanned for important faunal habitats. Apart from the presence of a major highway and roads (N14 and secondary roads), a few smallholdings with informal settlements and a large storage facility occur on the extended study area. This extends to the larger drainage line to the west, which forms part of the Hennops River system. In this line, near the N14 highway, is a small dam, which is fairly deep, has steep edges and is thus unsuitable as a breeding pond for the Giant Bullfrog.

5.1.1 Field Surveys

It was attempted to identify reptiles and amphibians visually during random transect walks. The dense grass does not expose open basking areas, thereby making it difficult to detect terrestrial reptiles. No burrows or recognizable reptile habitats, such as termitaria, of which the moribund specimens are ideal reptile retreats, were noticed. The rubble heaps could potentially provide shelter. No amphibians could be identified by their calls as none were vocalising.

5.1.2 Desktop Surveys

As the majority of reptiles and amphibians are secretive, nocturnal and/or poikilothermic or seasonal, distributional ranges and the presence of suitable habitats were used to deduce the presence or absence of these species based on authoritative tomes, scientific literature, field guides, atlases and databases. This can be done irrespective of season. The probability of occurrences of herpetofaunal species was based on their respective documented ranges (SARCA Reptile Survey, 2006 – 2009; Minter *et al*, 2004) and the suitability of on-site habitats. In other words, *high* probability would be applicable to a species with a range overlying the study site as well as the presence of prime habitat occurring on the study site. Another consideration for inclusion in this category is the inclination of a species to be common, i.e. normally occurring at high population densities.

Medium probability pertains to a herpetofaunal species with its range peripherally overlapping the study site, or required habitat on the site being sub-optimal. The size of the site as it relates to its likelihood to sustain a viable breeding population, as well as its geographical isolation is also taken into consideration. Species categorised as *medium* normally do not occur at high population numbers, but cannot be deemed as rare. A *low* probability of occurrence will mean that the species' range is peripheral to the study site and habitat is sub-optimal. Furthermore, some herpetofauna categorised as *low* are generally deemed rare.

Based on the impressions gathered during this visit and records in the Transvaal Museum, the documentation of the herpetofauna of the then Transvaal by Dr N. H. G. Jacobsen (Unpublished Ph.D. thesis, University of Pretoria, 1989) and his internal report for the Gauteng Province (1995), the "Atlas and Red Data Book of the Frogs of South Africa, Lesotho and Swaziland" (Minter, *et al*, 2004) and the results of the "SARCA Reptile Survey 2006 – 9, the following list of species which may occur on this site was compiled. The vegetation type was analysed according to the standard handbook by Mucina and Rutherford (eds) (2006).

5.1.3 Specific Requirements

During the visit the site was surveyed and assessed for the potential occurrence of Red Data species such as:

- Giant Bullfrogs (*Pyxicephalus adspersus*)
- Striped Harlequin Snake (*Homoroselaps dorsalis*)
- Southern African Python (*Python natalensis*).

6. RESULTS

Amphibians

The dense grassland adjacent to the wetland vegetation appears unsuitable for the Giant Bullfrog and the clayey, stoney substrate is not suitable for burrowing. The water bodies available are seasonally running drainage lines and artificial dams, none of which are suitable for Bullfrog reproduction. The other listed amphibians may be able to utilize this site, especially the dryland species, while the aquatic frogs require open water.

- Giant Bullfrogs (*Pyxicephalus adspersus*): The habitat on this study site, with sloping hillsides and stony substrate, does not appear to be suitable for this frog. Although recorded from this quarter degree grid cell it is unlikely to occur here.

Reptiles:

No termitaria of the Long-nosed Haymaking Termite (*Trinervitormes havertlandi*) were observed, either in active or moribund condition. The latter, with access to the internal tunnel system, are ideal retreats for small animals, vertebrates and invertebrates. The Striped Harlequin Snake uses these termitaria and the easiest way to verify the presence of this taxon is to destroy these shelters. This study site is outside the documented range of the Southern African Python (SARCA, 2010), for which reason it may be accepted that this species does not occur here. The lack of a variety of suitable habitat types restricts the number of reptile species likely to occur here, therefore only terrestrial taxa are expected.

- Striped Harlequin Snake (*Homoroselaps dorsalis*): The stony substrate and the absence of termitaria, its favoured retreat, indicate that this snake probably does not occur on this site, although it has been recorded from this quarter degree grid cell.
- Southern African Python (*Python natalensis*): This site is beyond the southern limit of its known distribution range in Gauteng.

Table 1: The Reptiles and Amphibians that could occur on the site:-

SCIENTIFIC NAME	COMMON NAME	PROBABILITY OF OCCURRENCE
CLASS: AMPHIBIA	AMPHIBIANS	
ORDER: ANURA	FROGS	
Family: Bufonidae	Toads	
<i>Amietophryne gutturalis</i>	Guttural Toad	Medium
<i>Amietophryne garmani</i>	Eastern Olive Toad	Medium
<i>Schismaderma carens</i>	Red Toad	Medium
Family: Plipidae	Platannas	

SCIENTIFIC NAME	COMMON NAME	PROBABILITY OF OCCURRENCE
<i>Xenopus laevis</i>	Common Platanna	Medium
Family: Pyxicephalidae	Common Frogs	
<i>Amieta angolensis</i>	Common River Frog	Low
<i>Amieta fuscigula</i>	Cape River Frog	Low
<i>Pyxicephalus adspersus</i>	Giant Bullfrog	(?)
<i>Tomopterna cryptotis</i>	Tremolo Sand Frog	Low
<i>Tomopterna natalensis</i>	Natal Sand Frog	Low
<i>Cacosternum boettgeri</i>	Boettger's Caco	Medium
Family: Hyperoliidae	Reed Frogs	
<i>Kassina senegalensis</i>	Bubbling Kassina	Medium
Family: Microhylidae	Rubber Frogs	
<i>Phrynomantis bifasciatus</i>	Banded Rubber Frog	Low
CLASS: REPTILIA	REPTILES	
ORDER: SQUAMATA	SCALE-BEARING REPTILES	
Suborder: LACERTILIA	LIZARDS	
Family: Gekkonidae	Geckos	
<i>Lygodactylus capensis</i>	Cape Dwarf Gecko	Medium
<i>Pachydactylus affinis</i>	Transvaal Thick-toed Gecko	Low
<i>Pachydactylus capensis</i>	Cape Thick-toed Gecko	Low
Family: Agamidae	Agamas	
<i>Agama aculeata distantii</i>	Distant's Agama	Low
Family: Scincidae	Skinks	
<i>Trachylepis capensis</i>	Cape Skink	Low
<i>Trachylepis punctatissima</i>	Speckled Skink	Medium
<i>Trachylepis varia</i>	Variable Skink	Low
<i>Lygosoma sundevallii</i>	Sundevall's Writhing Skink	Low
<i>Panaspis wahlbergii</i>	Wahlberg's Snake-eyed Skink	Low
Family: Gerrhosauridae	Plated Lizards	
<i>Gerrhosaurus flavigularis</i>	Yellow-throated Plated Lizard	Low
Family: Cordylidae	Girdled Lizards	

SCIENTIFIC NAME	COMMON NAME	PROBABILITY OF OCCURRENCE
<i>Chamaesaura aenea</i>	Transvaal Grass Lizard	Low
Suborder: SERPENTES	SNAKES	
Family: Leptotyphlopidae	Thread Snake	
<i>Leptotyphlops incognitus</i>	Eastern Thread Snake	Low
Family: Atractaspididae	African Burrowing Snakes	
<i>Atractaspis bibronii</i>	Bibron's Stiletto Snake	Low
<i>Aparallactus capensis</i>	Cape Centipede Eater	Low
Family: Colubridae	Typical Snakes	
<i>Lamprophis capensis</i>	Brown House Snake	Medium
<i>Lycophidion capense</i>	Cape Wolf Snake	Low
<i>Psammophis brevirostris</i>	Short-snouted Sand Snake	Low
<i>Prosymne sundevallii</i>	Sundevall's Shovel-snout	Low
<i>Crotaphopeltis hotamboeia</i>	Herald or Red-lipped Snake	Medium
<i>Telescopus s. semiannulatus</i>	Eastern Tiger Snake	Low
<i>Dasypeltis scabra</i>	Common or Rhombic Egg-eater	Low
Family: Elapidae	Cobras, Mambas and others	
<i>Hemachatus haemachatus</i>	Rinkhals	Low
Family: Viperidae	Adders	
<i>Bitis arietans</i>	Puff Adder	Low
<i>Causus rhombeatus</i>	Rhombic Night Adder	Low

7. FINDINGS AND POTENTIAL IMPLICATIONS

The substrate of this study site does not appear to be particularly suitable for reptiles and amphibians. The listed amphibians are expected to utilise the drainage channel. Few indigenous trees, *Acacia karoo*, occur in the northern section of the study site, but these are not specifically preferred by arboreal species. The substrate is predominantly hard and unsuitable for burrowing. No burrows of small mammals, suitable as retreats, were observed. The moist area and water of the drainage line, including the small dam towards the southwestern edge and the N14 within the 500m extended study area, is suitable as habitat for most of the listed amphibians. However, this does not apply to the Giant Bullfrog, which could only be represented by isolated migrants.

8. LIMITATIONS, ASSUMPTIONS AND GAPS IN KNOWLEDGE

This study site is in an area which has been farmed and the fauna is reasonably well documented. Although the southern part of this study site appears to be covered by natural grassveld, the section northwest of the *Melia sp* alley along the track is seriously disturbed. The general impression is that the potential herpetofauna is poorly represented.

9. RECOMMENDED MITIGATION MEASURES

None

10. CONCLUSION

The sloping terrain and dense grassland do not appear to be particularly suitable for reptiles and amphibians. No Red Data species are expected to occur here. The Giant Bullfrog, recorded from this grid cell, has not been confirmed from this study site and the habitat does not appear suitable. The range of the Southern African Python does not enter this area. The terrain in general is viewed as suitable to support only relatively low population densities of herpetofauna. The normally recommended conservation measures should concentrate on an awareness campaign amongst the labour force, directed at avoiding unnecessary killing and promoting the removal and release of species into nearby undisturbed or conservation areas.

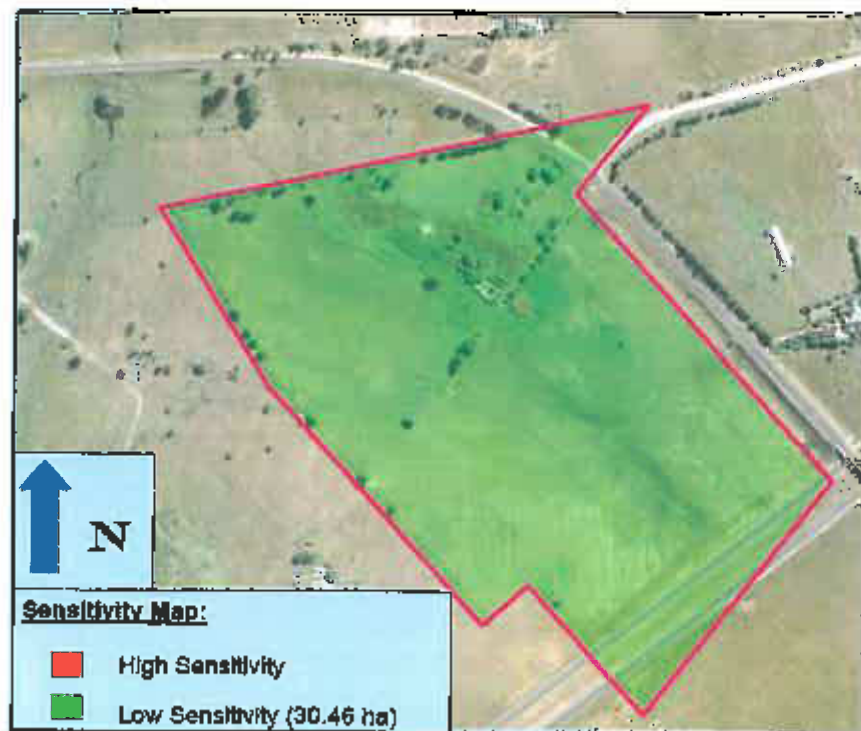


Figure 4: Herpetofauna sensitivity map

Nietgedacht Memo
praf
31/08/2011

From: Conrad Fritz [conrad@tiniebez.co.za] [Add Contact](#)
To: lizelle@mweb.co.za
CC:
Date: 2011-08-31 12:07:34
Subject: Chris Harris - Lanseria Townships

Download All Memo Lanseria Ext 51.pdf (52.7 KB) Memo
Lanseria Ext 53.pdf (57.2 KB) LANSERIA EXTENSION 51
Attachment(s): LAYOUT PLAN - 15 NOVEMBER 2010.pdf (458.6 KB) LANSERIA
EXTENSION 53 LAYOUT PLAN - 18 NOVEMBER 2010.pdf (940.4
KB)

Middag Stephan

Vind aangeheg ons memo's sowel as ons uitleg planne vir voorgestelde Lanseria Uitbreiding 51 and 53.

Kind Regards

Conrad Fritz
Tinie Bezuidenhout Town Planning Consultants

Phone : (011) 467-1004
Fax : (011) 467-1147
e-mail : conrad@tiniebez.co.za

**MEMORANDUM IN SUPPORT OF AN APPLICATION
FOR THE ESTABLISHMENT OF A TOWNSHIP
IN TERMS OF SECTION 96 OF THE
TOWN PLANNING AND TOWNSHIPS ORDINANCE, 1986
(No. 15 OF 1986) :
PORTION 73 AND REMAINDER OF PORTION 27 OF THE FARM
NIETGEDACHT 535 J.Q :
PROPOSED LANSERIA EXTENSION 53**

**TINIE BEZUIDENHOUT AND ASSOCIATES
Town Planning Consultants
November 2010
7092**

1. GENERAL INFORMATION

1.1 Introduction and Property Description

1.1.1 The application seeks to establish a township, subject to certain conditions, in terms of Section 96 of the Town-Planning and Townships Ordinance 1986 (No. 15 of 1986) on Portion 73 and on the Remainder of Portion 27 of the Farm Nietgedacht 535 J.Q (hereinafter referred to as "the site"). The proposed township is to be known as Lanseria Extension 53.

1.1.2 Details of the application are set out under Section 2 hereof.

1.2 Locality (See Plan 7092/1)

The site is located in the north-west corner of the crossing between the N14 Freeway and the K33 Provincial Road.

1.3 Ownership

The ownership details of the properties of the site are as follows:

1.3.1 The Remaining Extent of Portion 27 of the Farm Nietgedacht 535 JQ is registered in the name of **BULT UP ESTATES (PTY) LTD** in terms of Deed of Transfer No. **T 039939/2007**.

1.3.2 Portion 73 of the Farm Nietgedacht 535 JQ is registered in the name of **BULT UP ESTATES (PTY) LTD** in terms of Deed of Transfer No. **T 39940/2007**.

1.4 Size

The site measures 30,2649 Hectares in extent and is made up as follows:

1.4.1 The Remaining Extent of Portion 27 of the Farm Nietgedacht 535 JQ is 17,1300 Hectares in extent.

1.4.2 Portion 73 of the Farm Nietgedacht 535 JQ is 13,1349 Hectares in extent.

1.5 Existing and Surrounding Zoning (See Plan 7092/2)

1.5.1 The site is zoned "Undetermined", in terms of the Peri-Urban Areas Town Planning Scheme, 1975.

1.5.2 Other properties in the vicinity are generally zoned "Undetermined".

2. THE APPLICATION - PROPOSED DEVELOPMENT (See Plan 7092/L1)

2.1 The Applicant's Intention

- 2.1.1 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 spectrum of land uses that can be developed in this advantageous location.
- 2.1.2 It is proposed that there will be 3 erven in the township, which will be consolidated after proclamation.

2.2 Proposed Zoning and Controls

- 2.2.1 Erven 1 to 3 shall be subject to the following zoning and development controls:

Erven 1 to 3:

Use Zone : "Special", including Residential dwelling units, Hotels, Educational, Medical and Social Facilities, Retail, Offices, Entertainment, Motor Trade, Municipal and Government Institutions and Commercial Industrial.

Height : Six Storeys

Coverage : 40%

FAR : 2,4

Parking : As per Scheme

Density : No Density Restrictions

Building Lines : As per Scheme, 5m

General:

1. The development of the site shall be subject to the approval of a Site Development Plan.
 2. Access to the erven shall be to the satisfaction of the City Council.
 3. The three erven shall be consolidated.
-

- 3.1.8 It is highly accessible, both from a regional and intraregional point of view, and is clearly set to become an important economic growth point.
- 3.1.9 The site has excellent regional accessibility via the K29 (R512) and K33 to both the N 14 and N 1 freeways.
- 3.1.10 As a result of the above, the Development Framework for Kya Sand and Lanseria identified the site as falling within the proposed Lanseria Node. Both reports repeatedly emphasize that service delivery in the area is currently not freely available and that the Council need to prioritise the servicing of the area mainly in respect of wet services infrastructure.
- 3.1.11 Since Lanseria Airport has expanded its freight capacity and it has both tourism and employment opportunities there is a need to provide suitable support services in the vicinity of the airport.
- 3.1.12 The development of the site for related mixed uses such as residential, community and business will help create additional employment and social opportunities close to the site.
- 3.1.13 The Municipality through the requirement that a site development plan must be submitted for approval before any development on the site can take place will exercise development control. This plan will have to indicate all the existing and future buildings on the site, landscaped areas, services and buildings restriction areas. This plan ensure that development on the site is desirable and of a good standard.
- 3.1.14 The site in question is located within zone 4B- the Metropolitan Mixed Use Nodal Periphery area. The node in Zone 4B will comprise mainly of high density residential dwelling units, hotels, educational, medical and social facilities, retail, office, entertainment and motor trade businesses, municipal and government institutions and commercial industrial. Therefore it is ideally located for the development of residential, community and business orientated land uses.

3.2 Regional Context

- 3.2.1 The site is situated within a rapidly growing area strategically located in proximity to the Lanseria Airport.
 - 3.2.2 Lanseria and the broader environs, have been characterised by rapid growth, and is the area where a large percentage of all new developments is being created for the Greater Johannesburg Metropolitan areas.
 - 3.2.3 Within this growth sector, a number of non-residential nodes have been established. These nodes provide places of employment in this sector of the city.
-

accessible route, within the precinct, offers a unique development opportunity for additional mixed use developments within the precinct.

- 3.4.3 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.

- 3.4.4 It could be that because of the prominence of the property and the exposure thereof to the K29 Provincial Road (R512) and K33 Provincial Road, 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 the 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 (R512) and K33 Provincial Roads, 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 of the zoning definition.

- 3.4.5 The township will include a Hotel on the property that will cater for accommodation needs that may arise as a result of the proximity of the Lanseria Airport.

It may also be possible to provide a different type of hotel to service the medium to lower end of the tourist market. This has currently not been made provision for in the existing facilities present at the Airport.

- 3.4.6 A component of the proposed development would also be devoted to the

as possible land uses, so as to provide a variety of land use configuration in this location.

It could be that because of the prominence of the property and the exposure thereof onto the K33 Provincial road, a part of the rights will be devoted to the development of motor showrooms to allow for the development of a motor showroom and related workshops.

Due to the site's location in the Lanseria Node and further due to the fact that the site is highly accessible from the surrounding road network, it is a good town planning principle to include a showroom component to form part of the development.

- 3.4.13 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.

A part of the site is well suited to be used as a medical facility as it is going to be surrounded by high density residential suburbs.

Since Riverfield is the nearest medical facility (Hospital) to the site at present it would only be appropriate to develop a medical facility closer to the airport.

- 3.4.14 Educational facilities will permit a residentially-related use on the site which will enhance the amenities in the area and thus improve the functionality of the area. Schools are primarily residential in nature.

The area is close to 3 schools, namely a little farm school, a private college (Heron Bridge College) and a government primary school (Laerskool Nootgedacht).

There will be a need for more additional schools due to the extent by which developments and population increases in the Lanseria area.

- 3.4.15 The development of the property will provide much needed social facilities which will promote the sustainability of this as a healthy and well functioning area, and will increase substantially.

The residential aspect of the neighbourhood if it provides spiritual, of the residents. range of social facilities.

- 3.4.16 The site is extremely well suited for residential uses due to its excellent precinct.

This site, being a large tract of land, is well suited for residentially

RUTH
 27 JUL 2011
 GERRY.
 WIL KESPELMAK MAAK MET
 OMGEWINGSE OR TOE.
 MET HS. H. E. MOTEPO-
 23/24 MAART 15 15!!
 015-295-5633

- * the discouragement of the phenomenon of "urban sprawl" in urban areas,
- * a contribution towards the development of more compact towns and cities, and
- * a contribution towards the correction of the historically distorted spatial patterns of settlement in the Republic, and the optimisation of the use of existing infrastructure in excess of current needs.

3.5.3 As a consequence, it is submitted that the concepts of need and desirability must now be applied in terms of the General Principles laid down by the DFA. It is the official government policy, approved after a process of public participation, which must take precedence over outdated local land use policies.

3.5.4 The proposed density also complies with the Regional Spatial Development Plan for the area.

3.5.5 The site 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".

3.5.6 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).

3.5.7 The intervention for objective 1 states to "encourage mixed land uses that compliment one another, as per the land management zone".

3.5.8 One of the guidelines for objective 1 states that Land Use Management Standards as contained in the Land Use Management Schedule must apply.

3.5.9 In terms of the Kya Sand and Lanseria Development Framework the site falls inside the Metropolitan mixed-use nodal periphery (Zone 4B). According to the Land use Management Schedule in the Framework the node will support high density residential dwelling units, hotels, educational, medical and social facilities, retail, office, entertainment and motor trade businesses, municipal and government institutions and commercial industrial.

3.5.10 Another guideline of objective 1 state that community facility's such as religious buildings, medical suites, places of instruction and other related uses suitable in core residential areas can be allowed.

3.5.11 According to the GMS the site falls inside the expansion areas.

4. SUMMARY AND CONCLUSION

- 4.1 The application seeks to establish a township, subject to certain conditions, in terms of Section 96 of the Town-Planning and Townships Ordinance 1986 (No. 15 of 1986) on Portion 73 and on the Remainder of Portion 27 of the Farm Nietgedacht 535 J.Q. The proposed township is to be known as Lanseria Extension 53.
 - 4.2 The application site is located at an optimum position (relative to both surrounding land usage and the existing and proposed road system) to accommodate such development, and is ideally suited thereto and also because of its location close to Lanseria Airport .
 - 4.3 The need and desirability of the proposed mixed use development has been proved, as the site is well located with regard to accessibility, suitability markets and existing development areas.
 - 4.4 The application represents a golden opportunity for the site to be developed in terms of its highest potential, at an appropriate scale in an economically viable way.
 - 4.5 This application complies with a number of the General Principles of the DFA, the Spatial Development Framework as well as the Lanseria Development Framework 2020 and should therefore be supported.
 - 4.6 It is therefore respectfully submitted that the present application is both necessary and desirable and worthy of approval.
 - 4.7 The proposed development will ensure the development of the site to its maximum potential, with specific reference to its location.
 - 4.8 We therefore respectfully request that the application be approved as submitted.
-

lanseria x 53. → Professional.

2



BIGGEN
AFRICA

Lanserria Development Node

Developer's Presentation

25 July 2012



Wednesday, October 24, 2012

"Doing Good While Doing Business"

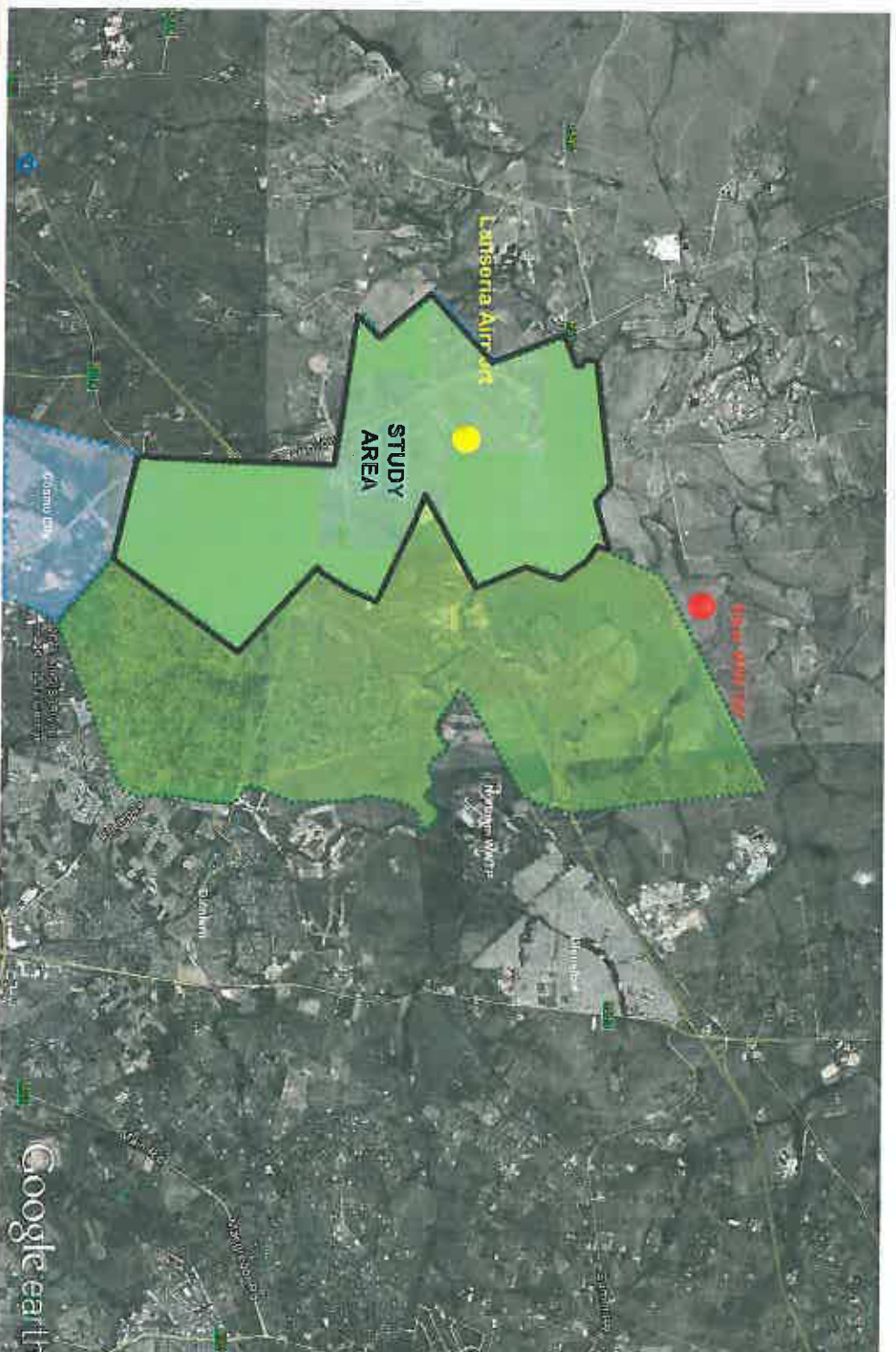


24 Oct 2012



**BIGGEN
AFRICA**

Lanseria and the Urban Edge



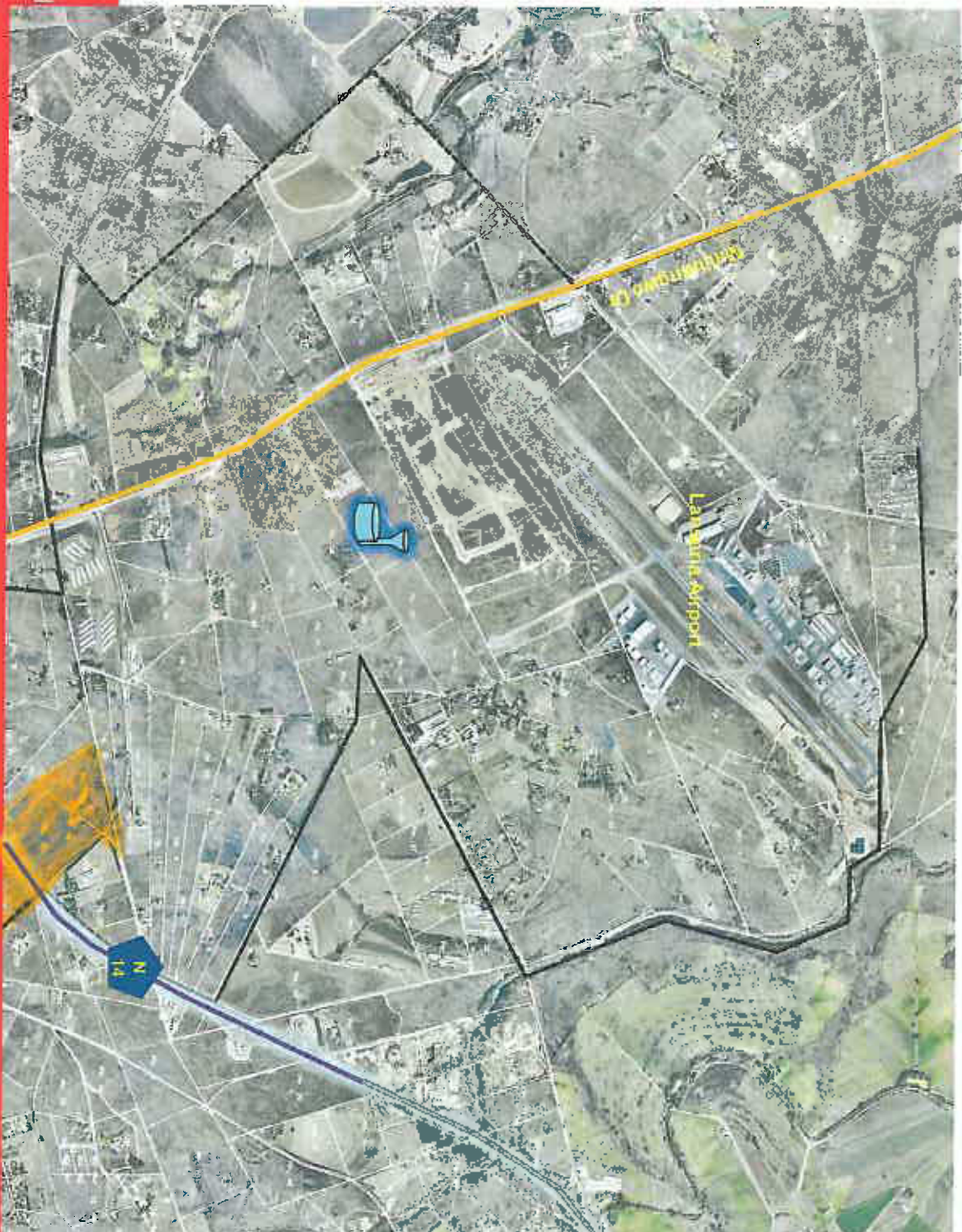
Wednesday, October 24, 2012





**BIG BEN
AFRICA**

Existing Water Infrastructure and current initiatives



Web



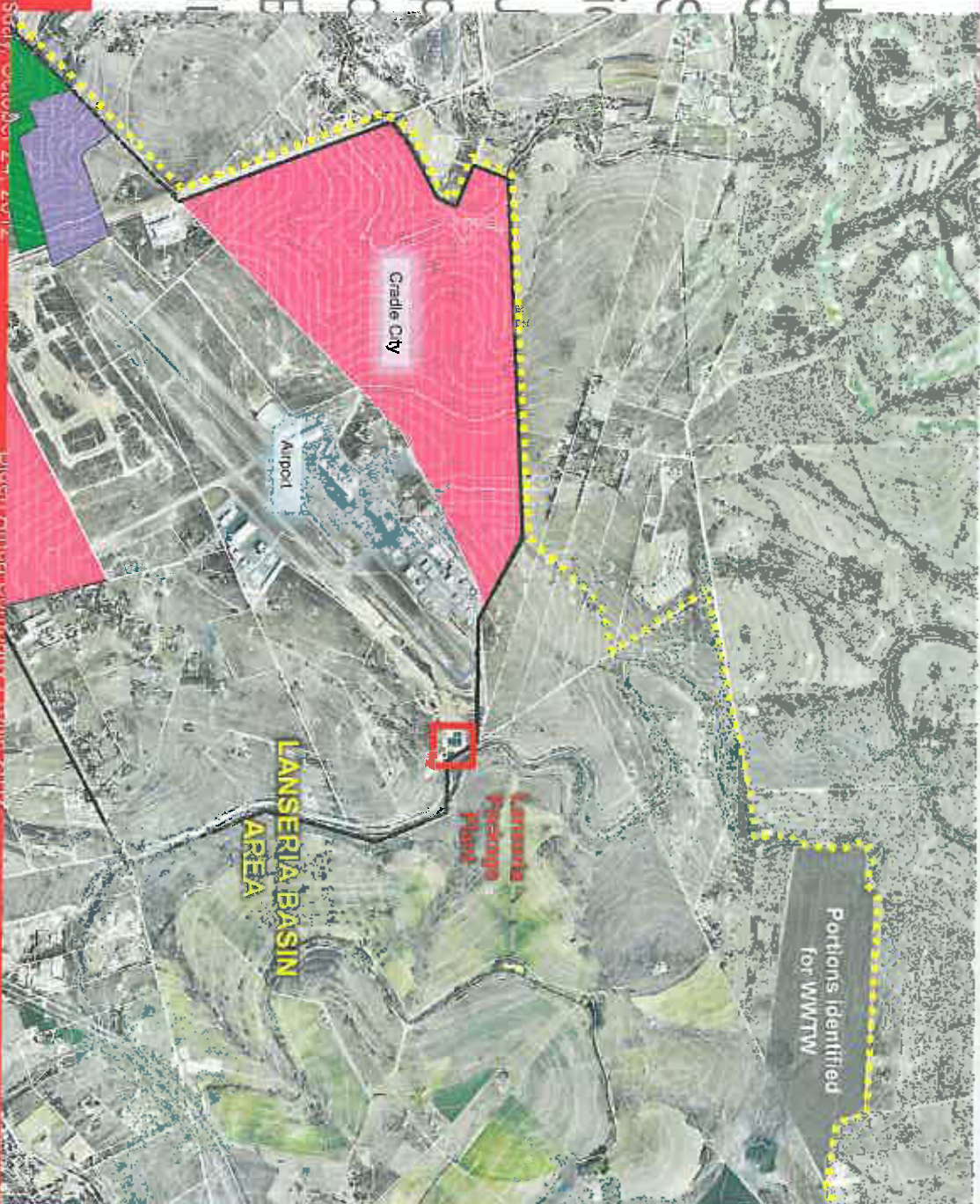
Water Infrastructure upgrades required (cont.)

- [illegible]



**BIGGEN
AFRICA**

Existing Sewer Infrastructure and current initiatives



Portions Identified
for WWTW

LANSERIA BASIN
AREA

Cradle City

Airport

Lanseria
Reservoir

Wednesday, October 27, 2010

Biggen Africa Company Private Ltd



**BIGHEN
AFRICA**

Sewer Infrastructure upgrades required Southern Areas

- Bulk Sewer Requirements*:

1. Construction of section of outfall main (250mm/315mm) = R1,44mil
2. Construction of temporary pump station and rising main = R2,78mil
3. Construction of outfall sewer (200/315/450/1350mm d.a) = R27,6mil

- TOTAL REQUIREMENT FOR
AREA = R31,82mil*

* All figures as per GLS report escalated to July 2012 (includes P&G's and Contingencies but excludes Fees and VAT)



Wednesday, October 24, 2012





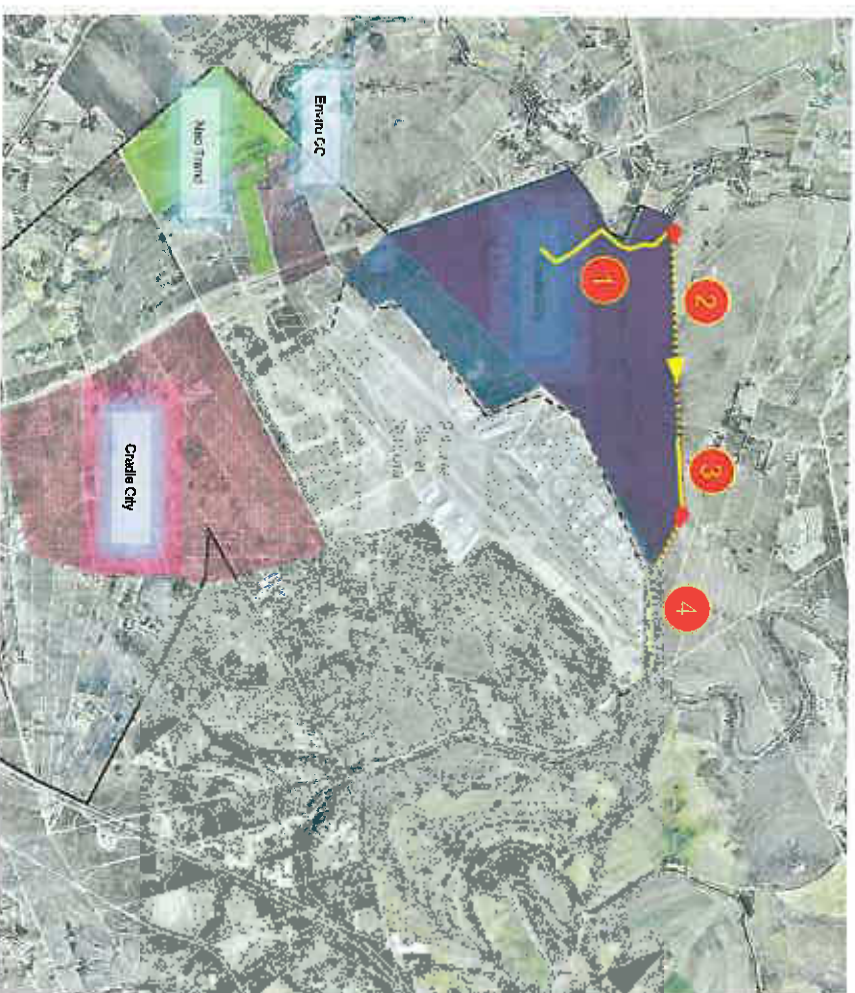
Sewer Infrastructure upgrades required Northern Areas

- Bulk Sewer Requirements*:

1. Construction of Gravity main (250/315mm dia) = R1,2mil
2. Construction of Pump Station and rising main = R4,49mil
3. Construction of Section of Gravity sewer = R0,58mil
4. Construction of Temporary pumpstation and rising main (to serve 3% of development as interim) = R3,1mil

- TOTAL REQUIREMENT FOR
AREA = R9,37mil*

* All figures as per GLS report escalated to July 2012 (includes P&G's and Contingencies but excludes Fees and VAT)





Total Bulk Wet Services Requirement vs. Contributions

- Total Infrastructure to be installed to unlock developments
 - Water Pipelines, fittings and Reservoirs = R 96,5mil
 - Sewer Collectors, Pump Stations and Rising Mains = R 55,9mil (excluding modules of package plants as and when required)
- Bulk Contribution Payable as per usage
 - Water = R2,458/kI
 - Sewer = R5,973/kI
- Above figures used with estimated usage based on land use tables provided by Developers within the catchment:





Conclusion and Way forward

- Contributions sufficient to fund infrastructure required under Master Plan
- Usage of surplus to be agreed upon with Johannesburg Water
 - Construction of outfall sewers
 - Contribution towards WWTW
- Solution to be phased and construction of infrastructure to be staged for implementation of scheme over duration of development of the area
- Planned dates for commencement and planned construction time to be provided to develop a phased implementation plan





**BIG BEN
AFRICA**

Accounting and Programme

- Project Accounting up to date:
 - Time cost up to 24 July 2012 = R 87,000
 - Estimated cost up to submission of prefability = R ???
- Project Invoicing
- Estimated timeframes



Wednesday, October 24, 2012



prg

29 Aug 2011

X53



Scientific Aquatic Services

Applying science to the real world

347 Highland Road, Kensington, 2094

Tel 011 616 7893

Fax 011 615 4106

Cell 083 415 2356

admin@sasenvironmental.co.za

gee vi Thabi

Name: Stephen van Staden

Date: Monday, 29 August 2011

Ref: SAS/BOK 290811

Bokamoso Landscape Architects and Environmental Consultants

Tel: 012 346 3810

Fax: 012 460 7079

E-mail: lizalleg@mweb.co.za

Attention: Mr. G. Gerike

Dear Madam,

Waar gaan die? Wat reigende?

PROPOSAL FOR THE DELINEATION OF THE WETLAND AND RIPARIAN AREAS ON PORTIONS 27 AND 73 OF THE FARM NIETGEDACHT 535 JQ

I would like to thank you for the opportunity to provide you with a proposal for the studies required at the abovementioned site. The sections below will define the scope of work as understood by Scientific Aquatic Services and will present the budget and project management aspects of the study.

SCOPE OF WORK

Delineation of the wetland resources on the subject property will take place according to "DWAF, 2005: A practical Guideline Procedure for the Identification and Delineation of Wetlands and Riparian Zones" as Advocated by GDACE. Aspects such as soil morphological characteristics, vegetation types and wetness will be used to delineate the various zones of the wetland (permanent and temporary) according to the guidelines. The buffer zone will then be delineated around the wetland. Recommendations for mitigating impacts (if any) on the receiving aquatic environment will also be provided. Should wetland conditions occur, the system will be assessed in terms of its PES as well as its functions in terms of ecological and socio-economic service provision according to the protocol of DWAF (1999) and Kotze et al (2005) Respectively.

The table below serves as an indication of the budgets for the work according to the scope of work set out above.

Handwritten signature and stamp at the bottom of the page.

Table 1. Project budget summary.

Component	Cost
Wetland and buffer zone delineation	
Fieldwork	R 4 725.00
Define wetland PES and EIS	R 2 300.00
Reporting and mapping	R 4 600.00
Sub-total	R 11 625.00
Disbursements	
Travel costs	R 585.00
Miscellaneous disbursements, postage and petties	R 112.50
Subtotal	R 697.50
BUDGET	R 12 322.50
VAT	R 1 725.15
TOTAL BUDGET	R 14 047.65

WHY SCIENTIFIC AQUATIC SERVICES?

1. All work is carried out or oversee by a **registered Professional Natural Scientist**
2. Staff at Scientific Aquatic Services are **Members of the Gauteng Wetland Forum**
3. Staff at Scientific Aquatic Services are members of the South African Soil Surveyors Association
4. Scientific Aquatic Services have **extensive experience in wetland delineation and assessment**
5. Scientific Aquatic services will strive to maintain **open communication channels** in order to allow for constructive input from stakeholders into the documentation.
6. Scientific Aquatic Services will strive to ensure the highest **quality of documentation** in order to ensure that reports are concise, yet informative and that they are written in such a way that will allow for easy interpretation by readers and that the **needs of stakeholders requiring the information are met.**

PROJECT ASSUMPTIONS

PROJECT ASSUMPTIONS AND COMMERCIAL TERMS AND CONDITIONS

This project will be run as a fixed budget contract. A 50% deposit will be required prior to the commencement of the project. The final payment will be due upon submission of an executive summary to the EAP. No submission of final documents will take place prior to receiving payment in full.

The study will take approximately 3 weeks to complete with 1 day required on site by 2 assessors.

Please refer to the Scientific Aquatic Services general terms and conditions of business in appendix A at the end of this document.

We trust we have interpreted your requirements correctly. Please do not hesitate to contact us if there are aspects of our proposal that you would like to discuss further.

Yours Faithfully,

Digital Documentation Not Signed For Security Purposes

Stephen van Staden





Scientific Aquatic Services
Applying science to the real world
91 Goldenhuis Road, Malvern East, Ext 1
Tel 011 616 7893
Fax 011 616 4106
Cell 083 416 2366
admin@sasenvironmental.co.za

PROPOSAL ACCEPTANCE INFORMATION FORM

Please complete and return this form to admin@sasenvironmental.co.za or +27 11 616 4106

Proposal Reference Number:	SAS BOK 390811
Project Name:	Metgedacht 535 JQ Ptn 27 and 73
Project description:	Wetland delineation
Order Number from Client: (attach copy of order)	
Budget: (including VAT)	R14,047.65
Proposal accepted (Please mark with X)	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
CLIENT DETAILS	
Corporate Company Name:	EXTENSION OF COMMERCIAL CASINO Co. (Pty) Ltd
Lead Consultant (EAP):	As above
Company Responsible for Account:	As above
Company Registration Number:	1988/CC/1140107
VAT Registration Number:	4560157905
Client Market Sector:	Urban Development
Client Postal Address:	Client Physical Address:
PO Box 651099	5 Wessels Rd
BENJONKE	BRONIA
Postal Code: 2010	Postal Code: 2128
Tel Number:	
Fax Number:	
PROJECT LOCATION/INFORMATION	
Site Name:	Metgedacht 535 JQ Ptn 27 and 73
Nearst Town:	Johannesburg
Province:	Gauteng
Country:	South Africa
CONTACTS	
Contact Person on Client Site:	
Project Manager:	
Tel Number:	
Fax Number:	
E-mail address:	
Accounts Contact Name:	
Tel Number:	
Fax Number:	
E-mail address:	
CONTRACTUAL INFORMATION	
Signature (must be authorised to sign)	Date 8/12/2011
By signing this document you agree that the client accepts all terms and conditions of the relevant proposal	
Invoicing format & timing:	50% deposit and upon submission of exec summary
Contractual payment terms:	30 days
Method of payment:	Cheque
(Mark with X)	Electronic



1004 X 55
Stephan Barkhuizen

From: Ontvangs
Sent: 23 May 2011 10:22 AM
To: Mientjie Coetzee; Stephan Barkhuizen
Subject: FW: Nietgedacht executive summary and flora report
Attachments: Nietgedacht ptns 27 & 73 - executive summary.pdf; Nietgedacht ptns 27 & 73 - App A Flora.pdf

Elsa Viviers
Partners/on behalf of
Lizelle Gregory

Barkhuizen

Environmental Consultants &
Landscape Architects

Tel: 27 (0) 346 4810 | F: 27 86 570 5059 | C: 083 2558384
ed@ellego.co.za | 364 Nelson Mandela Road, Shalea, Port Elizabeth



From: Vanessa Marais [mailto:vanessam@lantic.net]
Sent: 21 May 2011 10:41 AM
To: 'Lizelle Gregory'
Subject: Nietgedacht executive summary and flora report

Hi Mientjie / Stephan

Aangeheg die Nietgedacht flora verslag en executive summary

ete

Vanessa Marais
Galago Environmental CC
638 Turf Street, Wingate Park, 0181
Tel: 012-345 4891
Fax: 086 675 6136
Cell: 082 322 5688



LANSERIA X51 & X53 DEVELOPMENT

PRELIMINARY ENGINEERING DESIGN REPORT

TABLE OF CONTENTS

<u>Item</u>	<u>Description</u>	<u>Page No.</u>
1	INTRODUCTION	2
1.1	Purpose of the Report	2
1.2	Background	2
2	SITE DESCRIPTION	2
2.1	Locality	2
2.2	Supply Authority	2
3	ELECTRICAL SUPPLY	3
3.1	Capacity of Existing Primary and Secondary Electrical Infrastructure	3
3.1.1.	Bulk Electrical Infrastructure	3
3.1.2.	Future Planned Bulk Upgrades	3
3.2	Bulk Requirements	4
3.3	Bulk Supply to the Development	5
4	ELECTRICAL DESIGN	5
4.1	Medium Voltage Reticulation	5
4.2	Low Voltage Reticulation	6
4.3	Street and Area Lighting	6
4.4	Telecommunication	6
5	ESTIMATE CONSTRUCTION COST	7
5.1	Funding Requirements	7

APPENDICES

Appendix A1: Locality Plan

1 INTRODUCTION

Bigen Africa Services has been requested to investigate the availability of electrical bulk supply and to determine internal design criteria for the proposed Lanseria X51 & X53 project. All the design philosophies stated in this report are subject to approval by Eskom.

1.1 Purpose of the Report

The purpose of this report is to provide information regarding the following.

- Existing electrical infrastructure,
- Bulk supply to the development,
- Internal electrical design; and
- Cost estimate for the development.

1.2 Background

The proposed Lanseria X51 & X52 will be zoned as "special", indicating a mix between residential, commercial and light industrial land-use . parcel. Road reserves are estimated at 20% of the total land use

2 SITE DESCRIPTION

2.1 Locality

The location of the proposed Lanseria X51 & X53 is along the southern boundary of the K33 at co-ordinates 25 58 21.7 E27 55 51.3 The development is situated within the urban boundary of the City of Johannesburg.

2.2 Supply Authority

The electrical supply authority in the area is Eskom.