

Final Basic Assessment Report for the Proposed Cattle Feedlot

Part of Portion 47 of the farm Brandbach 471 JR, Cullinan



Reference No: Gaut: 002/12-13/E0222

March 2014



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Application Form GDARD
—
Environmental Authorisation

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



Gauteng Department of Agriculture and Rural Development

Application for authorisation in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended and the Environmental Impact Assessment Regulations, 2010 (Version 1)

Kindly note that:

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

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

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

DEPARTMENTAL DETAILS

Gauteng Department of Agriculture and Rural Development
Attention: Administrative Unit of the Sustainable Utilisation of the Environment (SUE) Branch
P.O. Box 8769
Johannesburg
2000

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

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

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

(For official use only)

File Reference Number:

Application Number:

Date Received:

1. NATURE OF THE ACTIVITY

The establishment of a Cattle Feedlot and the temporary storage of manure in stockpiles.

Select the appropriate box with regards to the application form submission

An application for conducting a basic assessment (as defined in the regulations)?

X

A resubmission of an application for conducting a basic assessment (as defined in the regulations)?

An application for conducting a Scoping & EIA process (as defined in the regulations)

A resubmission of an application for conducting a SR & EIA process (as defined in the regulations)

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

--

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

YES	NO
YES	NO

If yes will the application contain new or additional material not submitted previously

To be noted that Regulation 68 of EIA Regulations, 2010 states that no applicant may resubmit an application which is substantially similar to an application previously denied authorisation by the relevant authority unless 3 years has lapsed since the refusal or new material is to be presented

2. PROJECT DETAILS

Project title:

Proposed Cattle Feedlot on Part of Portion 47 of the farm Brandbach 471 JR, Cullinan

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

Local authority(ies) in whose jurisdiction the proposed application will fall

City of Tshwane

3. ACTIVITY POSITION

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

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

Alternative:	Latitude (S):	Longitude (E):
Refer to Annexure A, Figure 2 – Aerial Map	1) 25°36'57.21"S	28°38'51.07"E
	2) 25°37'0.7"S	28°38'56.36"E
	3) 25°37'4.78"S	28°38'52.78"E
	4) 25°37'11.37"S	28°39'2.31"E
	5) 25°37'23.28"S	28°38'50.84"E
	6) 25°37'18.92"S	28°38'46.11"E
	7) 25°37'13.03"S	28°38'51.45"E
	8) 25°37'6.83"S	28°38'42.62"E

In the case of linear activities:

Alternative:

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

Latitude (S):	Longitude (E):
°	°
°	°
°	°

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

Addendum of route alternatives attached

Property description:

Part of Portion 47 of the farm Brandbach 471 JR, Cullinan

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

4. ACTIVITIES APPLIED FOR

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

The establishment of a Cattle Feedlot that can accommodate 4000 cattle. The farm on which the feedlot will be located is approximately 533 ha, however the feedlot will only be established on a section of the farm. The study area is approximately **19.9 ha** in extent.

The temporary storage of manure in manure stockpiles. The manure will be worked into the soil of the cultivated areas.

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

Listing Notice 1

Listing Notice 2

Listing Notice 3

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

N/A

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

Indicate the number and date of the relevant Government Notice:	Activity No (s) (in terms of the relevant notice): e.g. Listing notices 1, 2 or 3	Describe each listed activity as per the wording in the relevant listing notice:
R. 544, 18 June 2010	Listing Notice 1	<p>Activity 4 The construction of facilities or infrastructure for the concentration of animals for the purpose of commercial production in densities that exceed-</p> <ul style="list-style-type: none"> • 20 square metres per large stock unit and more than 500 units per facility • 8 square metres per small stock unit and;

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

		<p>a. more than 1000 units per facility excluding pigs where (b) will apply;</p> <p>b. more than 250 pigs per facility excluding piglets that are not yet weaned;</p> <p>Reason for inclusion: The proposed abattoir will cater for 4000 cattle.</p>
R. 544, 18 June 2010	Listing Notice 1	<p>Activity 9 The construction of facilities or infrastructure exceeding 1000m in length for the bulk transportation of water, sewage or stormwater –</p> <p>(i) with an internal diameter of 0,36m or more;</p> <p>or</p> <p>(ii) with a peak throughput of 120 l per second or more.</p> <p>excluding where</p> <p>(a) such facilities or infrastructure are for bulk transportation of water, sewage or stormwater drainage inside a road reserve; or</p> <p>(b) where such construction will occur within urban areas but further than 32m from a watercourse, measured from the edge of the watercourse.</p>
R. 544, 18 June 2010	Listing Notice 1	<p>Activity 22 The construction of a road outside urban areas,</p> <p>(i) with a reserve wider than 13,5 meters or;</p> <p>(ii) where no reserve exists where the road is wider than 8 metres, or</p> <p>(iii) for which an environmental authorisation was obtained for the route determination in terms of activity 5 in Government Notice 387 of 2006 or activity 18 in Notice 545 of 2010.</p>
R. 544, 18 June 2010	Listing Notice 1	<p>Activity 23 The transformation of undeveloped, vacant or derelict land to –</p> <p>(i) residential, retail, commercial, recreational, industrial or institutional use, inside an urban area. And where the total area to be transformed is 5 hectares or more, but less than 20 hectares, or</p> <p>(ii) residential, retail, commercial, recreational, industrial or institutional use, outside an urban area and where the total area to be transformed is bigger than 1 hectare but less than 20 hectares; -</p> <p>except where such transformation takes place for linear activities.</p>

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

5. OTHER AUTHORISATIONS REQUIRED

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

- | | |
|--|--------|
| 4.1.1 National Environmental Management: Waste Act | Yes/No |
| 4.1.2 National Environmental Management: Air Quality Act | Yes/No |
| 4.1.3 National Environmental Management: Protected Areas Act | Yes/No |
| 4.1.4 National Environmental Management: Biodiversity Act | Yes/No |
| 4.1.5 Mineral Petroleum Development Resources Act | Yes/No |
| 4.1.6 National Water Act | Yes/No |
| 4.1.7 National Heritage Resources Act | Yes/No |
| 4.1.8 Other (please specify) | Yes/No |
| 4.2 Have such applications been lodged already? | Yes/No |

6. BACKGROUND INFORMATION

Project applicant:

Mlekis Beef

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

Trading name (if any):	Mlekis Beef		
Contact person:	Lucas Msiza / Kobus Marais (Mentor)		
Physical address:	Portion 47 of the farm Brandbach 471 JR, Cullinan		
Postal address:	P.O. Box 278, Magaliesburg		
Postal code:	1791	Cell:	083 375 2596
Telephone:	011 974 0309	Fax:	011 974 0464
E-mail:	marais_linda@yahoo.com		

Project Environmental Assessment Practitioner:	Bokamoso Landscape Architects and Environmental Consultants CC		
Contact person:	Lizelle Gregory		
Postal address:	P.O. Box 11375, Maroelana		
Postal code:	0161	Cell:	083 255 8384
Telephone:	012 346 3810	Fax:	086 570 5659
E-mail:	lizelleg@mweb.co.za		

EAP qualifications & relevant experience

Registered Landscape Architect and Environmental Consultant (degree obtained at the University of Pretoria) with 17 years experience in the following fields:

- Environmental Planning and Management;
- Landscape Architecture; and
- Landscape Contracting

L. Gregory also lectured at the Tshwane University Technology and the University of Pretoria.

Professional affiliation(s) (if any)

Lizelle Gregory is a registered member of the South African Council of the Landscape Architects Profession (SACLAP), the International Association of Impact Assessments (IAIA), and The Institute for Landscape Architects South Africa (ILASA) and the Institute of Environmental Management and Assessment (IEMAS).
Her professional practise number is: 97078

Landowner:	National Government Republic of South Africa		
Contact person:	Lucas Msiza		
Postal address:	P.O. Box 278, Magaliesburg		
Postal code:	1791	Cell:	083 375 2596
Telephone:	011 974 0309	Fax:	011 974 0464
E-mail:	marais_linda@yahoo.com		

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

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

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

Local authority in whose jurisdiction the proposed activity will fall:	City of Tshwane		
Contact person:	Livhuwani Siphuma		
Postal address:	Private Bag 1454, Pretoria		
Postal code:	0001	Cell:	
Telephone:	012 358 8871	Fax:	012 358 8934
E-mail:	livhuwanis@tshwane.gov.za		

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

List of local authorities is attached No

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

List of properties is attached No

Town(s) or district(s): City of Tshwane Metropolitan Municipality
Street/Physical address: Portion 47 of the farm Brandbach 471 JR, Cullinan

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

List of towns or districts is attached No

State Departments administering a law affecting the environment:

List attached as Annexure C

Contact person:

Postal address:

Postal code:

Telephone:

E-mail:

Cell:
Fax:

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

Current land-use zoning: Agricultural

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

List of current land use zonings is attached No

Locality map:

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

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

7. COMPLIANCE WITH CONDITIONS

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

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

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

N/A

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

8. ACTIVITY INFORMATION

Socio-economic value of the activity

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

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

Will the activity contribute to service infrastructure?

Will the activity contribute to a public amenity

R30 000 000,00	
R24 000 000,00	
YES	NO
YES	NO

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

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

50
10

Of these opportunities how many are:

Women

People with disabilities

Female

Male

Youth

Female

Male

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

What percentage of this will accrue to previously disadvantaged individuals?

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

0
0

0
0

R1 800 000,00
R1 500 000,00

50
10

Of these opportunities how many are:

Women

People with disabilities

Female

Male

Youth

Female

Male

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

What percentage of this will accrue to previously disadvantaged individuals?

10
0

0
0

0
0

0
0

R18 000 000
75%

Need and desirability of the activity

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

The agricultural sector in South Africa plays a valuable role in ensuring the sustainable supply of food to our growing population and represents one of the main sources of revenue. The feedlot is perfectly located in close proximity of an abattoir in a Gauteng Agricultural Hub. There is sufficient water supply for the feedlot. It is in line with the municipality's plan for agriculture.

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

The agricultural sector in South Africa plays a valuable role in ensuring the sustainable supply of food to our growing population and represents one of the main sources of revenue. The feedlot has economical benefit for society in general.

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

The feedlot supplies job opportunities to local communities and additional work for contractors in the area. Increase in supply of good quality meat.

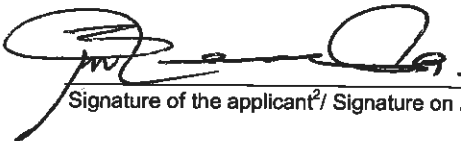
9. DECLARATIONS

The Applicant

I, Lucas Msiza, declare that I -

am¹, the applicant in this application for **Proposed Cattle Feedlot on Part of Portion 47 of the farm Brandbach 471 JR, Cullinan**

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



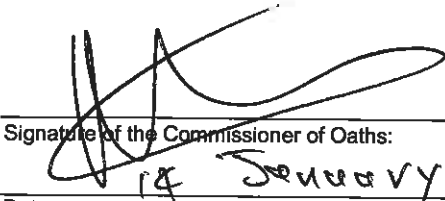
Signature of the applicant²/ Signature on behalf of the applicant:

MLEKIS BEEF

Name of company (if applicable):

14 JANUARY 2013

Date:



Signature of the Commissioner of Oaths:

14 JANUARY 2013

Date:

CA(SA)

Designation:

Commissioner of Oaths Official stamp (below)

LEONARD THEO GREGORY
COMMISSIONER OF OATHS
36 LEBOMBO ROAD
ASHLEA GARDENS
PRETORIA 0081
CHARTERED ACCOUNTANT OF SOUTH AFRICA

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

² If the applicant is a juristic person, a signature on behalf of the applicant is required as well as proof of such authority.

ADDENDUM A

10. DECLARATIONS³

The Environmental Assessment Practitioner;

- I, Lizelle Gregory, declare under oath that I –
- act as the independent environmental practitioner for this application **Proposed Cattle Feedlot on a Portion of Portlon 47 of the farm Brandbach 471 JR, Cullinan**
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
 - I declare that there are no circumstances that may compromise my objectivity in performing such work;
 - I have expertise in conducting environmental impact assessments, including knowledge of the Act, regulations and any guidelines that have relevance to the proposed activity;
 - I will comply with the Act, regulations and all other applicable legislation;
 - I will take into account, to the extent possible, the matters listed in regulation 8 of the regulations when preparing the application and any report relating to the application;
 - I have no, and will not engage in, conflicting interests in the undertaking of the activity;
 - I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
 - I will ensure that information containing all relevant facts in respect of the application is distributed or made available to interested and affected parties and the public and that participation by interested and affected parties is facilitated in such a manner that all interested and affected parties will be provided with a reasonable opportunity to participate and to provide comments on documents that are produced to support the application;
 - I will ensure that the comments of all interested and affected parties are considered and recorded in reports that are submitted to the competent authority in respect of the application, provided that comments that are made by interested and affected parties in respect of a final report that will be submitted to the competent authority may be attached to the report without further amendment to the report;
 - I will keep a register of all interested and affected parties that participated in a public participation process; and
 - I will provide the competent authority with access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not
 - all the particulars furnished by me in this form are true and correct;
 - will perform all other obligations as expected from an environmental assessment practitioner in terms of the Regulations; and
 - I realise that a false declaration is an offence in terms of regulation 71 and is punishable in terms of section 24F of the Act.

For Scoping/ EIA applications I further declare under oath that

- I will fix the site notice(s) in a conspicuous place, on the property(ies) where it is intended to undertake the activity(ies)
- I will place a notice in the required newspaper(s)
- I will provide the following with all the project information and give I&AP's an opportunity to register as an I&AP
 - landowners and occupiers of adjacent land
 - landowners and occupiers of land within 100 metres of the boundary of the property
 - the ward councillor
 - any organisation that represents the community in the area of the application
 - the municipality which has jurisdiction over the area in which the proposed activity will be undertaken
 - any organ of state that may have jurisdiction over any aspect of the activity of the applicant's intention to submit an application to the competent authority; and
- I will include on the register all persons as required per Regulation 55 (1) (c)
- The Reports as submitted will contain the same information (including layout, project design and mitigation) as provided to the registered I&APs for comment
- All issues raised by the I&APs during the public participation process will be included in the Comments and Response Report as attached

³ Addendum A must be completed and submitted with the report if application form was done and submitted by the applicant.

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


Signature of the Environmental Assessment Practitioner:

BOKAMOSO LANDSCAPE ARCHITECTS AND ENVIRONMENTAL CONSULTANTS
Name of company:

14 JANUARY 2013
Date:


Signature of the Commissioner of Oaths:

14 January 2013
Date:

CA (SA)
Designation:

Commissioner of Oaths Official stamp (below)

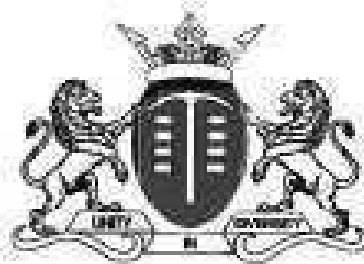
LEONARD THEO GREGORY
COMMISSIONER OF OATHS
36 LEBOMBO ROAD
ASHLEA GARDENS
PRETORIA 0081
CHARTERED ACCOUNTANT OF SOUTH AFRICA

11. CHECKLIST

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

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

Acknowledgement Letters From GDARD



agriculture and rural development

Department: Agriculture and Rural Development
GAUTENG PROVINCE

Diamond Corner Building, 68 Duff & Market Street, Johannesburg.
P O Box 8769, Johannesburg, 2008

Telephone: (011) 355-1900

Fax: (011) 355-1900

Website: <http://www.gard.agr.gov.za>

Reference:	Gaut: 002/12-13/E0222
Enquirer:	Faith Mambo
Telephone:	(011) 355-1974
Email:	Faith.mambo@gauteng.gov.za

Bokamoso Landscape Architects and Environmental Consultants

Fax no. 086 570 5659

PER FACSIMILE

Dear Sir / Madam

**Application for Environmental Authorisation: Proposed Cattle Feedlot on Part of
Portion 47 of the farm Brandhoek 471 JR, Cullinan**

The Department acknowledges having received the application form for environmental authorisation of the above-mentioned project on 15/01/2013.

The application has been assigned the reference number Gaut: 002/12-13/E0222. Kindly quote this reference number in any future correspondence in respect of the application.

Please circulate the draft report to any state department that administers a law relating to a matter affecting the environment to comment.

You are required to submit two (2) copies (full colour CDs-PDF) of the Draft Basic Assessment Report as well as proof of submission to state departments referred to above.

In order to determine whether a biodiversity assessment is required and, if so, which specialist studies are required, please send a shapefile (WGS84 datum; geographic co-ordinate system) of the application site to our biodiversity information service (GDACE_BiodiversityInfo@gauteng.gov.za), the e-mail clearly indicating the project

reference number. Where biodiversity assessment is required; please ensure that it is conducted consistent with the *GDACE Requirements for Biodiversity Assessments*. A copy of this document can be obtained by e-mailing GDACE_BiodiversityInfo@gauteng.gov.za

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

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

Yours faithfully


Boniswa Belot
Deputy Director, Strategic Administration Support
Date: 14/01/2013

CC: Mlekia Beef

Att: Lucas Mzisa
Tel: 011 974 0309
Fax: 011 974 0464



agriculture and rural development

Department: Agriculture and Rural Development
GAUTENG PROVINCE

Diamond Corner Building, 68 Eloff & Market Street, Johannesburg
P O Box 8769, Johannesburg, 2000

Telephone: (011) 355-1900

Fax: (011) 355-1000

Website: <http://www.gdard.gpg.gov.za>

Reference:	002/12-13/E0222
Enquiries:	Faith Mlambo
Telephone:	(011) 355-1974
Email:	Faith.mlambo@gauteng.gov.za

Bokamoso Landscape Architects and Environmental Consultants

Email/Fax. lizelleg@mweb.co.za

Dear Sir / Madam

**Draft Basic Assessment Report: Proposed Cattle Feedlot on Part of Portion 47 of the farm
Brandbach 471 JR, Cullinan**

The Department acknowledges having received the Draft Basic Assessment Report for environmental authorisation of the above-mentioned project on 02/08/2013.

You are required to submit five (5) copies (3 full colour hard copies and 2 CDs-PDF) of the Final Basic Assessment Report.

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

Yours faithfully

uBew
Boniswa Belot
Deputy Director: Strategic Administration Support
Date: 23/08/2013
CC: Mlekis Beef

Att: Lucas Mzisa
Email/Fax: marais_linda@yahoo.com

Correspondence with GDARD

LEBOMBO GARDENS BUILDING
38 LEBOMBO ROAD
ASHLEA GARDENS
0081

P.O. BOX 11375
MAROELANA
0161

Tel: (012) 346 3810
Fax: 086 570 5659
E-mail: lizelleg@rivweb.co.za
Website: www.Bokamoso.biz



Landscape Architects, Environmental Consultants,
Environmental Auditing, Water License Applications

**Gauteng Department of Agriculture
SUE Admin
Ground floor
Diamond Building
11 Diagonal Street
Johannesburg
2000**

**ATTENTION: Justine Chan
Tel: 011-240 3048**

30 January 2014

**RE: THE PROPOSED CATTLE FEEDLOT WITH MANURE STORAGE AND
COMPOSTING FACILITY(S) ON PART OF PORTION 47 OF THE FARM
BRANDBACH 471 JR, CULLINAN
(GAUT: 002/12-13/W0047)**

The Waste License application of the above-mentioned project has reference.

The proposed project is in the process of obtaining environmental authorization for the construction of facilities for the cattle feedlot and in the same process it applied for a waste license to accommodate for the storing and application of animal manure. However, on 29 November 2013 the listed activities of the National Environmental Management Waste Act 2008 (Act no 59, 2008) changed as per Government Notice 921 in Government Gazette 37083. Due to this notice some of the activities are no longer triggered and can be excluded from the waste license application.

In addition to acknowledging the new Waste Management activities it is now understood that animal manure is not regarded as waste and therefore the National Environmental Management: Waste Act is not triggered at all and the applicant should only apply for Environmental

Authorisation as per the Amended Environmental Impact Assessment Regulations in terms of Chapter 5 of the National Environmental Management Act, 1998 (Act 107 of 1998) (NEMA), Government Notice 278 in Government Gazette 32000 which published National Environmental Management: Waste Act (No 59 of 2008) defined waste as follows:

- "waste"** means any substance, whether or not that substance can be reduced, re-used, recycled and recovered-
- (a) that is surplus, unwanted, rejected, discarded, abandoned or disposed of;
 - (b) which the generator has no further use of for the purposes of production;
 - (c) that must be treated or disposed of; or
 - (d) that is identified as a waste by the Minister by notice in the Gazette, and includes waste generated by the mining, medical or other sector, but –
 - (i) a by-product is not considered waste; and
 - (ii) any portion of waste, once re-used, recycled and recovered, ceases to be waste.

Government Notice 718 in Government Gazette 32368 which published the List of Waste Management Activities under Section 19(1) of the National Environmental Management: Waste Act (No 59 of 2008) defined animal manure as follows:

"animal manure" means a by-product animal excreta which is bio-degradable in nature and could further be used for fertilization purposes.

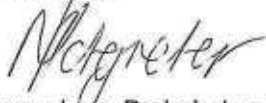
Animal manure is defined as a by-product and waste is explicitly defined as not being a by-product and therefore the Waste License application is considered to no longer be required for this proposed project. As we have commenced with the application process and compiled the Waste Management Plan (WMP) and the Waste Hierarchy Implementation Plan (WHIP), we would like for you to acknowledge and approve these two reports as the applicant will use it during the operational phase.

Kindly advise us on the way forward in regards to submitting the Waste Management Plan and the Waste Hierarchy Implementation Plan for

approval. Please acknowledge this letter and confirm that a Waste License Application is not required for the proposed project. We plan to submit the Final Basic Assessment Report for Environmental Authorisation in two weeks time.

We trust you find the above in order. Please do not hesitate to contact our office should you have any questions in this regard.

Sincerely,

A handwritten signature in black ink, appearing to read 'Mary-Lee Potgieter', written in a cursive style.

Mary-Lee Potgieter

**Bokamoso Landscape Architects &
Environmental Consultants CC**

Loura

From: Loura <user9@bokamoso.net>
Sent: Tuesday, February 18, 2014 1:17 PM
To: Boniswa.Belot@gauteng.gov.za; 'Faith.Mlambo@gauteng.gov.za'
Cc: 'user1@bokamoso.net'
Subject: MLEKI'S BEEF:
Attachments: SKMBT_C36014021812320.pdf

RE: THE SUBMISSION OF THE FINAL BASIC ASSESSMENT REPORT: PROPOSED CATTLE FEEDLOT ON PART OF PORTION 47 OF THE FARM BRANDBACH 471 JR, CULLINAN: GAUT 002/12-13/EO222:

Good day,

Attached to this e-mail please find the formal letter of request for an extension of one month's time for the above mentioned Project. Bokamoso Environmental will also hand deliver the same formal letter of request in due time.

Trust you find the above in order. Please confirm receipt of this e-mail. It would be much appreciated if you can provide us with a letter of approval for the extension of time on this above mentioned project, as requested.

Kind regards,

Loura du Toit (On behalf of Ms Ane Agenbacht Project Manager)



**Landscape Architects &
Environmental Consultants**

T: (+27)12 346 3810 | F: (+27) 86 570 5659 | E: lizelle@web.co.za | www.bokamoso.biz
36 Lebombo Street, Ashlea Gardens, Pretoria | P.O. Box 11375 Maroelana 0161

TRANSMISSION REPORT

(TUE) FEB 18 2014 12:35

User /Account :
DESTINATION : open
DEST. NUMBER : 0866267603
F-CODE :
SELF-TEL # : 0124607070
PAGES : 2page
RESULT : OK

DOCUMENT# : 7819634-831
TIME STORED : FEB 18 12:31
TX START : FEB 18 12:31
DURATION : 3min, 20sec
COH. MODE : G3

LEBOMBO GARDEN BUILDING
36 LEBOMBO ROAD
ASHLEA GARDENS
0081
P.O. BOX 1137 5
MARCELANA
0161
Tel: (012) 346 3810
Fax: 086 579 5559
E-mail: lizele@mmweb.co.za
Website: www.bokamoso.net



Fax Sheet. Fax Sheet. Fax Sheet. Fax Sheet.

**TO: GAUTENG DEPARTMENT OF AGRICULTURE AND RURAL
DEVELOPMENT**

DIAMOND CORNER BUILDING

LEBOMBO GARDEN BUILDING
36 LEBOMBO ROAD
ASHLEA GARDENS
0081

P.O. BOX 11375
MAROELANA
0161

Tel: (012) 346 3810
Fax: 086 570 5659
E-mail: lizelleg@mweb.co.za
Website: www.bokamoso.net



Fax Sheet. Fax Sheet. Fax Sheet. Fax Sheet.

**TO: GAUTENG DEPARTMENT OF AGRICULTURE AND RURAL
DEVELOPMENT
DIAMOND CORNER BUILDING
11 DIAGONAL STREET,
JOHANNESBURG.**

FAX NR: 086626760/ 011 355 1000

ATTENTION: MRS BONISWA BELOT AND MS FAITH MLAMBO.

DATE: 18th February 2014.

**RE: REQUEST FOR A LETTER OF ACKNOWLEDGEMENT
FOR THE EXTENSION OF TIME OF ONE MONTH FOR THE
SUBMISSION OF THE FINAL BASIC ASSESSMENT REPORT OF
THE PROPOSED CATTLE FEEDLOT ON PART OF PORTION 47
OF THE FARM BRANDBACH 471 JR, CULLINAN: GAUT: 002/13-
14/EO222.**

LEBOMBO GARDEN BUILDING
38 LEBOMBO ROAD
ASHLEA GARDENS
0081

P.O. BOX 11375
MAROELANA
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Tel: (012) 346 3810
Fax: 086 570 5659
E-mail: lizelleg@mweb.co.za
Website: www.bokamoso.net



GAUT: 002/12-13/E0222

Gauteng Department of Agriculture and Rural Development
Diamond Corner Building,
11 Diagonal Street,
JOHANNESBURG.

Attention: Mrs Boniswa Belot.

Email: Boniswa.belot@gauteng.gov.za; Faith.Mlambo@gauteng.gov.za.

18th February 2014.

**RE: THE SUBMISSION OF THE FINAL BASIC ASSESSMENT REPORT:
PROPOSED CATTLE FEEDLOT ON PART OF PORTION 47 OF THE FARM
BRANDBACH 471 JR, CULLINAN:GAUT 002/12-13/E0222.**

Good day Boniswa and Faith,

We would like to request an extension of a further month's time for the submission of THE FINAL BASIC ASSESSMENT REPORT for the above mentioned Project.

It would be handed in then by Tuesday, the 18th of March 2014.

It would be appreciated if you can provide us with a formal letter of response regarding the extension of time and whether it had been granted.

Please also confirm receipt of this letter.

Kind regards,

Laura du Toit (On behalf of Ms Ane Agenbacht Project Manager)

Basic Assessment



Gauteng Department of Agriculture and Rural Development (GDARD)

Basic Assessment Report in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended, and the Environmental Impact Assessment Regulations, 2010

List of all organs of state and State Departments where the draft report has been submitted, their full contact details and contact person

Kindly note that:

1. This **Basic Assessment Report** is the standard report required by GDARD in terms of the EIA Regulations, 2010 and must be submitted together with the application form.
 2. This application form is current as of 2 August 2010. It is the responsibility of the EAP to ascertain whether subsequent versions of the form have been published or produced by the competent authority.
 3. **A draft Basic Assessment Report must be submitted to all State Departments administering a law relating to a matter likely to be affected by the activity to be undertaken; the submission of such a draft report to such State Departments must be done on the day of submission of the draft report to the competent authority, this Department. (Attach a signed proof of such submission). signed**
 4. The report must be typed within the spaces provided in the form. The size of the spaces provided is not necessarily indicative of the amount of information to be provided. The report is in the form of a table that can extend itself as each space is filled with typing.
 5. Selected boxes must be indicated by a cross and, when the form is completed electronically, must also be highlighted.
 6. An incomplete report may be returned to the applicant for revision.
 7. The use of "not applicable" in the report must be done with circumspection because if it is used in respect of material information that is required by the competent authority for assessing the application, it may result in the rejection of the application as provided for in the regulations.
 8. Five (5) copies (3 hard copies and 2 CDs-PDF) of the final report and attachments must be handed in at offices of the relevant competent authority, as detailed below.
 9. No faxed or e-mailed reports will be accepted. Only hand delivered or posted applications will be accepted.
 10. Unless protected by law, and clearly indicated as such, all information filled in on this application will become public information on receipt by the competent authority. The applicant/EAP must provide any interested and affected party with the information contained in this application on request, during any stage of the application process.
-

DEPARTMENTAL DETAILS

Gauteng Department of Agriculture and Rural Development
Attention: Administrative Unit of the Sustainable Utilisation of the Environment (SUE) Branch
P.O. Box 8769
Johannesburg
2000

Administrative Unit of the Sustainable Utilisation of the Environment (SUE) Branch
Admin Unit 2nd Floor
68 Diamond Corner Building
Cnr Eloff and Market Street
Johannesburg

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

BASIC ASSESSMENT REPORT [REGULATION 22(1)]

(For official use only)

File Reference Number:						
Application Number:						
Date Received:						

(i) Submission to State Department (Section 3 above)

(A) Has a draft report for this application been submitted to all State Department administering a law relating to a matter likely to be affected as a result of the activity? **YES**

(B) Is a list of State Departments referred to in section A above been attached to this report, **YES**

if no, state reasons for not attaching the list.

SECTION A: ACTIVITY INFORMATION

1. ACTIVITY DESCRIPTION

Project title (must be the same name as per application form):

Proposed Cattle Feedlot on Part of Portion 47 of the farm Brandbach 471 JR, Cullinan



BASIC ASSESSMENT REPORT [REGULATION 22(1)]

LAND USE TABLE						
USE ZONE	Erf Number	Number of Erven	Area (ha)	FAR/Coverage	No. of Units	Floor Area (m²)
Agriculture	47	1	19,9	N/A	N/A	N/A
	N/A	N/A	N/A	N/A	N/A	N/A
TOTAL	N/A	1	19,9	N/A	N/A	N/A

Select the appropriate box

The application is for an upgrade of an existing development

The application is for a new development

Other, specify

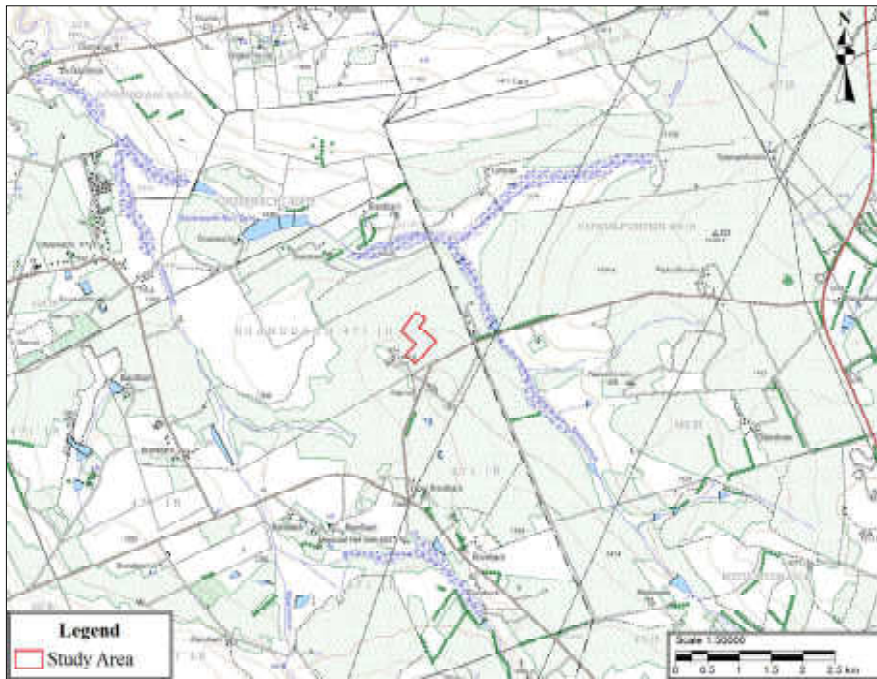


Figure 1: Locality Map

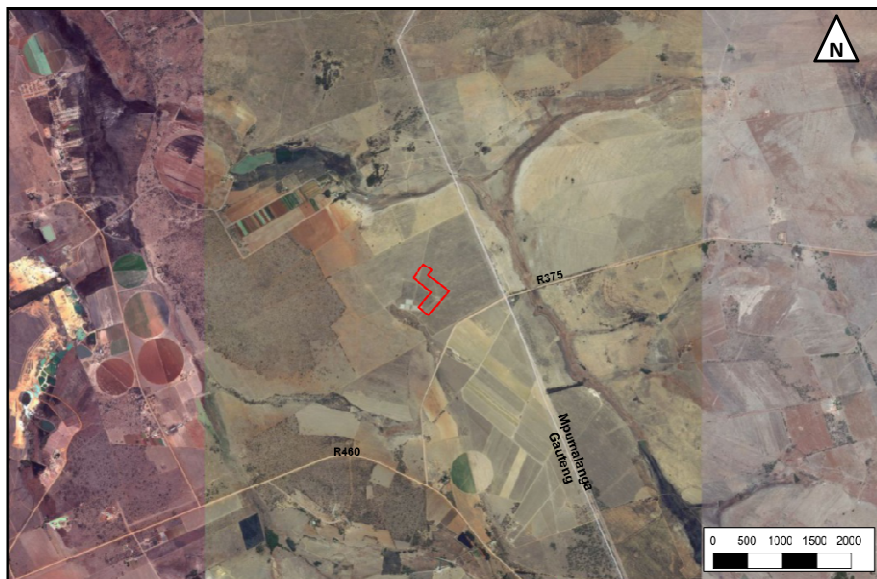


Figure 2: Aerial Map

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

The proposed feedlot can accommodate 4000 head of cattle when fully operational. The feedlot is proposed to be established on a farm of 533 ha, although all activities which relate to the feedlot and manure storage facility will only be conducted on a selected 19.9 ha of the property. The feedlot will be established as an open-air feedlot and as a result the animals will be exposed to weather and climate conditions, including rain, heat and cold (*Please refer to Figure 1- Locality Map and Figure 2- Aerial Map*).

Animal waste material, with specific reference to manure will be generated through the process of animal secretion, and is regarded as a waste by-product of the animals and feedlot operations. The said manure will in turn as a result of the physical movement of cattle and precipitation contaminate the feedlot surface soil, and as such create a mixture of biodegraded manure and soil, which has an economic value in the sense that it is a source of plant nutrients and enhancer for the physical properties of soil.

In order to harness the economic value of manure, to enhance the health of cattle and to reduce the generation of dust, the manure-soil mixture will be removed from the feedlot pens, and thus has necessitated the establishment of a temporary manure storage facility. Manure generated on site will thus be managed through the application of a simple management actions set out as the following:

- 1) Manure generated as a result of animal secretions;
- 2) Manure decomposed or partially decomposed laying on the feedlot interface layer;
- 3) A mixture of biodegraded manure and soil removed mechanically (with the use of a tractor, grader and front end loader);
- 4) The mixture of biodegradable manure and soil is transported via tractor/truck to the temporary storage and composting facility;
- 5) The manure is temporarily stored in a designated storage facility and/or composting facility;
- 6) The manure is either directly sold from the storage facility to respective buyers (directly loaded as dry bulk material into trucks for transportation) or sold as compost, once processed at the composting facility;

7) Manure which is not sold directly from the storage facility to respective buyers or sold as compost, once processed at the composting facility will be disposed of mechanically to agricultural land, to enhance the physical and biological properties of soil for crop production.

Infrastructure that will be associated with the cattle feedlot is:

- Worker's housing;
- Office;
- Storage areas;
- Hospital;
- Feedlot; and
- Processing unit with a loading bank.

Activities Applied for:

ACTIVITIES FOR ENVIRONMENTAL AUTHORISATION

Indicate the number and date of the relevant Government Notice:	Activity No (s) (in terms of the relevant notice) :	Describe each listed activity:
R. 544, 18 June 2010	Listing Notice 1	<p>Activity 4</p> <p>The construction of facilities or infrastructure for the concentration of animals for the purpose of commercial production in densities that exceed-</p> <ul style="list-style-type: none"> • 20 square metres per large stock unit and more than 500 units per facility; • 8 square metres per small stock unit and; <p>a. more than 1000 units per facility excluding pigs where (b) will apply;</p> <p>b. more than 250 pigs per facility excluding piglets that are not yet</p>

		weaned.
<p>Reason for inclusion: <i>The proposed feedlot facility will have more than 500 units of cattle for the purpose of commercial production and therefore this activity remains applicable.</i></p>		
<p>R. 544, 18 June 2010</p>	<p>Listing Notice 1</p>	<p>Activity 9 The construction of facilities or infrastructure exceeding 1000m in length for the bulk transportation of water, sewage or stormwater –</p> <ul style="list-style-type: none"> (i) with an internal diameter of 0,36m or more; or (ii) with a peak throughput of 120 l 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 stormwater drainage inside a road reserve; or (b) where such construction will occur within urban areas but further than 32m from a watercourse, measured from the edge of the watercourse.
<p>Reason for inclusion: <i>It was decided to keep this activity as part of the activities applied for, because some amendments to the storm water management or to pipelines could be required by DWA and such amendments could trigger additional activities.</i></p>		
<p>R. 544, 18 June 2010</p>	<p>Listing Notice 1</p>	<p>Activity 22 The construction of a road outside urban areas,</p> <ul style="list-style-type: none"> (i) with a reserve wider than 13,5 meters or, (ii) where no reserve exists where the road is wider than 8 metres, or (iii) for which an environmental

		<p>authorisation was obtained for the route determination in terms of activity 5 in Government Notice 387 of 2006 or activity 18 in Notice 545 of 2010.</p>
<p>Reason for inclusion: <i>The proposed development will require an access road to the cattle feedlot from the main farm entrance. However, there is an existing access road for Alternative 1 but not for Alternative 2 and therefore this activity should be retained.</i></p>		
<p>R. 544, 18 June 2010</p>	<p>Listing Notice 1</p>	<p>Activity 23 The transformation of undeveloped, vacant or derelict land to –</p> <ul style="list-style-type: none"> (i) residential, retail, commercial, recreational, industrial or institutional use, inside an urban area. And where the total area to be transformed is 5 hectares or more, but less than 20 hectares, or (ii) residential, retail, commercial, recreational, industrial or institutional use, outside an urban area and where the total area to be transformed is bigger than 1 hectare but less than 20 hectares; - <p>except where such transformation takes place for linear activities.</p>
<p>Reason for inclusion: <i>The study area is currently zoned as agricultural where some farming activities are present. The area to be transformed to a commercial agricultural facility will exceed the 1 hectare as stipulated in 23(ii).</i></p>		

ACTIVITIES FOR A WASTE LICENSE [as originally applied for, prior to the amendment to the National Environmental Management Waste Act 2008 (Act no 59, 2008) as on 29 November 2013]

Indicate the No. & Date of the Relevant Notice:	Category A or B (as listed in National Environmental Management: Waste Act)	Activity Numbers (As Listed in either Category A or B of National Environmental Management: Waste Act)
GN 718 of 3 July 2009	Category A	Activity 1 The storage, including the temporary storage of general waste at a facility that has the capacity to store in excess of 100m³ of general waste at any one time, excluding the storage of waste in lagoons.
GN 718 of 3 July 2009	Category A	Activity 5 The sorting, shredding, grinding or bailing of general waste at a facility that has the capacity to process in excess of one ton of general waste per day.
GN 718 of 3 July 2009	Category A	Activity 7 The recycling or re-use of general waste of more than 10 tons per month.
GN 718 of 3 July 2009	Category A	Activity 17 The storage, treatment or processing of animal manure at a facility with a capacity to process in excess of one ton per day.
GN 718 of 3 July 2009	Category A	Activity 18 The construction of facilities for activities listed in Category A of this

		Schedule.
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However, it should be noted that on 29 November 2013, the listed activities of the National Environmental Management Waste Act 2008 (Act no 59, 2008) changed as per Government Notice 921 in Government Gazette 37083. Due to this notice some of the activities are no longer triggered. In addition, it is now understood that animal manure is not regarded as waste and therefore the National Environmental Management: Waste Act is not triggered at all and the applicant should only apply for Environmental Authorisation as per the Amended Environmental Impact Assessment Regulations in terms of Chapter 5 of the National Environmental Management Act, 1998 (Act 107 of 1998) (NEMA). Government Notice 278 in Government Gazette 32000 which published National Environmental Management: Waste Act (No 59 of 2008) defined waste as follows:

“waste” means any substance, whether or not that substance can be reduced, re-used, recycled and recovered-

- (a) that is surplus, unwanted, rejected, discarded, abandoned or disposed of;
- (b) which the generator has no further use of for the purposes of production;
- (c) that must be treated or disposed of; or
- (d) that is identified as a waste by the Minister by notice in the Gazette, and includes waste generated by the mining, medical or other sector, but –
 - (i) a by-product is not considered waste; and
 - (ii) any portion of waste, once re-used, recycled and recovered, ceases to be waste.

Government Notice 718 in Government Gazette 32368 which published the List of Waste Management Activities under Section 19(1) of the National Environmental Management: Waste Act (No 59 of 2008) defined animal manure as follows:

“animal manure” means a by-product animal excreta which is bio-degradable in nature and could further be used for fertilization purposes.

Animal manure is defined as a by-product and waste is explicitly defined as not being a by-product and therefore the Waste License application is considered to no longer be required for this proposed project.

As the application process was previously already underway, the Waste Management Plan (WMP) and the Waste Hierarchy Implementation Plan (WHIP) was already compiled and it is added as an annexure to this report as it will still be followed in the operational phase of this proposed development.

2. APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES

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

Title of legislation, policy or guideline:	Administrating Authority:	Promulgation Date:
National Environmental Management Act No. 107 of 1998	National & Provincial	27 November 1998

The NEMA is primarily an enabling Act in that it provides for the development of environmental implementation plans and environmental management plans. The principles listed in the act serve as a general framework within which environmental management and implementation plans must be formulated.

The Minister of Environmental Affairs and Tourism passed (in April 2006) Environmental Impact Assessment Regulations¹ (the Regulations) in terms of Chapter 5 of the National Environmental management Act, 1998² (NEMA). The new Regulations came into effect on 3 July 2006.

Notice No. R 386 and R 387 of the New Regulations list activities which require that the EIA Process be followed. The Activities listed in Notice No. R 386 requires that a Basic Assessment Process be followed and the Activities listed in Notice No. R 387 requires that the Scoping and EIA process be followed.

Implications for the Development:

The application for the proposed Cattle Feedlot consist only of activities listed under Notice No. R 386, therefore a Basic Assessment Report will be submitted for the authorization from the Local Authority.

Environmental Impact Assessment Regulations in terms of Chapter 5 of the National Environmental Management Act, 1998 (Act No 107 of 1998)	National	2010
<p>The Minister of Environmental Affairs passed (in June 2010) the Amended Environmental Impact Assessment Regulations in terms of Chapter 5 of the National Environmental Management Act, 1998 (Act 107 of 1998) (NEMA). The Amended Regulations came into effect on 2 August 2010, and therefore all new applications must be made in terms of the Amended NEMA regulations and not in terms of the 2006 NEMA Regulations or the New Regulations of the ECA. The purpose of this process is to determine the possible negative and positive impacts of the proposed development on the surrounding environment and to provide measures for the mitigation of negative impacts and to maximize positive impacts.</p> <p>Notice No. R 544, R 545 and R 546 of the Amended Regulations list the activities that indicate the process to be followed. The activities listed in Notice No. R 544 requires that a Basic Assessment process be followed and the Activities listed in terms of Notice No. R 545 requires that the Scoping and EIA process be followed. Notice No. 546 has been introduced to make provision for Activities in certain geographical and sensitive areas.</p> <p>Subsequently, Listing (R. 546) requires that a Basic Assessment Process be followed. It should however be noted that the Draft Guideline Document of DEA [Department of Environmental Affairs, (Previously known as the Department of Environmental Affairs and Tourism)] states that if an activity being applied for is made up of more than one listed activity, and the Scoping and EIA process is required for one or more of these activities, the Scoping and EIA process must be followed for the whole application.</p> <p>Implications for the Development: Significant – The application for the proposed development consist of activities listed under Notice R. 544 (Listing No. 1) and therefore a Basic Assessment Report will be submitted to GDARD for consideration.</p>		

National Water Act, 1998 (Act No. 36 of 1998)	National & Provincial	20 August 1998
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The purpose of this Act is to ensure that the nation's water resources are protected, used, developed, conserved, managed and controlled in ways that take into account, amongst other factors, the following:

- Meeting the basic human needs of present and future generations
- Promoting equitable access to water;
- Promoting the efficient, sustainable and beneficial use of water in the public interest;
- Reducing and preventing pollution and degradation of water resources;
- Facilitating social and economic development; and
- Providing for the growing demand for water use.

In terms of the section 21 of the National Water Act, the developer must obtain water use licences 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 water course;
- d) Engaging in a stream flow reduction activity contemplated in section 36;
Engaging in a controlled activity identified as such in section 37(1) or declared under section 38(1);
- e) Discharging waste or water containing waste into a water resource through a pipeline, canal, sewer, sea outfall or other conduit;
- f) Disposing of waste in a manner which may detrimentally impact on a water resource;
- g) Disposing in any manner which contains waste from or which has been heated in any industrial or power generation process;
- h) Altering the bed, banks, course or disposing of water found underground if it is necessary for the safety of people;
- i) 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
- j) Using water for recreational purposes.

The National Water Act also requires 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 submitted for approval.



Figure 3 – Hydrology Map

Implications for the Development:

The proposed development is not subjected to flood lines of any natural stream or water course within an expected frequency of 1:50 and 1:100 years and therefore in terms of Section 21 of the National Water Act no water use licenses, for activity (c) and (i), are required for the development itself. However, the larger study area does contain a natural stream running through the property at the southern corner and some operational activities may require authorisation in terms of Section 21 of the National Water Act. The developer will need water use licenses for the proposed development. **(Refer to Figure 3 – Hydrology Map)**

National Environmental Management: Air Quality Act, 2004 (Act 39 of 2004)	National & Provincial	2004
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The NEMA: AQA serves to repeal the Atmospheric Pollution Prevention Act (45 of 1965) and various other laws dealing with air pollution and it provides a more comprehensive framework within which the critical question of air quality can be addressed.

The purpose of the Act is to set norms and standards that relate to:

- ❑ Institutional frameworks, roles and responsibilities
- ❑ Air quality management planning
- ❑ Air quality monitoring and information management
- ❑ Air quality management measures
- ❑ General compliance and enforcement.

Amongst other things, it is intended that the setting of norms and standards will achieve the following:

- The protection, restoration and enhancement of air quality in South Africa
- Increased public participation in the protection of air quality and improved public access to relevant and meaningful information about air quality.
- The reduction of risks to human health and the prevention of the degradation of air quality.

The Act describes various regulatory tools that should be developed to ensure the implementation and enforcement of air quality management plans. These include:

- Priority Areas, which are air pollution 'hot spots'.
- Listed Activities, which are 'problem' processes that require an Atmospheric Emission Licence.
- Controlled Emitters, which includes the setting of emission standards for 'classes' of emitters, such as motor vehicles, incinerators, etc.
- Control of Noise.
- Control of Odours.

Implications for the Development:

During the construction phase, dust and the generation of noise can become a significant factor, especially to the surrounding landowners. However if the development is well planned and the mitigating measures are successfully implemented the proposed development's contribution to air pollution and the generation of air pollution can become less significant. During the operational phase of the feedlot methane and CO₂ will be emitted into the atmosphere, however, this is not controlled by legislation in South Africa.

National Heritage Resources Act, 1999 (Act No. 45 of 1965 (NHRA)	National & Provincial	April 1965
<p>The National Heritage Resources Act legislates the necessity and heritage impact assessment in areas earmarked for development, which exceed 0.5ha. The Act makes provision for the potential destruction to existing sites, pending the archaeologist's recommendations through permitting procedures. Permits are administered by the South African Heritage Resources Agency (SAHRA).</p> <p>Implications for the Development: Although no features of Heritage importance were identified during the Assessment, if any such features are discovered during construction activities and clearing of the application site, the correct "procedures for an Environmental incident" (at the end of EMP, Appendix H) must be followed.</p>		
National Environmental Management Protected Areas Act, 2003 (Act No. 57 of 2003)	National	2003
<p>The purpose of this Act is to provide for the protection, conservation and management of ecologically viable areas representative of South Africa's biological biodiversity and its natural landscapes.</p> <p>Implications for the Development: This Act will not have to be considered for the application as the study area does not fall in any protected areas.</p>		

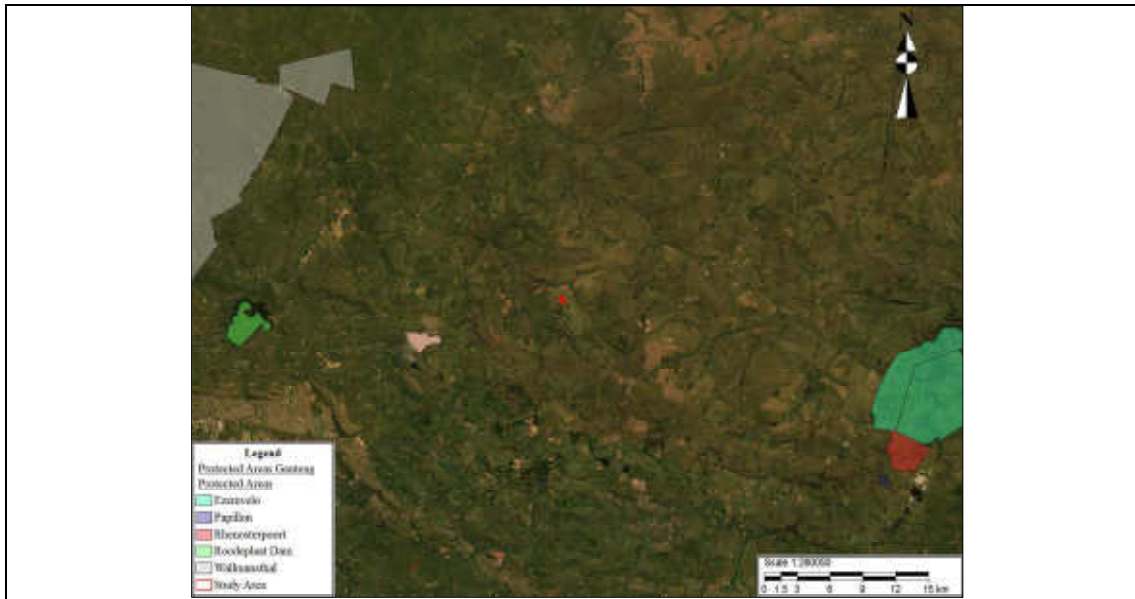


Figure 4 – Protected areas

National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004)	National	2004
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The Biodiversity Act, provides for the management and protection of the country's biodiversity within the framework established by NEMA. It provides for the protection of species and ecosystems in need of protection, sustainable use of indigenous biological resources, equity and bioprospecting, and the establishment of a regulatory body on biodiversity- **South African Biodiversity Institute.**

Objectives of the Act:

(a) With the framework of the National Environmental Management Act, to provide for:

- (i) The management and conservation of biological diversity within the Republic and of the components of such biological diversity;
- (ii) The use of indigenous biological resources in a sustainable manner; and
- (iii) The fair and equitable sharing among stakeholders of benefits arising from bio-prospecting involving indigenous biological resources;

(b) To give effect to ratified international agreements relating to

biodiversity which are binding on the republic;

(c) To provide for co-operative governance in biodiversity management and conservation; and

(d) To provide for a South African National Biodiversity Institute to assist in achieving the objectives of this Act.

Implications for the Development:

According to the GDARD C-Plan the study area does not fall within an irreplaceable site. No red data plant species were found on site during the flora assessment as well as no red data fauna species during the Ecological Fauna Habitat survey. No wetland were found on site.



Figure 5 – Irreplaceable sites

GDARD Draft Ridges Policy	Provincial	2007
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The main purpose of the draft Red Data Policy is to protect red data plant species in Gauteng Province. This policy requires that red data species remain in situ and it gives priority ratings (based on where they occur) to the different Red Data species. If Red Data species are discovered on the study area this policy will have relevance and it should be described in detail as to how it is applicable to this project in the BA report.

Implications for the Development:

The policy will not have to be considered for the application as the study area does not fall on a ridge or in a buffer zone of any ridge.



Figure 6 – Ridges

Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983)	National	1 June 1983
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This act provides for control over the utilization of natural agricultural resources of South Africa in order to promote the conservation of soil, water sources and the vegetation as well as the combating of weeds and invader plants; and for matters connecting therewith.

Implications for the Development:

Not Significant – According to the Gauteng Agricultural Potential Atlas (GAPA 3), the proposed Cattle Feedlot Development is located on a moderate to high potential for Agricultural Land. This is not seen as significant as the proposed development is for agricultural purposes.



Figure 7 – Agricultural Potential

GDARD Agricultural Hub Policy	Provincial	2006
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GDARD indentified 7 Agricultural Hubs in Gauteng province. These hubs are earmarked for agricultural activities and there are policies and guidelines that should be taken into consideration when one plans to develop in these hubs areas. Urban development is usually not supported in these hubs.

Implications for the Development:

The study area is situated within the Nokeng Agricultural Hub, which is one of the seven agricultural hubs identified for Gauteng.



Figure 8 – Agricultural Hubs

Gauteng Urban Edge 2008 / 2009	Provincial	2009
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According to Mr. Neels du Toit of the Gauteng Department of Economic Development the urban edge is now delineated on a yearly basis and it is the responsibility of the local authorities to request for a yearly amendment to the urban edge.

From this year onwards the urban edge will be reviewed at the end of September and it will be adjusted to be in accordance with the proposals supplied by the various local authorities.

Implication for the Development:

The study area is excluded from the urban edge as indicated on the spatial development framework, the 2007 provincial urban edge and into the revised 2008 / 2009 urban edge. This is not significant as the

proposed development is not of urban nature but it is an agricultural development.



Figure 9 – Urban Edge

National Environmental Management: Waste Act (Act 59 of 2009)

National

11 June 2010

This Act came into affect on 11 June 2009. It aims to consolidate waste management in South Africa, and contains a number of commendable provisions, including: affect

- The establishment of a national waste management strategy, and national and provincial norms and standards, for amongst other, the classification of waste, waste service delivery, and tariffs for such waste services;
- Addressing reduction, reuse, recycling and recovery of waste;
- The requirements for industry and local government to prepare integrated waste management plans;
- The establishment of control over contaminated land;
- Identifying waste management activities that requires a license, which currently include facilities for the storage, transfer, recycling, recovery, treatment and disposal of waste on land;
- Co-operative governance in issuing licenses for waste management facilities, by means of which a licensing authority can issue an integrated or consolidated license jointly with other organs of state that has legislative control over the activity; and
- The establishment of a national waste information system.

Implications for the Development:

A waste management license will not be required during the operational phases of the proposed Cattle feedlot as animal waste material (manure) will be generated as a by-product and by-products are not considered to be waste.

Red List Plant Species Guidelines	Provincial	26 June 2006
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The purpose of these guidelines is to promote the conservation of Red List Plant Species in Gauteng, which are species of flora that face risk of extinction in the wild. By protecting Red List Plant Species, conservation of diverse landscapes is promoted which forms part of the overall environmental preservation of diverse ecosystems, habitats, communities, populations, species and genes in Gauteng.

These Guidelines are intended to provide a decision-making support tool to any person or organization that is responsible for managing, or whose actions affect, areas in Gauteng where populations of Red List Plant Species grow, whether such person or organization be an organ of state or private entity or individual; thereby enabling the conservation of the Red List Plant Species that occur in Gauteng.

Implications for the Development:

Eight Red data plant species are known to occur in the 2528DA quarter degree grid cell. According to the GDARD C-Plan only one Orange Listed plant possibly occur in the surrounding areas, more than 600m away from the site.



Figure 10 – Orange Data Plants

Gauteng Noise Control Regulations, 1999	Provincial	1999
<p>The regulation controls noise pollution. According to the acceptable noise levels in a residential area situated within an urban area is 55dBA and the maximum acceptable noise levels in a rural area is 45dBA.</p> <p>Implications for the Development: Within the construction phase of the proposed cattle feedlot, the impact of noise could be problematic, but such impacts are generally short term. No noise impacts are expected for the operational activities of this proposed cattle feedlot. One should note that practical mitigation measures for noise pollution are low, but certain measures can be implemented to mitigate the severity. (Please Refer to Appendix H (EMP) for a list of suitable guidelines and mitigation measures)</p>		
The Gauteng Transport Infrastructure Act, 2001	Provincial	2001
<p>The Act was created to consolidate the laws relating to roads and other types of transport infrastructure in Gauteng; and to provide for the planning, design, development, construction, financing, management, control, maintenance, protection and rehabilitation of provincial roads, railway lines and other transport infrastructure in Gauteng; and to provide for matter connected therewith.</p> <p>Implications for the Development: All developments in Gauteng must take the Gauteng Road network as published into consideration and no development may be planned across any provincial or K-route. No new roads or access roads will be required for the proposed development of the cattle feedlot.</p>		

3. ALTERNATIVES

Describe the proposal and alternatives that are considered in this application. Alternatives should include a consideration of all possible means by which the purpose and need of the proposed activity could be accomplished. The determination of whether the site or activity (including different processes etc.) or both is appropriate needs to be informed by the specific circumstances of the activity and its environment. The no-go option must in all cases be included in the assessment phase as the baseline against which the impacts of the other alternatives are assessed. **Do not** include the no go option into the alternative table below.

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

Provide a description of the alternatives considered

No.	Alternative type, either alternative: site on property, properties, activity, design, technology, operational or other(provide details of "other")	Description
1	Proposal	Agricultural
2	Alternative 2 (Site Alternative)	Agricultural

NOTE: The numbering in the above table must be consistently applied throughout the application report and process

Alternative 1 (Proposal)

The proposed development is for an Agricultural development of a cattle feedlot covering an area of 19.9 hectares on a farm of more than 500 hectares. The proposed cattle feedlot will consist of the following facilities/infrastructure:

- Worker's housing;
- Office;
- Storage areas;
- Hospital;
- Feedlot; and
- Processing unit with a loading bank.

The proposed cattle feedlot will be an agricultural development within an area zoned for Agriculture. The surrounding land use is mainly agriculture and therefore the proposed activity is in line with the land use zoning. The proposed area for the cattle feedlot is ideal for this purpose as it is a flat plain with a slight slope which is good for manure run-off management. This site will need the minimum construction of roads as it is close to the existing access to the farm. The site is also situated on old cultivated lands and no primary vegetation will need to be removed, no large trees occur on this site.

Alternative 2

The alternative for the proposed development is similar to the proposal where the layout and activities will be the same. The impacts will be of the same nature, however it will be higher for the alternative 2 due to

its location.

The Alternative 2 site for the cattle feedlot is towards the west of the larger farm area and further away from the site access, therefore a number of new roads will need to be planned in order to have access to this site. Access roads will need to be built around and irreplaceable site, according to the GDARD C-Plan, that is situated between the farm access and alternative site. This site is less disturbed with more woody vegetation and adjacent to an area with more natural vegetation. The Alternative 2 site also encroaches the Irreplaceable Site (as identified on the GDARD C-Plan).



4. PHYSICAL SIZE OF THE ACTIVITY

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

Alternative:

Alternative 1 (Proposed activity)

Alternative 2 (if any)

Alternative 3 (if any)

Size of the activity:

19.9 ha
19.9 ha

Ha

or, for linear activities:

Alternative:

Length of the activity: _____

BASIC ASSESSMENT REPORT [REGULATION 22(1)]

Alternative 1(Proposed activity)
 Alternative 2 (if any)
 Alternative 3 (if any)

m/km

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

Alternative:

Alternative 1(Proposed activity)

Alternative 2 (if any)

Alternative 3 (if any)

Size of the site/servitude:

± 533 ha
± 533 ha

Ha/m²

5. SITE ACCESS

Alternative 1 (Proposal)

Does ready access to the site exist, or is access directly from an existing road?

YES	NO
X	

If NO, what is the distance over which a new access road will be built

Describe the type of access road planned:

The proposed access road will make use of the existing entrance to the site as well as the access road. No new roads will be required for this Alternative.

Include the position of the access road on the site plan.

Alternative 2

Does ready access to the site exist, or is access directly from an existing road?

YES	NO
	X
Not yet determined as this is not the desired alternative	

If NO, what is the distance over which a new access road will be built

Describe the type of access road planned:

The proposed access road will make use of the existing entrance to the site as well as the access road. However, the access road will need to be lengthened around the ridge, to the alternative site. Alternative 2 will require additional construction and clearing of vegetation.

Include the position of the access road on the site plan.

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

Section A 6-8 has been duplicated

2

Number of times

(only complete when applicable)

6. SITE OR ROUTE PLAN

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

- the scale of the plan, which must be at least a scale of 1:2000 (scale can not be larger than 1:2000 i.e. scale can not be 1:2500 but could where applicable be 1:1500)
- the property boundaries and numbers of all the properties within 50m of the site;
- the current land use as well as the land use zoning of each of the properties adjoining the site or sites;
- the exact position of each element of the application as well as any other structures on the site;
- the position of services, including electricity supply cables (indicate above or underground), water supply pipelines, boreholes, street lights, sewage pipelines, septic tanks, storm water infrastructure and telecommunication infrastructure;
- walls and fencing including details of the height and construction material;
- servitudes indicating the purpose of the servitude;
- sensitive environmental elements on and within 100m of the site or sites including (but not limited thereto):
 - Rivers and wetlands;
 - the 1:100 and 1:50 year flood line;
 - ridges;
 - cultural and historical features;
 - areas with indigenous vegetation (even if it is degraded or infested with alien species);
- for gentle slopes the 1m contour intervals must be indicated on the plan and whenever the slope of the site exceeds 1:10, the 500mm contours must be indicated on the plan; and
- the positions from where photographs of the site were taken.
- Where a watercourse is located on the site at least one cross section of the water course must be included (to allow the 32m position from the bank to be clearly indicated)

7. SITE PHOTOGRAPHS

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

8. FACILITY ILLUSTRATION

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

SECTION B: DESCRIPTION OF RECEIVING ENVIRONMENT

Note: Complete Section B for the proposal

Further:

Instructions for completion of Section B for linear activities

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

Section B has been duplicated for sections of the route times

Instructions for completion of Section B for location/route alternatives

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

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

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

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

- All significantly different environments identified for Alternative 2 is to be completed and attached in a chronological order; then
- all significantly different environments identified for Alternative 3 is to be completed and attached chronological order
- etc

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

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

1. PROPERTY DESCRIPTION

Property description:

**Part of Portion 47 of the farm Brandbach 471 JR,
Cullinan**

(Farm name, portion etc.)

2. ACTIVITY POSITION

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

Alternative:

Latitude (S):

Longitude (E):

-25.620225°

28.647974°

In the case of linear activities:

Alternative:

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

Latitude (S):

Longitude (E):

	°		°
	°		°
	°		°

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

Addendum of route alternatives attached

3. GRADIENT OF THE SITE

Indicate the general gradient of the site.

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

4. LOCATION IN LANDSCAPE

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

Ridgeline	Plateau	Side slope of hill/ridge	Valley	Plain	Undulating plain/low hills	River front
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5. GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE

REFER TO APPENDIX I: FIGURE 11– SOILS MAP



Please note for clarity purposes all figures within the Basic Assessment for the proposed Cattle Feedlot is in a larger format at the back of the Report as Appendix I.

BASIC ASSESSMENT REPORT [REGULATION 22(1)]

Is the site located on any of the following?

Shallow water table (less than 1.5m deep)

Dolomite, sinkhole or doline areas

Seasonally wet soils (often close to water bodies)

Unstable rocky slopes or steep slopes with loose soil

Dispersive soils (soils that dissolve in water)

Soils with high clay content (clay fraction more than 40%)

Any other unstable soil or geological feature

An area sensitive to erosion

YES	NO (maybe)
YES	NO not on the proposed development area
YES	NO
YES	NO
YES	NO
YES	NO
YES	NO
YES (maybe) during the operational phase	NO

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

b) are any caves located on the site(s)

YES **NO**

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

Latitude (S): Longitude (E):

c) are any caves located within a 300m radius of the site(s)

YES **NO**

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

Latitude (S): Longitude (E):

d) are any sinkholes located within a 300m radius of the site(s)

YES **NO**

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

Latitude (S): Longitude (E):

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

The proposed development area is underlain by the Wilgeriver Formation of the Waterberg Group. To the west of the property, a diabase intrusion, most probably in the form of a sill is present. No linear structures or faults in close proximity to the proposed feedlot are shown.

Boreholes on the bigger farm area are used for various agricultural and domestic applications. Boreholes with significant yields exist within the project area (ranging from 3000 to 81 000 litres/hour with an average yield of 16 000 litres/hour). Due to the site's close proximity to the Malanspruit, a relatively shallow water table can be expected. This was confirmed by the water level measured in the boreholes identified during the hydrocensus (the majority of the boreholes having a static water level < 6 meters below ground level). It can be assumed that the

regional groundwater flow direction will emulate to local topography. Groundwater flow will thus be in a north and north-easterly direction towards the Malanspruit.

The water quality in all of the sampled boreholes can be classified as Class 1 and is fit for human consumption. Based on information collected during the hydrocensus it can be concluded that the aquifer system in the study area can be classified as a "Major Aquifer System". The local population and farms make use of groundwater as a source of potable water and borehole yields and water quality are generally good. One can also assume that the aquifer is important for supplying base flow to the local rivers and their tributaries. Consequently, high level groundwater protection may be required.

6. AGRICULTURE

REFER TO APPENDIX I: FIGURE 7 – AGRICULTURAL POTENTIAL MAP



Does the site have high potential agricultural soils as contemplated in the Gauteng Agricultural Potential Atlas (GAPA)? YES NO

Please note: The Department may request specialist input/studies depending on the nature of the soil type and location of the site

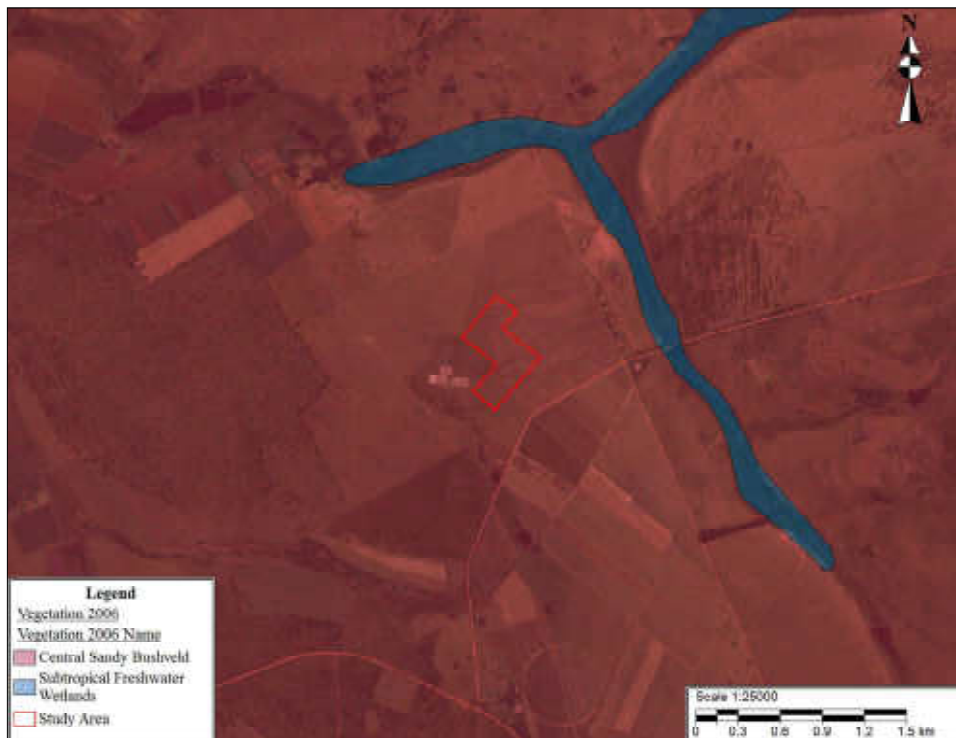
Implications for the development:

No Agricultural Potential Study was conducted for the proposed development due to the following:

- The proposed development site under application is still rural of nature, with no landowners/ tenants practicing agricultural activities;
- The proposed application will be for agricultural purposes;
- The Agricultural Potential of the proposed application site according to GAPA version 3 indicates a Moderate to High Agricultural Potential;
- The proposed development sites are located within one of the seven Agriculture Hubs Identified for the Gauteng Province, namely Nokeng Agricultural Hub (Please refer to figure 7 – Agricultural Hubs)

7. GROUNDCOVER

REFER TO APPENDIX I: FIGURE 12 – VEGETATION GROUNDCOVER MAP



To be noted that the location of all identified rare or endangered species or other elements should be accurately indicated on the site plan(s).
Indicate the types of groundcover present on the site and include the estimated percentage found on site

Natural veld - good condition % =	Natural veld with scattered aliens % = 15	Natural veld with heavy alien infestation % = 85	Veld dominated by alien species % =	Landscaped(vegetation) % =
Sport field % =	Cultivated land % =	Paved surface (hard landscaping) % =	Building or other structure % =	Bare soil % =

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

Are there any rare or endangered flora or fauna species (including red list species) present on the site

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

Refer to Appendix G1: Fauna and Flora Habitat Assessment

If YES, specify and explain: **Note: Although the answer is no, it was decided to supply some detail regarding the fauna and flora of the study area.**

The study area lies in the quarter degree grid cell 2528DA which has been classified as Central Sandy Bushveld, sandy plains with woodland habitat where the soil is deep and sandy and on certain areas shallow and gravelly. This grasslands falls within a warm-temperature summer-rainfall region with high summer temperatures and severe frequent winter frosts. This vegetation unit is considered vulnerable. Its conservation target is 19% with small parts of this unit conserved in statutory reserves and few private conservation areas. Almost a quarter of the unit is already transformed by cultivation and urbanization. The study site can be described as old cultivated lands which lead to the introduction of some alien and invasive plant species. Cattle grazing are present on the study area contributing to the presence of alien and invasive species as well as the presence of species known to occur in over-utilised areas. The entire study site is a homogeneous vegetation type with little to no variation in species composition across the site. The vegetation is characterised by grass and forb species, with almost no woody plants present.

No red listed plants were identified during the flora assessment. However, it should be taken into account that the survey was done during the end of autumn and very little of the plants were flowering, resulting in difficult identification.

According to the Fauna Ecologist, the site has been cultivated and consists of grassland with a conspicuous concentration of low ecological status grass species and exotic weeds. Owing to relatively low microhabitat diversity at the site a low faunal diversity is anticipated. No loss of particular habitat or connectivity in terms of fauna is foreseen for the present footprint and the proposed footprint at the site.

No *Anthropoides paradiseus*, the blue crane, was recorded on the site, though it cannot be excluded that this bird may be a visitor at and

near the site. However, there is no evidence that the site is particular suitable habitat or being used as particular habitat for this bird species and it is unlikely that the development, if approved, will be a distinct threat to this species. It is unlikely that there are any threatened animal species or any other animal species of particular conservation concern distinctly using the site as a habitat. It is therefore concluded that there would be no threat to any threatened species or any other species of particular conservation concern at the site for the proposed footprint.

No wetlands were found on the proposed development site. The occurrences of seepages were investigated by a Wetland specialist and the nearest wetland was found more than 900m away from the study area.

Are there any rare or endangered flora or fauna species (including red list species) present within a 200m (if within urban edge, May 2002) or within 600m (if outside the urban edge, May 2002) radius of the site	YES	NO X
---	------------	-----------------

If YES, specify and explain:

According to the GDARD C-Plan, one Orange listed plant occurs in the surrounding area but not on the study site. This species was not found on the study site.

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

If YES, specify and explain:

Name of the specialist:	Reinier Terblanche		
Qualification(s) of the specialist: Professional Registration	M.Sc, Cum Laude; Pr.Sci.Nat, Reg. No. 400244/05		
Postal address:	P.O. Box 20488 Noordbrug		
Postal code:	2522		
Telephone:	Not available	Cell:	082 614 6684
E-mail:	reinierf.terblanche@gmail.com	Fax:	Not available
Are any further specialist studies recommended by the specialist?	YES	NO X	
If YES, specify:			
If YES, is such a report(s) attached?	YES	NO	
If YES list the specialist reports attached below			
Signature of specialist:	Not available	Date:	July 2013

Name of the specialist:	Mary-Lee Potgieter		
Qualification(s) of the specialist: Professional Registration	M.Sc; Cand.Sci.Nat, Reg. No. 100046/12		
Postal address:	P.O. Box 11375 Maroelana		
Postal code:	0161		
Telephone:	012 346 3810	Cell:	

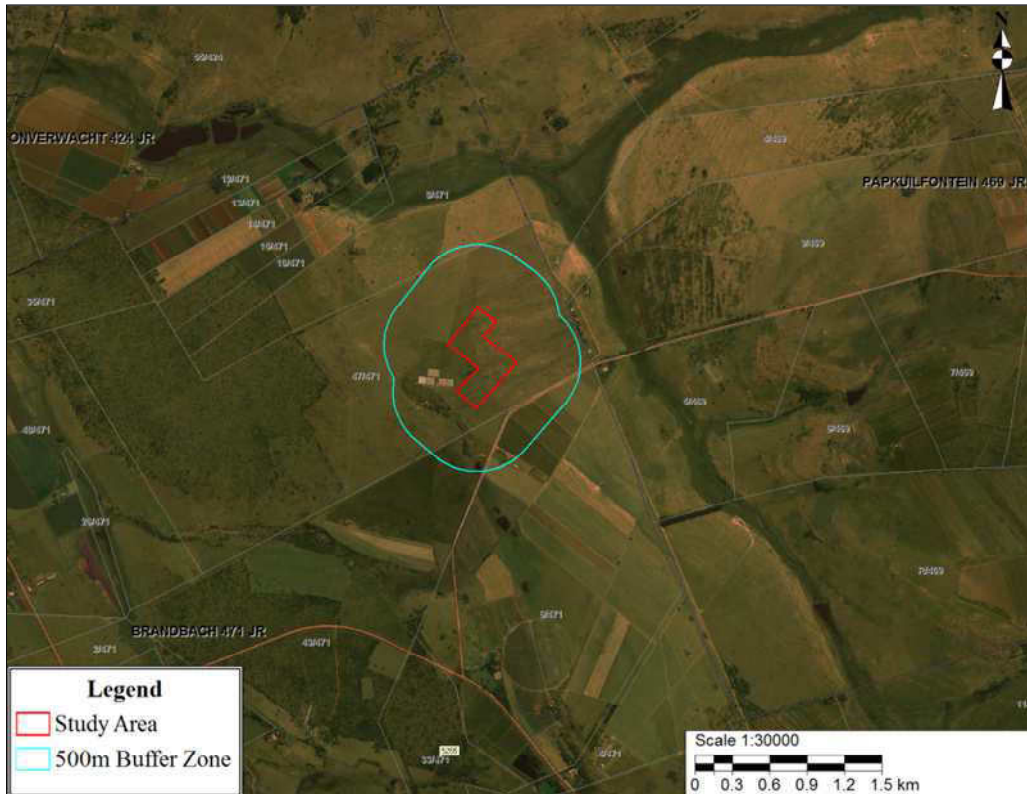
BASIC ASSESSMENT REPORT [REGULATION 22(1)]

E-mail:	lizelleg@mweb.co.za	Fax:	Not available
Are any further specialist studies recommended by the specialist?			YES NO X
If YES, specify:			
If YES, is such a report(s) attached?			YES NO
If YES list the specialist reports attached below			
Signature of specialist:	Not available	Date:	June 2013

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

8. LAND USE CHARACTER OF SURROUNDING AREA

REFER TO APPENDIX I: FIGURE13 SURROUNDING LAND-USES MAPS



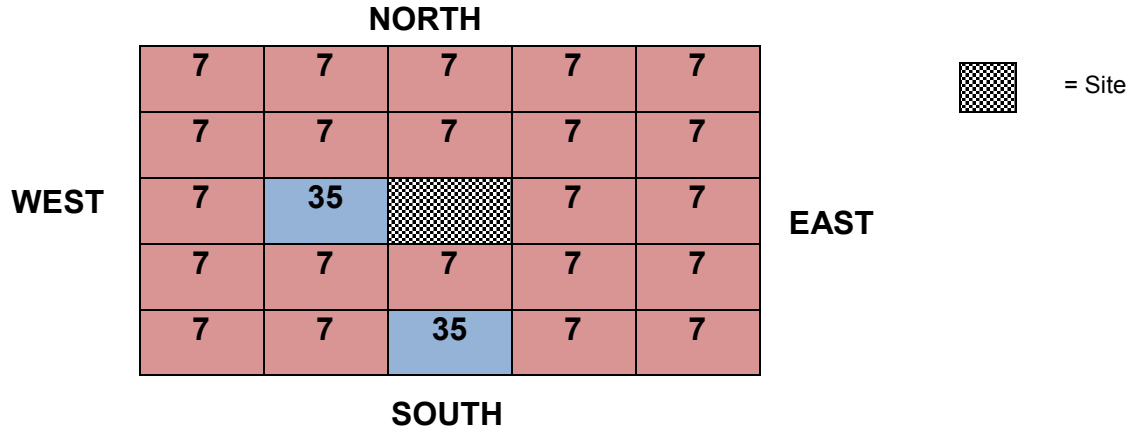
Using the associated number of the relevant current land use or prominent feature from the table below, fill in the position of these land-uses in the vacant blocks below which represent a 500m radius around the site

1. Vacant land	2. River, stream, wetland	3. Nature conservation area	4. Public open space	5. Koppie or ridge
6. Dam or reservoir	7. Agriculture	8. Low density residential	9. Medium to high density residential	10. Informal residential
11. Old age home	12. Retail	13. Offices	14. Commercial & warehousing	15. Light industrial
16. Heavy industrial	17. Hospitality facility	18. Church	19. Education facilities	20. Sport facilities
21. Golf course/polo fields	22. Airport	23. Train station or shunting yard	24. Railway line	25. Major road (4 lanes or more)N

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26. Sewage treatment plant	27. Landfill or waste treatment site	28. Historical building	29. Graveyard	30. Archeological site
31. Open cast mine	32. Underground mine	33. Spoil heap or slimes dam	34. Small Holdings	
Other land uses (describe):	35. Infrastructure associated with Agriculture			

NOTE: Each block represents an area of 250m X250m



Note:

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

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

Have specialist reports been attached

YES	NO
X	

If yes indicate the type of reports below

- Ecological Fauna Habitat Survey (Appendix G1)**
- Wetland Assessment (Appendix G2)**
- Vegetation Assessment Report (Appendix G3)**
- Geohydrological Investigation (G4)**

9. SOCIO-ECONOMIC CONTEXT

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

The agricultural sector in South Africa plays a valuable role in ensuring the sustainable supply of food to our growing population and represents one of the main sources of revenue. The feedlot is perfectly located in close proximity of an abattoir in a Gauteng Agricultural Hub. There is sufficient water supply for the feedlot. It is in line with the municipality's plan for agriculture. The feedlot has economical benefit for society in general. The feedlot supplies job opportunities to local communities and additional work for contractors in the area. It will

lead to the Increase in the supply of good quality meat.

10. CULTURAL/HISTORICAL FEATURES

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

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

- (a) the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;
- (b) the construction of a bridge or similar structure exceeding 50m in length;
- (c) any development or other activity which will change the character of a site-
 - (i) exceeding 5 000 m2 in extent; or
 - (ii) involving three or more existing erven or subdivisions thereof; or
 - (iii) involving three or more erven or divisions thereof which have been consolidated within the past five years; or
 - (iv) the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;
- (d) the re-zoning of a site exceeding 10 000 m2 in extent; or
- (e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority, must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.

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

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

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

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

Will any building or structure older than 60 years be affected in any way?

YES	NO X
YES	NO X

Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)?

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

SECTION C: PUBLIC PARTICIPATION

1. ADVERTISEMENT

The Environmental Assessment Practitioner must follow any relevant guidelines adopted by the competent authority in respect of public participation and must at least –

- 1(a) Fix a notice in a conspicuous place, on the property where it is intended to undertake the activity which states that an application will be submitted to the competent authority in terms of these regulations and which provides information on the proposed nature and location of the activity, where further information on the proposed activity can be obtained and the manner in which representations on the application may be made.
- 1(b) inform landowners and occupiers of adjacent land of the applicant's intention to submit an application to the competent authority
- 1(c) inform landowners and occupiers of land within 100 metres of the boundary of the property where it is proposed to undertake the activity and whom may be directly affected by the proposed activity of the applicant's intention to submit an application to the competent authority;
- 1(d) inform the ward councillor and any organisation that represents the community in the area of the applicant's intention to submit an application to the competent authority;
- 1(e) inform the municipality which has jurisdiction over the area in which the proposed activity will be undertaken of the applicant's intention to submit an application to the competent authority; and
- 1(f) inform any organ of state that may have jurisdiction over any aspect of the activity of the applicant's intention to submit an application to the competent authority; and
- 1(g) place a notice in one local newspaper and any *Gazette* that is published specifically for the purpose of providing notice to the public of applications made in terms of these regulations.

2. LOCAL AUTHORITY PARTICIPATION

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

Has any comment been received from the local authority?

YES	NO
X	

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

The Draft Basic Assessment Report was submitted to the City of Tshwane (CoT) Local Municipality on 1 August 2013. Comments on the Draft Basic Assessment Report were received by CoT on 16 October 2013.

Please refer to Appendix E for the Comments and Issues Register

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

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3. CONSULTATION WITH OTHER STAKEHOLDERS

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

Has any comment been received from stakeholders?

YES	NO
	X

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

--

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

The Draft Basic Assessment Report was submitted to the Department of Water Affairs (DWA) on 1 August 2013. No comments on the Draft Basic Assessment Report were received by the Department. Letters was sent to DWA to confirm the date when the review period ends. Review period was extended for DWA until 18 September 2013 and still no comments were submitted to our office.

Please refer to Appendix E for the Comments and Issues Register and letters sent to DWA

4. GENERAL PUBLIC PARTICIPATION REQUIREMENTS

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

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

5. APPENDICES FOR PUBLIC PARTICIPATION

All public participation information is to be attached in the appropriate Appendix. The information in this Appendix is to be ordered as detailed below

Appendix 1 – Proof of site notice

Appendix 2 – written notices issued to those persons detailed in 1(b) to 1(f) above

Appendix 3 – Proof of newspaper advertisements

Appendix 4 – Communications to and from persons detailed in Point 2 and 3 above

Appendix 5 – minutes of any public and or stakeholder meetings

Appendix 6 - Comments and Responses Report

Appendix 7 – Comments from I&APs on Basic Assessment (BA) Report

Appendix 8 – Comments from I&APs on amendments to the BA report

Appendix 9 – Copy of the register of I&APs

Appendix 10 – Comments from I&APs on the application

Appendix 11 - Other

SECTION D: RESOURCE USE AND PROCESS DETAILS

Note: Section D is to be completed for the proposal

Instructions for completion of Section D for alternatives

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

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

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

This Section D is the same for both the proposed alternative and the site alternative

1. WASTE, EFFLUENT, AND EMISSION MANAGEMENT

Solid waste management

Will the activity produce solid construction waste during the construction/initiation phase?

YES X	NO
Not Available	

If yes, what estimated quantity will be produced per month?

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

During the construction phase the disposal of solid waste will be the responsibility of the developer. An area on the application site will be earmarked for dumping of solid waste to be disposed of during construction. The amount of construction waste will be little. The waste will be carted to registered landfill site.

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

All construction solid waste will be disposed of at the nearest registered dumping site. No solid waste will be dumped on surrounding open areas or adjacent properties.

Will the activity produce solid waste during its operational phase?

YES X	NO
Not Available	

If yes, what estimated quantity will be produced per month?

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

The solid waste on this site will be the mixture of manure and soil forming a biodegradable waste by product. This product will temporarily be stored in the designated storage facilities from where it will be sold or used as fertilizer on cultivated lands. The temporary storage facility for the manure will be properly managed to limit its footprint area and mitigate the odour as far as possible.

BASIC ASSESSMENT REPORT [REGULATION 22(1)]

Has the municipality or relevant service provider confirmed that sufficient air space exists for treating/disposing of the solid waste to be generated by this activity?

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

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

In order to harness the economic value of manure, to enhance the health of cattle and to reduce the generation of dust, the manure-soil mixture will be removed from the feedlot pens. This will lead to the establishment of a temporary manure storage facility. Manure generated on site will thus be managed through the application of simple management actions.

Any medical waste as a result of veterinarian activity on site, such as medicine bottles and syringes, should be dispatched to a medical waste facility in Gauteng.

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

Can any part of the solid waste be classified as hazardous in terms of the relevant legislation?

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

If yes, inform the competent authority and request a change to an application for scoping and EIA.
Is the activity that is being applied for a solid waste handling or treatment facility?

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

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

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

The manure which would have mixed with soil would be stored in a temporary storage facility from where it would be used as a fertilizer to cultivated lands and consequently enhance the physical properties of the soil.

Liquid effluent (other than domestic sewage)

Will the activity produce effluent, other than normal sewage, that will be disposed of in a municipal sewage system?

YES Possibly	NO
-----------------	----

If yes, what estimated quantity will be produced per month?

Not Available

If yes, has the municipality confirmed that sufficient capacity exist for treating / disposing of the liquid effluent to be generated by this activity(ies)?

Not Applicable

Will the activity produce any effluent that will be treated and/or disposed of on site?

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

If yes, what estimated quantity will be produced per month?

Not Available

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

In the case of high precipitation, such as summer rains, it is possible that some manure might mix with water and become liquid and cause runoff from the feedlot. Lining the canals surrounded the feedlot with earthen material such as soil and grass will avoid the contamination of surrounding areas.

BASIC ASSESSMENT REPORT [REGULATION 22(1)]

Liquid effluent (domestic sewage)

Will the activity produce domestic effluent that will be disposed of in a municipal sewage system?

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

If yes, what estimated quantity will be produced per month?

If yes, has the municipality confirmed that sufficient capacity exist for treating / disposing of the domestic effluent to be generated by this activity(ies)?

YES	NO
-----	----

Will the activity produce any effluent that will be treated and/or disposed of on site?

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

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

A conservancy tank will be installed on site to handle the sanitation services of the few workers on site. The conservancy tank will be cleaned out once a month and disposed of at a registered disposal site by a service provider.

Emissions into the atmosphere

Will the activity release emissions into the atmosphere?

YES X	NO
No	

If yes, is it controlled by any legislation of any sphere of government?

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

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

The proposed cattle feedlot is likely to release CO₂ and Methane into the atmosphere. The concentration and quantity hereof will be moderate. These emissions might contribute to an unpleasant odour on the farm. Mitigation measures will be implemented for this reason.

2. WATER USE

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

Municipal	Directly from water board	groundwater	river, stream, dam or lake	other	the activity will not use water
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If water is to be extracted from groundwater, river, stream, dam, lake or any other natural feature, please indicate the volume that will be extracted per month:

Not Available

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

Does the activity require a water use permit from the Department of Water Affairs and Forestry?

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

If yes, list the permits required **Note: Although the answer is no, it was decided to supply some detail regarding the water use permit.**

In terms of the Section 21 of the National Water Act, the developer will need water licenses for the proposed development. The activities that will constitute the essence of the Water Use Licence Application (WULA) include:

- Abstraction of groundwater: borehole – Section 21 (a)
- Storing water – Section 21 (b)
- Engaging in a controlled activity: irrigation of land with water

containing waste – Section 21 (e)

- Discharging water containing waste into a water resource: groundwater affected by irrigation activity – Section 21 (f)
- Disposing of waste which may detrimentally impact water resource: groundwater affected by irrigation activity – Section 21 (g)

If yes, have you applied for the water use permit(s)?

Yes

If yes, have you received approval(s)? (attached in appropriate appendix)

Not yet

3. POWER SUPPLY

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

Not Applicable

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

Not Applicable

4. ENERGY EFFICIENCY

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

The following could be considered:

- Offices and workers' residences could be orientated in a northern direction
- Where possible energy saving light bulbs must be used in the offices and workers' residences as well as outside for the feedlot
- Solar panels can be used to heat the water and geysers and for outdoor lighting.

The developer/farm owner is committed to search and investigate more solutions and opportunities to increase the sustainability of this proposed cattle feedlot development.

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

The EMP for the proposed cattle feedlot development will encourage the use of solar power as alternative energy source.

SECTION E: IMPACT ASSESSMENT

The assessment of impacts must adhere to the minimum requirements in the EIA Regulations, 2006, and should take applicable official guidelines into account. The issues raised by interested and affected parties should also be addressed in the assessment of impacts.

1. ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

Summarise the issues raised by interested and affected parties.

The public participation for the Cattle Feedlot was done in order to ensure that all Interested and Affected Parties register.

The proposed project was advertised in the Beeld newspaper on Tuesday, 5 February 2013 (**Refer to Appendix Ei – Proof of Newspaper advertisement**). Site notices were also erected at prominent points adjacent to the application site on 5 February 2013. (**Refer to Appendix Eii – Proof of Site Notice**). Furthermore Flyers were also distributed to residents, land owners, tenants and stakeholders in the surrounding area (**Refer to Appendix Eiii – Written Notices**).

It is the opinion of Bokamoso that the Public participation was extensive and transparent enough to ensure any comments or issues in regards to the proposed development to be addressed and to suggest possible mitigation measures.

Summary of response from the practitioner to the issues raised by the interested and affected parties
(A full response must be provided in the Comments and Response Report that must be attached to this report):

Not applicable.

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

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

The beneficial and adverse impacts of the proposed development have been discussed below.

The impacts are rated based on consideration of the following:

A). Significance:

- | | | | |
|--------------------------|--------------------|---|---|
| <input type="checkbox"/> | Improbable | - | Low possibility of impact to occur either because of design or historic experience. |
| <input type="checkbox"/> | Probable | - | Distinct possibility that impact will occur. |
| <input type="checkbox"/> | Highly probability | - | Most likely that impact will occur. |
| <input type="checkbox"/> | Definite | - | Impact will occur, in the case of adverse |

			impacts regardless of any prevention measures.
B). Intensity factor:			
<input type="checkbox"/>	Low intensity	-	natural and manmade functions not affected
<input type="checkbox"/>	Medium intensity	-	environment affected but natural and man made functions and processes continue
<input type="checkbox"/>	High intensity	-	environment affected to the extent that natural or man made functions are altered to the extent that it will temporarily or permanently cease
C). Duration:			
<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
<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.

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

Alternative 1 (Proposal) –Agricultural

Potential impacts:	Significance rating of impacts:	Proposed mitigation:	Significance rating of impacts after mitigation:
CONSTRUCTION PHASE			
Beneficial Impacts			
Institutional Environment			
The proposed development will be in line with the current and proposed developments in the vicinity.	High	Not applicable	High
Fauna & Flora			
Eradication of invasive species.	High	Eradication of invasive species during the construction phase would benefit the biophysical environment. Not necessary to mitigate.	High
Social & Economic Environment			
Creation of Job opportunities.	Medium	The proposed development would create job opportunities during the construction phase. Only employing people from the local community could mitigate the potential adverse impact.	Medium
Reduction of areas that have potential for informal settlements and illegal dumping.	High	The proposed township development will prevent informal settlements and illegal dumping on the proposed development areas.	High
Services			
Optimum utilization of services.	High	The proposed development will utilize the existing services which supports development optimally. The developer/facility manager will also manage and provide for the routine maintenance of such services.	High
Adverse Impacts			
Flora & Fauna			
Construction works will cause	Low	• The project should be	None

BASIC ASSESSMENT REPORT [REGULATION 22(1)]

<p>the eradication of some existing vegetation –</p> <p>Site clearance forms part of any project of this scale. Areas of exposed soil will cause erosion and dust pollution. Due to the already moderate disturbance within the study area by cattle grazing, alien plants are present as well as patches of bare soil.</p>		<p>planned to ensure that only specific areas are cleared as the project progress to ensure that large areas are not exposed over long periods;</p> <ul style="list-style-type: none"> • Before the removal of vegetation takes place, the construction area must be clearly marked in order to avoid any unauthorized activities outside the application area; • The individual indigenous tree specimens must be retained on the application site during construction. 	
<p>Uncontrolled fires may cause damage and loss to vegetation and fauna in the area.</p>	Medium	<p>Fires will not be permitted on site.</p>	None
<p>Possible spreading of invaders into the natural surrounding areas.</p>	Low	<p>No plants, not indigenous to the area, or exotic plant species should be introduced into the landscaping of the proposed development.</p>	None
<p>Access road to be built closely bordering a GDARD C-Plan Irreplaceable site may lead to the degradation or isolation of sensitive habitats.</p>	High	<p>A buffer zone should be recognized around the irreplaceable site where new access roads cannot be developed.</p>	Medium
Geology & Soils			
<p>Soil erosion due to drainage systems –</p> <p>During the construction phase temporary measures should be implemented to manage storm water and water flow on the application site. If the storm water and water flow is not regulated and managed on site it could cause significant erosion of soil, as well as the pollution and siltation of water bodies.</p>	Medium	<ul style="list-style-type: none"> • Only the identified areas should be cleared of vegetation. This should be done in stages as construction works progress; • Implement temporary storm water management measures that will help to reduce the speed of the water. This measures must also assist with the prevention of water pollution, erosion and siltation; • If excavations or foundations fill up with storm water, these areas should immediately be drained and measures to prevent further water from 	None

		<p>entering the excavations should be implemented; and</p> <ul style="list-style-type: none"> Erosion control measures should be implemented during the construction phase on large exposed areas and where storm water are temporarily channelled. 	
<p>If not planned and managed correctly topsoil will be lost.</p>	<p>Medium</p>	<ul style="list-style-type: none"> The layout of the construction site should be planned before any construction activities take place. The areas where soil will be compacted by construction activities, heavy vehicle movement, site camp, material storage areas and stockpiling areas should be marked out and the topsoil should be removed; The areas where topsoil will not be removed and which will be conserved during the construction phase should be marked with barrier tape to ensure that vehicles do not move across these areas, and construction activities does not damage the in-situ topsoil; The removed topsoil should be stored separately from all stockpiled materials and subsoil, according to the stockpiling methods as described below. The stockpiled topsoil should be used for rehabilitation purposes after construction has been completed; The installation of services could leave soils exposed and susceptible to erosion. Soils should be stored adjacent to the excavated trenches that are excavated to install services, and this should be filled up with the in-situ material as the services are installed. All stones and 	<p>Low</p>

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		<p>rocks bigger than 80 mm should be removed from the top layer of soil and these disturbed areas should be re-vegetated immediately after works in a specific area are completed to prevent erosion;</p> <ul style="list-style-type: none"> Excavations on site must be kept to minimum and done only one section at a time. Excavated soils must be stockpiled directly on the demarcated area on site. 	
Climate			
Construction during the rainy season can cause delays and damage to the environment.	Low	<ul style="list-style-type: none"> It is recommended that the construction phase be scheduled for the winter months especially activities such as the installation of services, foundations, excavations and road construction; It is also recommended that the precautionary measures be taken in order to prevent the extensive loss of soil during rainstorms; Measures should be implemented during the rainy season to channel storm water away from open excavations and foundations. 	None
Construction during the dry and windy season could cause excessive dust pollution during construction works.	Medium	Regular and effective damping down working areas (especially during the dry and windy periods) must be carried out to avoid dust pollution that will have a negative impact on the surrounding environment. When necessary, these working areas should be damped down at least twice a day.	Low
Hydrology & Groundwater			
The use of insufficient drainage systems.	Medium	A storm water management plan should be designed to ensure sufficient drainage on site especially around the buildings and ensure proper collection of manure runoff.	None

BASIC ASSESSMENT REPORT [REGULATION 22(1)]

<p>Excavated materials that are stockpiled in wrong areas can interfere with the natural drainage.</p>	<p align="center">Medium</p>	<p>An area must be allocated for stockpiling of topsoil before any construction take place on the application site. The stockpiles must be situated away from any water source or drainage channel. A sediment fence or barrier must be constructed around the stockpile, to prevent soil from washing away by rain or any water.</p>	<p align="center">Low</p>
<p align="center">Cultural and Archaeology</p>			
<p>Occurrence of cultural historical assets on the proposed development site.</p>	<p align="center">Medium</p>	<p>If archaeological sites are exposed during construction work, it should immediately be reported to a museum, preferably on at which an archaeologist are available so that an investigation and evaluation of the site can be made.</p>	<p align="center">None</p>
<p align="center">Air pollution</p>			
<p>Nuisance to neighbours in terms of dust generation due to construction during the dry and windy season. The long gravel access road will contribute to even more dust.</p>	<p align="center">High</p>	<p>The application site and access roads must be damped at a regular basis with water (more or less 3 to 4 times on a dry day). A water tanker should be used if possible.</p>	<p align="center">Medium</p>
<p align="center">Roads and Traffic</p>			
<p>Restrictions of access to surrounding properties and the study area during construction phases.</p>	<p align="center">Medium</p>	<ul style="list-style-type: none"> • To minimize the impacts or risks, heavy construction vehicles should avoid using the local road network during peak traffic times. • These vehicles should use only specific roads and strictly keep within the speed limits and abide to all traffic laws. No speeding or reckless driving should be allowed. Access to the site for construction vehicles should be planned to minimize the impact on the surrounding network; and • Warning signs should be erected on the roads that these vehicles will use, at big crossings/ access roads and on the site if needed. 	<p align="center">Low</p>

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Damage to roads	Medium	<ul style="list-style-type: none"> • Specific roads must be allocated for the use by construction vehicles; • Roads that will be used by construction vehicles is largely gravel roads and therefore a low speed should be maintained by all construction vehicles; • If necessary, dust suppression measures should be implemented on problem areas along the gravel road. 	Low
Safety and Security			
During the construction phase safety and security problems (especially for the surrounding residents) are likely to occur.	Medium	Construction must be completed in as short time as possible. No construction worker or relative may reside on the application site during the construction phase. All construction workers must leave the site at the end of a days work. A security guard should be appointed on site to prevent any security problems.	Low
Any proposed development offers the potential for unplanned informal settlement (squatting) before construction commences or after construction.	Medium	No construction worker, friend or relative may settle/ reside on site. Only security may be present on site after construction hours.	Low
Construction activities could cause danger to children and animals of the surrounding residents.	Low	<ul style="list-style-type: none"> • Although regarded as a normal practice, it is important to erect proper signs indicating the operation of heavy vehicles in the vicinity of dangerous crossings and access roads or even with in the development site, if necessary; • It is also important to indicate all areas where excavations took place/ are taking place and warning signs that clearly indicate areas with excavations must be placed immediately adjacent to excavations; • A barrier should be established around 	None

BASIC ASSESSMENT REPORT [REGULATION 22(1)]

		<p>dangerous excavation areas;</p> <ul style="list-style-type: none"> • With the exception of appointed security personnel, no other worker, friend or relatives will be allowed to sleep on the construction site (weekends included), in the public open space or on adjacent properties; and • No worker should be allowed to enter adjacent private properties without written consent of the legal owners to the contractor. 	
Visual Impact			
Dumping of builder's rubble on neighbouring properties.	Medium	A specific location for building rubble must be allocated on site, to concentrate and collect the building rubble and cart it to a certified landfill site. The allocated area must be out of sight of neighbouring properties to have a less visual impact.	Low
Stockpile areas for construction materials.	Medium	An area on the site must be allocated for the stockpile of construction materials. The area must be situated on the application site, and must be situated to have a minimal visual impact on the neighbouring area and not easily blown around by wind.	Low
Veld fires may cause damage to infrastructure, vegetation and neighbouring properties.	Low	A specific area on site must be allocated, which will have the least impact on the environment on the environment and surrounding landowners, for fires of construction workers. This allocated area must be far from any structures and no fires may be lit except in the designated location.	Low
The construction vehicles, the site camp and other construction related facilities will have a negative visual impact during the construction phase.	Medium	Before any construction commence on site, an area on site must be demarcated for a site camp.	Low

Waste Management			
<p>Site office, camp and associated waste (visual, air and soil pollution)</p>	<p>Medium</p>	<ul style="list-style-type: none"> • Temporary waste storage points on site shall be determined. These storage points shall be accessible by waste removal trucks; • These points should not be located in areas highly visible from the properties of the surrounding landowners/ tenants/ in areas where the wind direction will carry bad odours across the properties of adjacent tenants or landowners; • The site camp and the rest of the study area should appear neat at all times; • Waste materials should be removed from the site on a regular basis, to a registered dumping site; and • The site camp should not be located in a highly visual area on the study area, or a screen or barrier should be erected as not have a negative impact on the sense of place. 	<p>Low</p>
<p>Disposal of building waste & liquids</p>	<p>Medium</p>	<ul style="list-style-type: none"> • All the waste generated by the proposed developments must be dumped at a preselected area on site to be carted to a register landfill site; • THESE AREAS SHALL BE PREDETERMINED AND LOCATED IN AREAS THAT ARE ALREADY DISTURBED; • Small lightweight waste items should be contained in skips with lids to prevent wind littering; • All waste must be removed to a recognized waste disposal site/ landfill site on a weekly basis. No waste materials may be disposed of on or adjacent to the site; • The storage of solid waste on site, until such time that it 	<p>Low</p>

		<p>may be disposed of, must be in the manner acceptable to the local authority; and</p> <ul style="list-style-type: none"> • Keep records of waste reuse, recycling and disposal for future reference. 	
OPERATIONAL PHASE			
Beneficial Impacts			
Social & Economic Environment			
Creation of temporary and permanent jobs.	Medium	During the operational phase numerous permanent jobs will be created.	Medium
Increasing the supply of good quality food	High	In the long term the proposed development will increase the supply of good quality meat to the society. This will be of economical value to the society as well.	High
Reduction of areas that have potential for informal settlements and illegal dumping.	High	The proposed cattle feedlot will prevent informal settlements and illegal dumping on the proposed development area as agricultural activity will increase and it will not be seen as vacant land for potential informal settlements and illegal dumping.	High
Adverse Impacts			
Hydrology			
The pollution of ground- and surface water.	High	<ul style="list-style-type: none"> • The cattle feedlot will be placed 400 meters away from wetland areas. All runoff from the feedlot will be caught up in channels surrounding the feedlot; • Water puddles accumulating at the manure stockpiles should be covered with dry manure and placed back on top of the stockpile; and • Control of flies and other insects by using pesticides, or any chemical spray, can lead to contamination of ground and surface water. 	Low

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		Therefore, only use registered products and return empty containers to the supplier.	
An increase in surface water runoff to storm water management systems (because of an increase of hard-surfaces such as roofs and compacted areas), may have an impact on surface quality and quantities.	Medium	<ul style="list-style-type: none"> • Storm water through the site should be managed to accommodate the higher quantities of runoff; • Sheet flow should be encouraged as far as possible, and channels should be designed sufficiently to address the problem of erosion; and • Within the feedlot pens, runoff channels that drain the surface must be channelled to a retention dam for evaporation. 	Low
Reduction in ground water level	Medium	The amount of ground water used need to remain within the limits as provided by a geohydrologist or Integrated Water Use License Conditions.	Low
Leaking pipes could cause ground water pollution risks.	Low	Pipes should be inspected on a regular basis.	None
Fauna and Flora			
Access road closely bordering a GDARD C-Plan Irreplaceable site may lead to the degradation or isolation of sensitive habitats.	High	A buffer zone should be recognized around the irreplaceable site where no activity will be allowed and no vehicles will be allowed to drive in close proximity to the Irreplaceable site.	Medium
Air and Noise			
<p>The generation of air pollution –</p> <ul style="list-style-type: none"> • Emissions released into the atmosphere • Odour nuisance • Dust generation 	Medium	<ul style="list-style-type: none"> • The proposed development of a cattle feedlot will not have a significant impact through emissions into the atmosphere; • The proposed cattle feedlot will be situated 400 meters away from the nearest neighbouring residence; • The odour need to be managed by regularly removing manure from the feedlot to the temporary storage facility; 	Low

		<ul style="list-style-type: none"> • Due to trampling by the cattle, the feedlot will generate dust and this can be mitigated by spraying little water on dry areas. Keeping the feedlot pad 30-40% moist will also help with the offensive odours; • Material covers can be used to cover the manure storage areas; • The feed additive, Rumensin, can be added to feed of cattle as it reduces the production (and thus emission) of methane gas. This additive also increases the growth rate of cattle; and • The access road should be sprayed with water to suppress dust generation; 	
The generation of noise pollution	Low	The proposed cattle feedlot will not have a significant noise impact on the environment. The feedlot will be situated at least 400 meters away from the nearest neighbouring residence.	Low
Roads & Traffic			
Additional vehicle traffic could have an impact on the existing roads with in the vicinity of proposed development.	Medium	The road network which surrounds the proposed development will have to be correctly maintained in order to support additional movement of vehicles. Transport should be limited to non-peak hours.	Low
Waste management			
Waste Handling – polluting the surrounding areas.	Medium	Plastic and glass bottles containing hazardous/chemical materials, especially veterinary medicine residues, should be stored separately and be collected and disposed of by a certified waste management company.	Low
Prevent contamination of surface or groundwater resources	Medium	<u>Removal and storage of solid waste:</u> <ul style="list-style-type: none"> • Most of the manure from 	Low

		<p>cattle lot-fed in paddocks for relatively short periods is incorporated into the soil and the cattle should be periodically rotated between paddocks to ensure the manure loading is not excessive.</p> <ul style="list-style-type: none"> • Manure from intensive feedlots, where the cattle are confined in high densities or on hard stand for extended periods, should be scraped up and removed as necessary. • The frequency with which pens are cleaned will depend on factors such as the stocking density and the size of the animals. • Manure should be stored in a stockpile on an impervious surface where water from rain, sprinklers or surface drainage cannot access the manure (or where any run-off drains back to holding ponds). • Manure can be stored for an extended period until it is used on the farm or is removed off-site for use or disposal in a manner approved by the relevant legislative body. • Low moisture content in the manure will minimise odour and generation of leachate. • Aerobic composting of the manure (in turned piles or rows) may be used to stabilise the waste and reduce the incidence of disease-causing organisms. <p><u>Disposal of solid waste over land:</u></p> <ul style="list-style-type: none"> • The soil where solid feedlot waste is to be spread needs to be suitable for, and able to sustain, the agronomic regimes proposed. The disposal area also needs to be able to accommodate the water, nutrient, salt and 	
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		<p>organic loads involved.</p> <ul style="list-style-type: none"> • Land application should be timed to promote most benefit to site vegetation and minimise leaching of nutrients to surface and groundwater. • Manure should be incorporated into the soil where possible. Otherwise, manure should be spread evenly over the land surface using a manure spreader of suitable design. • Vegetation cover should be maintained on the disposal area to prevent soil erosion and to enhance nutrient uptake. 	
<p>Nutrient-rich wastewater should not contaminate any surface water body or groundwater resource.</p>	<p>Medium</p>	<p><u>Removal of liquid waste:</u></p> <ul style="list-style-type: none"> • Clean stormwater should be channelled away from the feedlot area, using bunds, culverts or drains, to ensure it does not become contaminated with manure or urine. • Any contaminated water from areas outside the feedlot, including stormwater run-off, should (wherever possible) be directed via drains to a settling pond lined with very low permeability clay or plastic. This water should then be suitable for discharge to an irrigation area. • Surface run-off from the feedlot should be collected in a drainage channel, with a sufficient cross-section. To prevent effluent being washed into a watercourse, all contaminated flows should be directed to stabilisation ponds for treatment before being spread over land by tanker or irrigation. • Where liquid and solid waste is combined and drain to a pond, effluent treatment is recommended 	<p>Low</p>

		<p>using a multi-pond stabilisation system, incorporating anaerobic and aerobic treatment.</p> <p><u>Storage of liquid waste in settling ponds:</u></p> <ul style="list-style-type: none"> • Where possible, solids and larger suspended matter should be removed from the effluent stream by the use of coarse screening equipment prior to entering a settling pond. • The capacity of any settling pond should provide adequate retention time for entrained solids to settle out (one and a half to two hours are normally satisfactory). • Adequate free board should be provided to prevent stormwater overflowing from the pond. The outflow from the settling pond should be conveyed either to a holding pond before irrigation over land or to wastewater stabilisation ponds. Captured solids should be applied to land in a sustainable manner using crop nutrient needs and status of soil. The nutrient loading to land is a cumulative loading from all sources, i.e. solid manures, liquids and any artificial fertiliser added. <p><u>Disposal of liquid waste over land:</u></p> <ul style="list-style-type: none"> • In some instances, it may be possible to retain all liquid waste for evaporation in shallow ponds. Liquid waste can be disposed of raw or after treatment (e.g. by ponding). Treatment will reduce the Biological Oxygen Demand (BOD) of the effluent and will allow the waste to be applied over a much smaller area 	
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		<p>due to reduced odours. The waste disposal area should be located at such a distance that it would not contaminate surface and groundwater resources.</p> <ul style="list-style-type: none"> • Where wastewater is irrigated over aquifers, monitoring may be required to allow early detection and management of adverse environmental impacts. • Sufficient land disposal area should be available for a 10 to 14-day rest period between applications on any given part of the area, the objective being to alternate between anaerobic and aerobic conditions in the top layer of soil. Shorter periods may be acceptable under dry summer conditions. • Crops or pasture should be maintained to take up as much as possible of the nitrogen and phosphorus from the wastewater to prevent pollution of any ground or surface waters and minimise erosion. <p>Irrigation systems may include (1) Flood irrigation, (2) Sprinkler irrigation and (3) Trickle irrigation. The latter is generally not suitable for effluent, due to clogging problems.</p>	
Other Impacts			
Spreading of pathogens in the feedlot	Low	It is important to keep the feedlot as clean as possible and transfer the manure from the feedlot to the manure storage facility on a regular basis. An open feedlot, without a roof, will expose the pathogens to direct sunlight.	Low
Flies and other vector insects	Medium	The proposed cattle feedlot will be situated at least 400 meters from the nearest neighbouring residence.	Low

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		Manure will be regularly removed from the feedlot and put in the temporary manure storage facility. The feedlot will be kept as dry as possible. Regular veterinarian inspections are recommended for the proposed cattle feedlot.	
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Alternative 2 –Agricultural (Site alternative)

Potential impacts:	Significance rating of impacts:	Proposed mitigation:	Significance rating of impacts after mitigation:
CONSTRUCTION PHASE			
Beneficial Impacts			
Institutional Environment			
The proposed development will be in line with the current and proposed developments in the vicinity.	High	Not applicable	High
Fauna & Flora			
Eradication of invasive species.	High	Eradication of invasive species during the construction phase would benefit the biophysical environment. Not necessary to mitigate.	High
Social & Economic Environment			
Creation of Job opportunities.	Medium	The proposed development would create job opportunities during the construction phase. Only employing people from the local community could mitigate the potential adverse impact.	Medium
Reduction of areas that have potential for informal settlements and illegal dumping.	High	The proposed township development will prevent informal settlements and illegal dumping on the proposed development areas.	High
Services			
Optimum utilization of	High	The proposed development	High

services.		will utilize the existing services which supports development optimally. The developer/facility manager will also manage and provide for the routine maintenance of such services.	
Adverse Impacts			
Flora & Fauna			
<p>Construction works will cause the eradication of some existing vegetation –</p> <p>Site clearance forms part of any project of this scale. Areas of exposed soil will cause erosion and dust pollution. Due to the already moderate disturbance within the study area by cattle grazing, alien plants are present as well as patches of bare soil.</p>	Low	<ul style="list-style-type: none"> • The project should be planned to ensure that only specific areas are cleared as the project progress to ensure that large areas are not exposed over long periods; • Before the removal of vegetation takes place, the construction area must be clearly marked in order to avoid any unauthorized activities outside the application area; • The individual indigenous tree specimens must be retained on the application site during construction. 	None
Uncontrolled fires may cause damage and loss to vegetation and fauna in the area.	Medium	Fires will not be permitted on site.	None
Possible spreading of invaders into the natural surrounding areas.	Low	No plants, not indigenous to the area, or exotic plant species should be introduced into the landscaping of the proposed development.	None
Geology & Soils			
<p>Soil erosion due to drainage systems –</p> <p>During the construction phase temporary measures should be implemented to manage storm water and water flow on the application site. If the storm water and water flow is not regulated and managed on site it could cause significant erosion of soil, as well as the pollution and</p>	Medium	<ul style="list-style-type: none"> • Only the identified areas should be cleared of vegetation. This should be done in stages as construction works progress; • Implement temporary storm water management measures that will help to reduce the speed of the water. This measures must also assist with the prevention of water pollution, erosion and 	None

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<p>siltation of water bodies.</p>		<p>siltation;</p> <ul style="list-style-type: none"> • If excavations or foundations fill up with storm water, these areas should immediately be drained and measures to prevent further water from entering the excavations should be implemented; and • Erosion control measures should be implemented during the construction phase on large exposed areas and where storm water are temporarily channelled. 	
<p>If not planned and managed correctly topsoil will be lost.</p>	<p>Medium</p>	<ul style="list-style-type: none"> • The layout of the construction site should be planned before any construction activities take place. The areas where soil will be compacted by construction activities, heavy vehicle movement, site camp, material storage areas and stockpiling areas should be marked out and the topsoil should be removed; • The areas where topsoil will not be removed and which will be conserved during the construction phase should be marked with barrier tape to ensure that vehicles do not move across these areas, and construction activities does not damage the in-situ topsoil; • The removed topsoil should be stored separately from all stockpiled materials and subsoil, according to the stockpiling methods as described below. The stockpiled topsoil should be used for rehabilitation purposes after construction has been completed; • The installation of services could leave soils exposed and susceptible to erosion. Soils should be stored 	<p>Low</p>

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		<p>adjacent to the excavated trenches that are excavated to install services, and this should be filled up with the in-situ material as the services are installed. All stones and rocks bigger than 80 mm should be removed from the top layer of soil and these disturbed areas should be re-vegetated immediately after works in a specific area are completed to prevent erosion;</p> <ul style="list-style-type: none"> • Excavations on site must be kept to minimum and done only one section at a time. Excavated soils must be stockpiled directly on the demarcated area on site. 	
Climate			
<p>Construction during the rainy season can cause delays and damage to the environment.</p>	Low	<ul style="list-style-type: none"> • It is recommended that the construction phase be scheduled for the winter months especially activities such as the installation of services, foundations, excavations and road construction; • It is also recommended that the precautionary measures be taken in order to prevent the extensive loss of soil during rainstorms; • Measures should be implemented during the rainy season to channel storm water away from open excavations and foundations. 	None
<p>Construction during the dry and windy season could cause excessive dust pollution during construction works.</p>	Medium	<p>Regular and effective damping down working areas (especially during the dry and windy periods) must be carried out to avoid dust pollution that will have a negative impact on the surrounding environment. When necessary, these working areas should be damped down at least twice a day.</p>	Low
Hydrology & groundwater			

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The use of insufficient drainage systems.	Medium	A storm water management plan should be designed to ensure sufficient drainage on site especially around the buildings and ensure proper collection of manure runoff.	None
Excavated materials that are stockpiled in wrong areas can interfere with the natural drainage.	Medium	An area must be allocated for stockpiling of topsoil before any construction take place on the application site. The stockpiles must be situated away from any water source or drainage channel. A sediment fence or barrier must be constructed around the stockpile, to prevent soil from washing away by rain or any water.	Low
Cultural and Archaeology			
Occurrence of cultural historical assets on the proposed development site.	Medium	If archaeological sites are exposed during construction work, it should immediately be reported to a museum, preferably on at which an archaeologist are available so that an investigation and evaluation of the site can be made.	None
Air pollution			
Nuisance to neighbours in terms of dust generation due to construction during the dry and windy season.	Medium	The application site must be damped at a regular basis with water (more or less 3 to 4 times on a dry day). A water tanker should be used if possible.	Low
Roads and Traffic			
Restrictions of access to surrounding properties and the study area during construction phases.	Medium	<ul style="list-style-type: none"> • To minimize the impacts or risks, heavy construction vehicles should avoid using the local road network during peak traffic times; • These vehicles should use only specific roads and strictly keep within the speed limits and abide to all traffic laws. No speeding or reckless driving should be allowed. Access to the site for construction vehicles should be planned to minimize the impact on the 	Low

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		<p>surrounding network; and</p> <ul style="list-style-type: none"> Warning signs should be erected on the roads that these vehicles will use, at big crossings/ access roads and on the site if needed. 	
Damage to roads	Medium	<ul style="list-style-type: none"> Specific roads must be allocated for the use by construction vehicles; Roads that will be used by construction vehicles is largely gravel roads and therefore a low speed should be maintained by all construction vehicles; If necessary, dust suppression measures should be implemented on problem areas along the gravel road. 	Low
Safety and Security			
During the construction phase safety and security problems (especially for the surrounding residents) are likely to occur.	Medium	Construction must be completed in as short time as possible. No construction worker or relative may reside on the application site during the construction phase. All construction workers must leave the site at the end of a days work. A security guard should be appointed on site to prevent any security problems.	Low
Any proposed development offers the potential for unplanned informal settlement (squatting) before construction commences or after construction.	Medium	No construction worker, friend or relative may settle/ reside on site. Only security may be present on site after construction hours.	Low
Construction activities could cause danger to children and animals of the surrounding residents.	Low	<ul style="list-style-type: none"> Although regarded as a normal practice, it is important to erect proper signs indicating the operation of heavy vehicles in the vicinity of dangerous crossings and access roads or even with in the development site, if necessary; It is also important to indicate all areas where excavations took place/ are taking place and 	None

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		<p>warning signs that clearly indicate areas with excavations must be placed immediately adjacent to excavations;</p> <ul style="list-style-type: none"> • A barrier should be established around dangerous excavation areas; • With the exception of appointed security personnel, no other worker, friend or relatives will be allowed to sleep on the construction site (weekends included), in the public open space or on adjacent properties; and • No worker should be allowed to enter adjacent private properties without written consent of the legal owners to the contractor. 	
Visual Impact			
Dumping of builder's rubble on neighbouring properties.	Medium	A specific location for building rubble must be allocated on site, to concentrate and collect the building rubble and cart it to a certified landfill site. The allocated area must be out of sight of neighbouring properties to have a less visual impact.	Low
Stockpile areas for construction materials.	Medium	An area on the site must be allocated for the stockpile of construction materials. The area must be situated on the application site, and must be situated to have a minimal visual impact on the neighbouring area and not easily blown around by wind.	Low
Veld fires may cause damage to infrastructure, vegetation and neighbouring properties.	Low	A specific area on site must be allocated, which will have the least impact on the environment on the environment and surrounding landowners, for fires of construction workers. This allocated area must be far from any structures and no fires may be lit except in the designated location.	Low

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<p>The construction vehicles, the site camp and other construction related facilities will have a negative visual impact during the construction phase.</p>	<p align="center">Medium</p>	<p>Before any construction commence on site, an area on site must be demarcated for a site camp.</p>	<p align="center">Low</p>
<p align="center">Waste Management</p>			
<p>Site office, camp and associated waste (visual, air and soil pollution)</p>	<p align="center">Medium</p>	<ul style="list-style-type: none"> • Temporary waste storage points on site shall be determined. These storage points shall be accessible by waste removal trucks; • These points should not be located in areas highly visible from the properties of the surrounding landowners/ tenants/ in areas where the wind direction will carry bad odours across the properties of adjacent tenants or landowners; • The site camp and the rest of the study area should appear neat at all times; • Waste materials should be removed from the site on a regular basis, to a registered dumping site; and • The site camp should not be located in a highly visual area on the study area, or a screen or barrier should be erected as not have a negative impact on the sense of place. 	<p align="center">Low</p>
<p>Disposal of building waste & liquids</p>	<p align="center">Medium</p>	<ul style="list-style-type: none"> • All the waste generated by the proposed developments must be dumped at a preselected area on site to be carted to a register landfill site; • THESE AREAS SHALL BE PREDETERMINED AND LOCATED IN AREAS THAT ARE ALREADY DISTURBED.; • Small lightweight waste items should be contained in skips with lids to prevent wind littering; • All waste must be removed to a recognized waste 	<p align="center">Low</p>

		<p>disposal site/ landfill site on a weekly basis. No waste materials may be disposed of on or adjacent to the site;</p> <ul style="list-style-type: none"> • The storage of solid waste on site, until such time that it may be disposed of, must be in the manner acceptable to the local authority; and • Keep records of waste reuse, recycling and disposal for future reference. 	
OPERATIONAL PHASE			
Beneficial Impacts			
Social & Economic Environment			
Creation of temporary and permanent jobs.	Medium	During the operational phase numerous permanent jobs will be created.	Medium
Increasing the supply of good quality food	High	In the long term the proposed development will increase the supply of good quality meat to the society. This will be of economical value to the society as well.	High
Reduction of areas that have potential for informal settlements and illegal dumping.	High	The proposed cattle feedlot will prevent informal settlements and illegal dumping on the proposed development area as agricultural activity will increase and it will not be seen as vacant land for potential informal settlements and illegal dumping.	High
Adverse Impacts			
Hydrology			
The pollution of ground- and surface water.	High	<ul style="list-style-type: none"> • The cattle feedlot will be placed 400 meters away from wetland areas. All runoff from the feedlot will be caught up in channels surrounding the feedlot; • Water puddles accumulating at the manure stockpiles should be covered with dry 	Low

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		<p>manure and placed back on top of the stockpile; and</p> <ul style="list-style-type: none"> Control of flies and other insects by using pesticides, or any chemical spray, can lead to contamination of ground and surface water. Therefore, only use registered products and return empty containers to the supplier. 	
<p>An increase in surface water runoff to storm water management systems (because of an increase of hard-surfaces such as roofs and compacted areas), may have an impact on surface quality and quantities.</p>	Medium	<ul style="list-style-type: none"> Storm water through the site should be managed to accommodate the higher quantities of runoff; Sheet flow should be encouraged as far as possible, and channels should be designed sufficiently to address the problem of erosion; and Within the feedlot pens, runoff channels that drain the surface must be channelled to a retention dam for evaporation. 	Low
<p>Reduction in ground water level</p>	Medium	<p>The amount of ground water used need to remain within the limits as provided by a geohydrologist or Integrated Water Use License Conditions.</p>	Low
<p>Leaking pipes could cause ground water pollution risks.</p>	Low	<p>Pipes should be inspected on a regular basis.</p>	None
Air and Noise			
<p>The generation of air pollution –</p> <ul style="list-style-type: none"> Emissions released into the atmosphere Odour nuisance Dust generation 	Medium	<ul style="list-style-type: none"> The proposed development of a cattle feedlot will not have a significant impact through emissions into the atmosphere; The proposed cattle feedlot will be situated 400 meters away from the nearest neighbouring residence; The odour need to be managed by regularly removing manure from the feedlot to the temporary storage facility; Due to trampling by the cattle, the feedlot will generate dust and this can 	Low

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		<p>be mitigated by spraying little water on dry areas. Keeping the feedlot pad 30-40% moist will also help with the offensive odours;</p> <ul style="list-style-type: none"> • Material covers can be used to cover the manure storage areas; and • The feed additive, Rumensin, can be added to feed of cattle as it reduces the production (and thus emission) of methane gas. This additive also increases the growth rate of cattle. 	
The generation of noise pollution	Low	The proposed cattle feedlot will not have a significant noise impact on the environment. The feedlot will be situated at least 400 meters away from the nearest neighbouring residence.	Low
Roads & Traffic			
Additional vehicle traffic could have an impact on the existing roads with in the vicinity of proposed development.	Medium	The road network which surrounds the proposed development will have to be correctly maintained in order to support additional movement of vehicles. Transport should be limited to non-peak hours.	Low
Waste management			
Waste Handling – polluting the surrounding areas.	Medium	Plastic and glass bottles containing hazardous/chemical materials, especially veterinary medicine residues, should be stored separately and be collected and disposed of by a certified waste management company.	Low
Prevent contamination of surface or groundwater resources	Medium	<p><u>Removal and storage of solid waste:</u></p> <ul style="list-style-type: none"> • Most of the manure from cattle lot-fed in paddocks for relatively short periods is incorporated into the soil and the cattle should be periodically rotated between paddocks to 	Low

		<p>ensure the manure loading is not excessive.</p> <ul style="list-style-type: none"> • Manure from intensive feedlots, where the cattle are confined in high densities or on hard stand for extended periods, should be scraped up and removed as necessary. • The frequency with which pens are cleaned will depend on factors such as the stocking density and the size of the animals. • Manure should be stored in a stockpile on an impervious surface where water from rain, sprinklers or surface drainage cannot access the manure (or where any run-off drains back to holding ponds). • Manure can be stored for an extended period until it is used on the farm or is removed off-site for use or disposal in a manner approved by the relevant legislative body. • Low moisture content in the manure will minimise odour and generation of leachate. • Aerobic composting of the manure (in turned piles or rows) may be used to stabilise the waste and reduce the incidence of disease-causing organisms. <p><u>Disposal of solid waste over land:</u></p> <ul style="list-style-type: none"> • The soil where solid feedlot waste is to be spread needs to be suitable for, and able to sustain, the agronomic regimes proposed. The disposal area also needs to be able to accommodate the water, nutrient, salt and organic loads involved. • Land application should be timed to promote most benefit to site vegetation and minimise leaching of nutrients to surface and 	
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		<p>groundwater.</p> <ul style="list-style-type: none"> • Manure should be incorporated into the soil where possible. Otherwise, manure should be spread evenly over the land surface using a manure spreader of suitable design. • Vegetation cover should be maintained on the disposal area to prevent soil erosion and to enhance nutrient uptake. 	
<p>Nutrient-rich wastewater should not contaminate any surface water body or groundwater resource.</p>	<p>Medium</p>	<p><u>Removal of liquid waste:</u></p> <ul style="list-style-type: none"> • Clean stormwater should be channelled away from the feedlot area, using bunds, culverts or drains, to ensure it does not become contaminated with manure or urine. • Any contaminated water from areas outside the feedlot, including stormwater run-off, should (wherever possible) be directed via drains to a settling pond lined with very low permeability clay or plastic. This water should then be suitable for discharge to an irrigation area. • Surface run-off from the feedlot should be collected in a drainage channel, with a sufficient cross-section. To prevent effluent being washed into a watercourse, all contaminated flows should be directed to stabilisation ponds for treatment before being spread over land by tanker or irrigation. • Where liquid and solid waste is combined and drain to a pond, effluent treatment is recommended using a multi-pond stabilisation system, incorporating anaerobic and aerobic treatment. 	<p>Low</p>

		<p><u>Storage of liquid waste in settling ponds:</u></p> <ul style="list-style-type: none"> • Where possible, solids and larger suspended matter should be removed from the effluent stream by the use of coarse screening equipment prior to entering a settling pond. • The capacity of any settling pond should provide adequate retention time for entrained solids to settle out (one and a half to two hours are normally satisfactory). • Adequate free board should be provided to prevent stormwater overflowing from the pond. The outflow from the settling pond should be conveyed either to a holding pond before irrigation over land or to wastewater stabilisation ponds. Captured solids should be applied to land in a sustainable manner using crop nutrient needs and status of soil. The nutrient loading to land is a cumulative loading from all sources, i.e. solid manures, liquids and any artificial fertiliser added. <p><u>Disposal of liquid waste over land:</u></p> <ul style="list-style-type: none"> • In some instances, it may be possible to retain all liquid waste for evaporation in shallow ponds. Liquid waste can be disposed of raw or after treatment (e.g. by ponding). Treatment will reduce the Biological Oxygen Demand (BOD) of the effluent and will allow the waste to be applied over a much smaller area due to reduced odours. The waste disposal area should be located at such a distance that it would not contaminate surface and 	
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		<p>groundwater resources.</p> <ul style="list-style-type: none"> • Where wastewater is irrigated over aquifers, monitoring may be required to allow early detection and management of adverse environmental impacts. • Sufficient land disposal area should be available for a 10 to 14-day rest period between applications on any given part of the area, the objective being to alternate between anaerobic and aerobic conditions in the top layer of soil. Shorter periods may be acceptable under dry summer conditions. • Crops or pasture should be maintained to take up as much as possible of the nitrogen and phosphorus from the wastewater to prevent pollution of any ground or surface waters and minimise erosion. <p>Irrigation systems may include (1) Flood irrigation, (2) Sprinkler irrigation and (3) Trickle irrigation. The latter is generally not suitable for effluent, due to clogging problems.</p>	
Other Impacts			
Spreading of pathogens in the feedlot	Low	It is important to keep the feedlot as clean as possible and transfer the manure from the feedlot to the manure storage facility on a regular basis. An open feedlot, without a roof, will expose the pathogens to direct sunlight.	Low
Flies and other vector insects	Medium	The proposed cattle feedlot will be situated at least 400 meters from the nearest neighbouring residence. Manure will be regularly removed from the feedlot and put in the temporary manure storage facility. The feedlot will be kept as dry as possible.	Low

BASIC ASSESSMENT REPORT [REGULATION 22(1)]

		Regular veterinarian inspections are recommended for the proposed cattle feedlot.	
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List any specialist reports that were used to fill in the above tables. Such reports are to be attached in the appropriate Appendix.

- Ecological Fauna Habitat Survey (Appendix G1)**
- Wetland Assessment (Appendix G2)**
- Vegetation Assessment Report (Appendix G3)**
- Geohydrological Investigation (G4)**

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

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

Alternative 1 (Proposal) – Agricultural

Potential impacts:	Significance rating of impacts:	Proposed mitigation:	Significance rating of impacts after mitigation:
Geology & Soils			
Soil erosion, siltation and gully formation.	Medium	Demolition works must be kept to a minimum on site and only be done one section at a time to prevent excessive open soil areas that could lead to soil erosion, siltation and excessive compaction.	Low
Water seepage at shallow depth could cause instability of soil or water pollution.	Medium	Geotechnical and civil engineers must supply mitigation measures and guidelines to prevent problems.	Low
Hydrology & Groundwater			
Vehicle maintenance.	Medium	Vehicle maintenance may not be done on the application site. Whenever a vehicle needs maintenance it must be taken to a certified workshop for the maintenance.	None

BASIC ASSESSMENT REPORT [REGULATION 22(1)]

<p>Excavated materials that are stockpiled in the wrong areas can interfere with the natural drainage.</p>	<p align="center">Medium</p>	<p>An area must be allocated for stockpiling of topsoil before any demolishing of buildings take place on the site and must be situated from any water source or drainage channels. A sediment fence or barrier must be constructed around the stockpile to prevent soil from washing away by rain or any water.</p>	<p align="center">Low</p>
<p>Surface water flows will be altered during the decommissioning phase.</p>	<p align="center">Medium</p>	<p>Due to the demolishing that will take place (there will be trenches, topsoil and subsoil mounds in and around the area), the topography of the site will temporarily be altered.</p>	<p align="center">Low</p>
<p>Pollution of surface water</p>	<p align="center">High</p>	<ul style="list-style-type: none"> • Decommissioning should take place during the winter months when precipitation is low; • All dry manure from the feedlot as well as the storage facilities should be sold and used for fertilizing purposes; • Rehabilitate and revegetate the feedlot and storage facility areas; • Groundwater monitoring for 12 months after decommissioning. 	<p align="center">Low</p>
<p>The possibility of groundwater pollution.</p>	<p align="center">High</p>	<ul style="list-style-type: none"> • Develop a central waste temporary holding site to be used during decommissioning (near the access entrance). This site should comply with the following: <ul style="list-style-type: none"> ◦ Skips for the containment and disposal of all waste that could cause soil and water pollution, 	<p align="center">Low</p>

		<p>i.e. paint, lubricants, etc.;</p> <ul style="list-style-type: none"> ○ Workers will only be allowed to use temporary chemical toilets on the site; ○ No french drain systems may be installed on site at any time; • No leaking vehicle shall be allowed on site. Before entering the area, all vehicles and equipment shall be inspected for leaks by a qualified mechanic/other suitably qualified person and the environmental officer. The mechanic/ the mechanic of the appointed contractor must supply the environmental officer with a letter of confirmation that the vehicles and equipment are leak proof; • If maintenance on site is absolutely necessary, it should be conducted on a concrete surface in the site camp. Spilled oil should be cleaned up and disposed off appropriately (not dumped on site). This area may not be washed with soaps and dissolvent and allowed to enter the drainage system; • Decommissioning should take place during the winter months when precipitation is low; • All dry manure from the feedlot as well as the storage facilities should be sold and 	
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		<p>used for fertilizing purposes;</p> <ul style="list-style-type: none"> • Rehabilitate and revegetate the feedlot and storage facility areas; • Groundwater monitoring for 12months after decommissioning. 	
Climate			
Demolition works during the rainy season can cause unnecessary delays and damage to the environment, especially damage to existing roads in the area.	Medium	Should decommissioning take place in the wetter months, frequent rain could cause very wet conditions, which makes it extremely difficult to do the necessary rehabilitation works of disturbed areas. Wet soils are vulnerable to compaction. Wet conditions often causes delays and the draining of water away from the works (in the case of high water tables) into the water bodies of the adjacent properties, could (if not planned and managed correctly) have an impact on the water quality of these water bodies.	Low
Demolition works during the dry and windy season.	Low	Regular and effective damping down of working areas (especially during the dry and windy periods) must be carried out to avoid dust pollution that will have a negative impact on the surrounding environment. When necessary, these working areas should be damped down at least twice daily.	None
Fauna & Flora			
The clearing of the site and the demolishing of buildings will result in the eradication of the existing vegetation.	Medium	It is proposed that only sections to be constructed be cleared at a time to ensure that unnecessary bare soil areas are exposed.	Low

BASIC ASSESSMENT REPORT [REGULATION 22(1)]

<p>Uncontrolled fires may cause damage or loss to vegetation and fauna in the area.</p>	<p align="center">Medium</p>	<p>If fires are required for cooking and heating purposes, these fires will only be permitted in designated areas on the site. The fire area should be an exposed area (no natural veld grass should be in close proximity of the fire area).</p> <p>Workers should only be allowed to smoke in the fire area and fires should preferably be prevented while strong winds are blowing.</p>	<p align="center">None</p>
<p>Visual Impact</p>			
<p>Remnants of building structures.</p>	<p align="center">High</p>	<p>All building structures must be taken down and dispatched of accordingly.</p>	<p align="center">Medium</p>
<p>Aesthetically unpleasing.</p>	<p align="center">High</p>	<p>The decommissioning of the buildings will be aesthetically unpleasing. Building rubble must be stockpiled where it will have the least visual impact.</p>	<p align="center">Medium</p>
<p>Dumping of builder's rubble on neighbouring properties.</p>	<p align="center">Medium</p>	<p>A specific location for building rubble must be allocated on site, to concentrate and collect the building rubble and cart it to a certified landfill site. The allocated area must be out of sight of neighbouring properties to have a less visual impact.</p>	<p align="center">None</p>
<p>Veld fires may cause damage to infrastructure, vegetation and neighbouring properties.</p>	<p align="center">Medium</p>	<p>A specific area on site must be allocated, which will have the least impact on the environment and surrounding landowners, for fires of workers. This allocated area must be far from any structures and no fires may be lit except in the designated location.</p>	<p align="center">None</p>
<p>The vehicles, the site camp and other decommissioning related</p>	<p align="center">Medium</p>	<p>Before any construction work commence on site, an area on site must be</p>	<p align="center">None</p>

BASIC ASSESSMENT REPORT [REGULATION 22(1)]

facilities will have a negative visual impact during the decommissioning phase.		demarcated for a site camp.	
Localised Vibrations			
Noise pollution.	Medium	The activities related with the decommissioning phase will generate noise. Therefore, it must be restricted during working hours.	Low
Air Pollution			
Nuisance to neighbours in terms of dust generation due to demolishing of buildings.	High	The application site must be damped at a regular basis with water (more or less 3 to 4 times on a dry day). A water tanker should be used if possible.	Low
Roads & Traffic			
Heavy vehicle traffic increase could disrupt the surrounding landowners' daily routines.	Medium	Heavy vehicles must be instructed to only use the main roads during off-peak hours.	Low
Restrictions of access to surrounding properties.	Medium	<ul style="list-style-type: none"> • To minimize this impacts or risks, heavy vehicles (trucks, bull dowsers, etc.) should avoid using the local road network during peak traffic times; • These vehicles should use only specific roads and strictly keep within the speed limits and abide to all traffic laws. No speeding or reckless driving should be allowed. Access to the site for heavy vehicles should be planned to minimize the impact on the surrounding network; and • Warning signs should be erected on the roads that these vehicles will use, at big crossings/access roads and on the site if 	Low

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		needed.	
Damage to roads.	Medium	Specific roads must be allocated for the use by heavy vehicles and photos must be taken prior to decommissioning in order to determine if any damage has been done. Majority of the roads that will be used for the proposed cattle feedlot is gravel roads and therefore slow and careful driving is required by vehicles.	None
Safety & Security			
During the decommissioning phase safety and security problems (especially for the surrounding residents) are likely to occur.	Medium	Demolition works must be completed in as short time as possible. No worker or relative may reside on the site. All workers must leave the site at the end of a day's work. A security guard should be appointed on site to prevent any security problems.	Low
Decommissioning activities could cause danger to children and animals of the surrounding residents.	Medium	<ul style="list-style-type: none"> • Although regarded as a normal practice, it is important to erect proper signs indicating the operations of heavy vehicles in the vicinity of dangerous crossings and access roads or even on the site if necessary; • It is also important to indicate all areas where excavations took place/are taking place and warning signs that clearly indicate areas with excavations must be placed immediately adjacent to excavations; • A barrier should be established around dangerous excavation areas; • With the exception of the appointed security 	Low

		<p>personnel, no other workers, friend or relatives will be allowed to sleep on the site (weekends included), in the public open space or on adjacent properties; and</p> <ul style="list-style-type: none"> No workers should be allowed to enter adjacent private properties without written consent of the legal owners to the contractor. 	
Waste Management			
Site office, camp and associated waste (visual, air and soil pollution)	Medium	<ul style="list-style-type: none"> Temporary waste storage points on site shall be determined. These storage points shall be accessible by waste removal trucks; These points should not be located in areas highly visible from the properties of the surrounding land-owners/tenants/in areas where the wind direction will carry bad odours across the properties of adjacent tenants or landowners; The site camp and the rest of the area should appear neat at all times; Waste materials should be removed from the site on a regular basis, to a registered dumping site; and The site camp should not be located in a highly visual area on the site, or a screen or barrier should be erected as not have a negative impact on the sense of place. 	Low
Disposal of building waste	Medium	<ul style="list-style-type: none"> All waste generated 	Low

& liquids.		must be dumped at a pre-selected area on site to be carted to a registered landfill site. THESE AREAS SHALL BE PREDETERMINED; <ul style="list-style-type: none"> • Small lightweight waste items should be contained in skips with lids to prevent wind littering; • All waste must be removed to a recognized waste disposal site on a weekly basis. No waste materials may be disposed of on or adjacent to the site; • The storage of solid waste on site, until such time that it may be disposed of, must be in the manner acceptable to the Local Authority; and • Keep records of waste reuse, recycling and disposal for future reference. 	
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Alternative 2 – Agricultural (Site Alternative)

Potential impacts:	Significance rating of impacts:	Proposed mitigation:	Significance rating of impacts after mitigation:
Geology & Soils			
Soil erosion, siltation and gully formation.	Medium	Demolition works must be kept to a minimum on site and only be done one section at a time to prevent excessive open soil areas that could lead to soil erosion, siltation and excessive compaction.	Low
Water seepage at shallow depth could cause instability of soil or water	Medium	Geotechnical and civil engineers must supply mitigation measures and	Low

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pollution.		guidelines to prevent problems.	
Hydrology & Groundwater			
Vehicle maintenance.	Medium	Vehicle maintenance may not be done on the application site. Whenever a vehicle needs maintenance it must be taken to a certified workshop for the maintenance.	None
Excavated materials that are stockpiled in the wrong areas can interfere with the natural drainage.	Medium	An area must be allocated for stockpiling of topsoil before any demolishing of buildings take place on the site and must be situated from any water source or drainage channels. A sediment fence or barrier must be constructed around the stockpile to prevent soil from washing away by rain or any water.	Low
Surface water flows will be altered during the decommissioning phase.	Medium	Due to the demolishing that will take place (there will be trenches, topsoil and subsoil mounds in and around the area), the topography of the site will temporarily be altered.	Low
Pollution of surface water	High	<ul style="list-style-type: none"> • Decommissioning should take place during the winter months when precipitation is low; • All dry manure from the feedlot as well as the storage facilities should be sold and used for fertilizing purposes; • Rehabilitate and revegetate the feedlot and storage facility areas; • Groundwater monitoring for 12 months after decommissioning. 	Low
The possibility of groundwater pollution.	High	<ul style="list-style-type: none"> • Develop a central waste temporary 	Low

		<p>holding site to be used during decommissioning (near the access entrance). This site should comply with the following:</p> <ul style="list-style-type: none"> o Skips for the containment and disposal of all waste that could cause soil and water pollution, i.e. paint, lubricants, etc.; o Workers will only be allowed to use temporary chemical toilets on the site; o No french drain systems may be installed on site at any time; <ul style="list-style-type: none"> • No leaking vehicle shall be allowed on site. Before entering the area, all vehicles and equipment shall be inspected for leaks by a qualified mechanic/other suitably qualified person and the environmental officer. The mechanic/ the mechanic of the appointed contractor must supply the environmental officer with a letter of confirmation that the vehicles and equipment are leak proof; • If maintenance on site is absolutely necessary, it should be conducted on a concrete surface in the site camp. Spilled oil should be cleaned up and disposed off appropriately (not dumped on site). This area may not be 	
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		<p>washed with soaps and dissolvent and allowed to enter the drainage system;</p> <ul style="list-style-type: none"> • Decommissioning should take place during the winter months when precipitation is low; • All dry manure from the feedlot as well as the storage facilities should be sold and used for fertilizing purposes; • Rehabilitate and revegetate the feedlot and storage facility areas; • Groundwater monitoring for 12months after decommissioning. 	
Climate			
<p>Demolition works during the rainy season can cause unnecessary delays and damage to the environment, especially damage to existing roads in the area.</p>	Medium	<p>Should decommissioning take place in the wetter months, frequent rain could cause very wet conditions, which makes it extremely difficult to do the necessary rehabilitation works of disturbed areas. Wet soils are vulnerable to compaction. Wet conditions often causes delays and the draining of water away from the works (in the case of high water tables) into the water bodies of the adjacent properties, could (if not planned and managed correctly) have an impact on the water quality of these water bodies.</p>	Low
<p>Demolition works during the dry and windy season.</p>	Low	<p>Regular and effective damping down of working areas (especially during the dry and windy periods) must be carried out to avoid dust pollution that will have a negative impact on the surrounding</p>	None

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		environment. When necessary, these working areas should be damped down at least twice daily.	
Fauna & Flora			
The clearing of the site and the demolishing of buildings will result in the eradication of the existing vegetation.	Medium	It is proposed that only sections to be constructed be cleared at a time to ensure that unnecessary bare soil areas are exposed.	Low
Uncontrolled fires may cause damage or loss to vegetation and fauna in the area.	Medium	<p>If fires are required for cooking and heating purposes, these fires will only be permitted in designated areas on the site. The fire area should be an exposed area (no natural veld grass should be in close proximity of the fire area).</p> <p>Workers should only be allowed to smoke in the fire area and fires should preferably be prevented while strong winds are blowing.</p>	None
Visual Impact			
Remnants of building structures.	High	All building structures must be taken down and dispatched accordingly.	Medium
Aesthetically unpleasing.	High	The decommissioning of the buildings will be aesthetically unpleasing. Building rubble must be stockpiled where it will have the least visual impact.	Medium
Dumping of builder's rubble on neighbouring properties.	Medium	A specific location for building rubble must be allocated on site, to concentrate and collect the building rubble and cart it to a certified landfill site. The allocated area must be out of sight of neighbouring properties to have a less visual impact.	None
Veld fires may cause	Medium	A specific area on site must	None

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damage to infrastructure, vegetation and neighbouring properties.		be allocated, which will have the least impact on the environment and surrounding landowners, for fires of workers. This allocated area must be far from any structures and no fires may be lit except in the designated location.	
The vehicles, the site camp and other decommissioning related facilities will have a negative visual impact during the decommissioning phase.	Medium	Before any construction work commence on site, an area on site must be demarcated for a site camp.	None
Localised Vibrations			
Noise pollution.	Medium	The activities related with the decommissioning phase will generate noise. Therefore, it must be restricted during working hours.	Low
Air Pollution			
Nuisance to neighbours in terms of dust generation due to demolishing of buildings.	High	The application site must be damped at a regular basis with water (more or less 3 to 4 times on a dry day). A water tanker should be used if possible.	Low
Roads & Traffic			
Heavy vehicle traffic increase could disrupt the surrounding landowners' daily routines.	Medium	Heavy vehicles must be instructed to only use the main roads during off-peak hours.	Low
Restrictions of access to surrounding properties.	Medium	<ul style="list-style-type: none"> To minimize this impacts or risks, heavy vehicles (trucks, bulldozers, etc.) should avoid using the local road network during peak traffic times; These vehicles should use only specific roads and strictly keep within the speed limits and abide to all traffic laws. No speeding or reckless driving should be allowed. Access to 	Low

		<p>the site for heavy vehicles should be planned to minimize the impact on the surrounding network; and</p> <ul style="list-style-type: none"> Warning signs should be erected on the roads that these vehicles will use, at big crossings/access roads and on the site if needed. 	
Damage to roads.	Medium	<p>Specific roads must be allocated for the use by heavy vehicles and photos must be taken prior to decommissioning in order to determine if any damage has been done. Majority of the roads that will be used for the proposed cattle feedlot is gravel roads and therefore slow and careful driving is required by vehicles.</p>	None
Safety & Security			
<p>During the decommissioning phase safety and security problems (especially for the surrounding residents) are likely to occur.</p>	Medium	<p>Demolition works must be completed in as short time as possible. No worker or relative may reside on the site. All workers must leave the site at the end of a day's work. A security guard should be appointed on site to prevent any security problems.</p>	Low
<p>Decommissioning activities could cause danger to children and animals of the surrounding residents.</p>	Medium	<ul style="list-style-type: none"> Although regarded as a normal practice, it is important to erect proper signs indicating the operations of heavy vehicles in the vicinity of dangerous crossings and access roads or even on the site if necessary; It is also important to indicate all areas where excavations took place/are taking place and warning 	Low

		<p>signs that clearly indicate areas with excavations must be placed immediately adjacent to excavations;</p> <ul style="list-style-type: none"> • A barrier should be established around dangerous excavation areas; • With the exception of the appointed security personnel, no other workers, friend or relatives will be allowed to sleep on the site (weekends included), in the public open space or on adjacent properties; and • No workers should be allowed to enter adjacent private properties without written consent of the legal owners to the contractor. 	
Waste Management			
<p>Site office, camp and associated waste (visual, air and soil pollution)</p>	Medium	<ul style="list-style-type: none"> • Temporary waste storage points on site shall be determined. These storage points shall be accessible by waste removal trucks; • These points should not be located in areas highly visible from the properties of the surrounding land-owners/tenants/in areas where the wind direction will carry bad odours across the properties of adjacent tenants or landowners; • The site camp and the rest of the area should appear neat at all times; • Waste materials should be removed from the site on a regular basis, to a 	Low

		<p>registered dumping site; and</p> <ul style="list-style-type: none"> The site camp should not be located in a highly visual area on the site, or a screen or barrier should be erected as not have a negative impact on the sense of place. 	
<p>Disposal of building waste & liquids.</p>	<p align="center">Medium</p>	<ul style="list-style-type: none"> All waste generated must be dumped at a pre-selected area on site to be carted to a registered landfill site. THESE AREAS SHALL BE PREDETERMINED; Small lightweight waste items should be contained in skips with lids to prevent wind littering; All waste must be removed to a recognized waste disposal site on a weekly basis. No waste materials may be disposed of on or adjacent to the site; The storage of solid waste on site, until such time that it may be disposed of, must be in the manner acceptable to the Local Authority; and Keep records of waste reuse, recycling and disposal for future reference. 	<p align="center">Low</p>

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

- Ecological Fauna Habitat Survey (Appendix G1)**
- Wetland Assessment (Appendix G2)**
- Vegetation Assessment Report (Appendix G3)**
- Geohydrological Investigation (G4)**

4. CUMULATIVE IMPACTS

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

Should the proposed development be approved, the cumulative impacts will be related to the construction and operational phase.

Cumulative impacts for the construction phase include:

- Noise pollution may upset residents in the area – to prevent this, construction activities may only take place during the daytime;
- Surface water flows will be altered during the construction phase of the proposed development – a storm water management plan must therefore be implemented;
- Dust pollution could cause nuisance to surrounding residents – dust can be effectively controlled through the wetting of exposed surfaces, especially in the winter months.

Subsequently, the above mentioned cumulative impacts can be mitigated if activities are correctly planned and measures are implemented to manage activities which could cause any negative cumulative impacts. The size of the development, in terms of infrastructure and facilities, is relative small and the equipment and vehicles required for construction not that many.

Cumulative impacts for the operational phase include:

- Surface and ground water pollution – effluent runoff from the feedlot, runoff from manure dams and the use of chemicals (medicine and pesticides). These impacts can be mitigated by using registered products and channelling the surface water runoff to manure or retention dams in lined/concrete channels;
- Air pollution through dust and odours – the feedlot pad should be kept moist (not wet) to suppress dust and lower the odour nuisance.

One has to note, that the greatest cumulative impact on the site would be if no agricultural development take place. If no development takes

place, an area zoned for agriculture will not be utilised for agricultural purposes. Currently the alien and invasive species on site will degrade the natural system surrounding the proposed development area. It is therefore recommended that the proposed development is allowed to take place. With development, the alien invasive species will be eradicated and job opportunities will open up.

5. ENVIRONMENTAL IMPACT STATEMENT

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

Alternative 1 (Proposal)

The major impacts that is likely to occur during the construction and operational phase:

- **Natural Environment**

The Natural environment will be temporarily affected by the moving of construction vehicles and the construction of the cattle feedlot.

Valuable topsoil may also be lost during the construction process. The loss of topsoil can however be minimised through the storage of topsoil in designated stockpiles on site and the re-use thereof within the landscape component of the development.

The generation of dust will be evident during the construction and operational phases of the proposed cattle feedlot but the distance from neighbouring residences is enough not to have an excessive impact.

The pollution of surface and ground water are likely to occur through the runoff of effluent from the feedlot, runoff from manure dams and the use of chemicals (medicine and pesticides). These impacts can be mitigated by using registered products and channelling the surface water runoff to manure or retention dams in lined/concrete channels.

▪ **The Social Environment**

The Public Participation were done by means of a newspaper notice, site notices placed on prominent points on the application site, hand delivered notices to surrounding tenants and landowners and the distributing of notices to stakeholders such as the Local Authorities, Councillors by means of faxes and e-mails.

Dangerous excavations can cause injury/ even death to people if proper precautions are not taken. Crime can also impact the surrounding community from the temporary workers.

Job opportunities will increase with the proposed development during the construction and operational activities.

▪ **Economic Environment**

The proposed development will create a number of employment opportunities for individuals in the surrounding area;

The proposed Cattle Feedlot will have a positive impact on the Agricultural community as the production of good quality meat will be promoted.

▪ **Noise**

The construction phase will cause noise pollution and disturb the receiving community, but can be mitigated with the limitation construction hours from 8:00 to 18:00 to cause minimal disturbance to the community.

▪ **Visual**

Construction vehicles and equipment can be visually unpleasant for residents. Furthermore the proposed development should be designed to be aesthetically pleasing and blend in with the adjacent neighbouring properties.

Alternative 2

The establishment of an Agricultural Development, a cattle feedlot, on a different portion of the larger farm area will be less feasible than the proposed Alternative 1 due to the site access, and associated roads, being situated further away than that of Alternative 1.

Considering all the infrastructure and roads associated with the proposed developments it will be necessary to clear a lot more natural vegetation and additionally the dust will be more than Alternative 1 as the gravel road used by trucks and vehicles (construction and operational phase) will be a lot longer than the existing access road to the site of Alternative 1.

In light of the above mentioned it is clear that Alternative 1, Agricultural Development on the proposed site, will be more acceptable and feasible than the alternative site.

No-go (compulsory)

The no-go option entails that the development area stay in the current state.

The majority of the site is dominated by alien and invasive plant species. Presently no sensitive features such as ridges, wetlands, nor any protected fauna and flora species are present on site.

No positive impacts are foreseen for the no-go alternative as the study area will stay in its current state. Presently, the application site is not seen as a pristine natural environment due to previous agricultural activities, possibly cultivation.

If the proposed development would not continue and the no-go option is pursued it will prevent positive socio-economic activities in terms of job creation and investment opportunities from occurring. If no development takes place, an area zoned for agriculture will not be utilised for agricultural purposes, which seems ineffective.

In this instance, it is however not recommended that the No-Go option be followed as there will be no job opportunities for residents in the surrounding area during both the construction and operational phase. There will also be no contribution to food security in South Africa. If no development takes place, it is highly likely that alien and invasive plant species will dominate even more. The construction of the proposed development would provide for some short-term impacts on the Bio-physical environments of the study area as well as the immediate surrounding urban environment, but can however in this instance be mitigated to an acceptable level. In the long term, the proposed development would have a positive impact on the Socio-economic environment of the study area as well as its surroundings, due to that it will promote and contribute towards positive economic growth and contribute to the food security in South Africa.

6. IMPACT SUMMARY OF PREFERRED PROPOSAL

Identify preferred proposal

Alternative 1 (Proposal)

Having assessed the significance of impacts of the proposal and various alternatives, please provide an overall summary and reasons for selecting the preferred project proposal.

It's evident that based on the biophysical and socio-economic characteristics, the site is suitable for the proposed development (only if the project is planned and managed in accordance with an approved Environmental Management Plan). The development will fit in with the surrounding area and create numerous job opportunities during the constructional and operational phases.

As already indicated, most of the construction related activities could be mitigated to an acceptable level. Furthermore no detrimental ecological impacts are anticipated.

If the proposed development is managed according to a standard theme and finishing are proposed for the development it will sufficiently address the potential or possible visual impacts of the development on the receiving environment. If designed with the surrounding environment in mind, it will enhance the "Sense of Place" and overall character of the area

The proposed development will create several job opportunities during the construction phase and will also promote job opportunities during the operational phase. The proposed development is supported by several national, local and government policies, frameworks and documents.

No Cultural/Historically significant areas were identified on the application site and thus no areas of historical or cultural value will be affected.

If managed correctly, the proposed project could (mainly in the long term) have a significant positive impact on the social and economical environments. The proposed development could also have a positive impact on the ecological environment (the removal of exotic invaders and weeds from the study area).

Furthermore, from the findings of this Basic Assessment the following can be concluded:

- The proposed development will fit in with the surrounding land uses and the general character of the area, and will add some diversity to land-uses of the area. Therefore, the proposed development is in line with the policies and legislation and highly compatible with the present and future land uses in the area;
- The mitigations and adaptive monitoring outlined in this Basic Assessment and the EMP with respect to potential adverse impacts should result in limited adverse impacts on local and regional, natural and socio-economic resources. Balanced with the overall beneficial positive economic and environmental impacts identified, the potential net adverse effects attributable to the proposed development do not constitute a threat to local and regional ecological resources and social systems; and
- No “fatal flaws” or adverse impacts that cannot be mitigated are anticipated to be associated with the proposed cattle feedlot.

As a result of the above mentioned information, Bokamoso is of the opinion that the proposed development (only if planned, implemented and managed correctly) will in the long term have a significant positive impact on the larger regional system to which it is linked. The

development will also (mainly in the long and medium term) have a significant positive impact on the social and economical environments (on a local, regional and provincial scale).

It is therefore requested that the development of the proposed cattle feedlot be allowed to proceed, so long as the mitigation measures contained in this report and in the Environmental Management Plan (**Annexure H**) are implemented, so as to achieve maximum advantage from beneficial impacts, and sufficient mitigation of adverse impacts.

7. RECOMMENDATION OF PRACTITIONER

Is the information contained in this report and the documentation attached hereto sufficient to make a decision in respect of the activity applied for (in the view of the Environmental Assessment Practitioner).

YES	NO
X	

If "NO", indicate the aspects that should be assessed further as part of a Scoping and EIA process before a decision can be made (list the aspects that require further assessment):

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

As a result of the above mentioned information, Bokamoso request that the above development be approved as long as the following are followed:

- The mitigation measures in the EMP attached must be adhered to at all times and the appointed ECO must ensure the developer comply with the EMP;
- Recommendation and mitigation measures in the specialist reports should be adhered to at all times;
- Mitigation measures of the Geohydrological Investigation should be incorporated into the management plans and adhered to.
- Storm water management on site should aim for fast and efficient disposal of water into the surrounding and existing drainage systems away from the wetlands. It is the responsibility of the applicant to ensure that storm water entering the surrounding drainage systems is not contaminated by spilled chemicals;
- Aliens and invasive plant species should be eradicated and managed on the study area according to the Conservation of Agricultural Resources Act (Act no. 43 of 1983) and Section 28 of the National Environmental Management Act, 1998. The Invasive

species control plan should be implemented at least every 3 months after completion of the activity.

8. ENVIRONMENTAL MANAGEMENT PLAN (EMP)

If the EAP answers yes to Point 7 above then an EMP is to be attached to this report as an Appendix

EMP attached

YES
X

SECTION F: APPENDIXES

The following appendixes must be attached as appropriate:

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

Appendix A: Site plan(s)

Appendix B: Photographs

Appendix C: Facility illustration(s)

Appendix D: Route position information

Appendix E: Public participation information

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

Appendix G: Specialist reports

Appendix H: EMP

Appendix I: Other information

Site plan(s)



Appendix A

GENERAL NOTES:

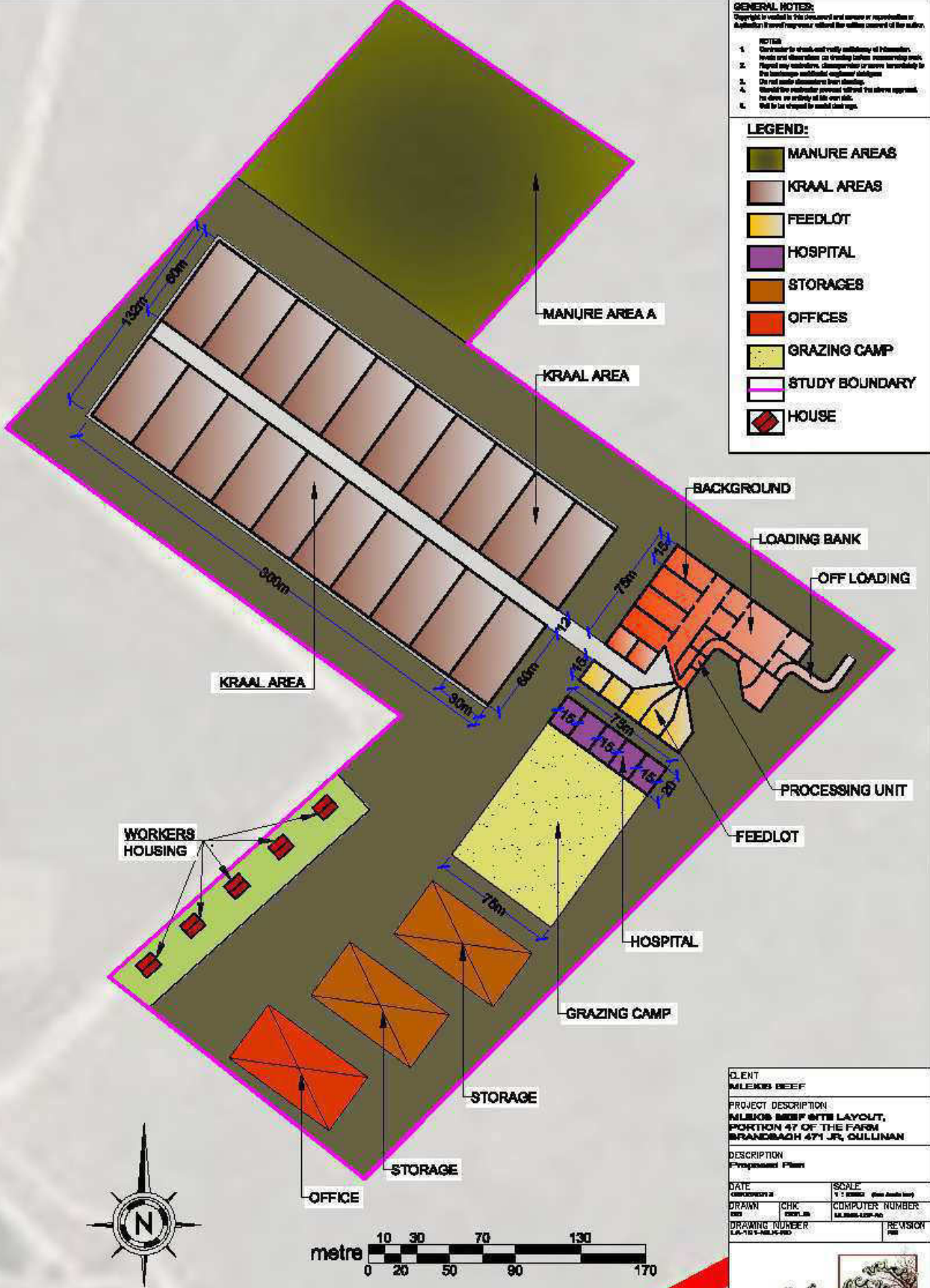
Copyright is vested in this document and no part or reproduction or adaptation thereof may be made without the written consent of the author.

NOTES:

1. Contractor to check and verify suitability of dimensions, levels and elevations on drawing before commencing work.
2. Report any variations, discrepancies or errors immediately to the landscape architectural engineer/ architect.
3. Do not make alterations from drawing.
4. Should the contractor proceed without the above approval, he does so entirely at his own risk.
5. Will be to be stamped in each stage.

LEGEND:

- MANURE AREAS
- KRAAL AREAS
- FEEDLOT
- HOSPITAL
- STORAGES
- OFFICES
- GRAZING CAMP
- STUDY BOUNDARY
- HOUSE



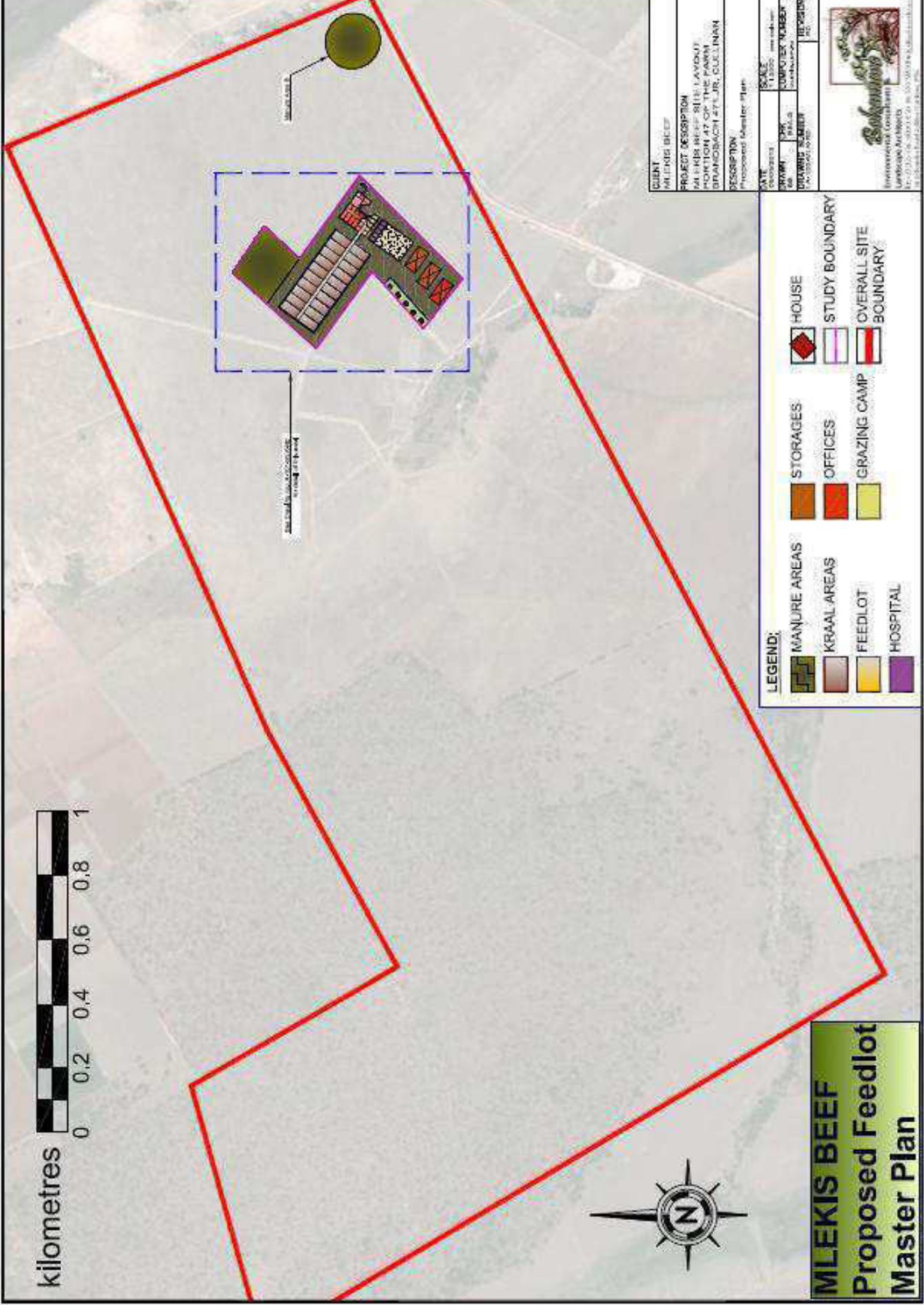
CLIENT MLEKIS BEEF			
PROJECT DESCRIPTION MLEKIS BEEF SITE LAYOUT, PORTION 47 OF THE FARM BRANDBACH 471 JR, GULLINAN			
DESCRIPTION Proposed Plans			
DATE 02/03/2012	SCALE 1 : 5000 (from Aerial Imagery)		
DRAWN EAS	CHK EAS	COMPUTER NUMBER LA-101-MLK-B-00	REVISION 001
DRAWING NUMBER LA-101-MLK-B-00			



MLEKIS BEEF - Proposed Feedlot Layout



MLEKIS BEEF
Proposed Feedlot
Master Plan



Overall site boundary

Study boundary

House boundary

LEGEND:

	MANURE AREAS		STORAGES		HOUSE
	KRAAL AREAS		OFFICES		STUDY BOUNDARY
	FEEDLOT		GRAZING CAMP		OVERALL SITE BOUNDARY
	HOSPITAL				

CLIENT	M L EKIS BEEF
PROJECT DESCRIPTION	ML EKIS BEEF SITE LAYOUT LOCATION AT GLEN THE PLOOM BRANDSBURG FARM, CULLINAN
DESCRIPTION	Proposed Master Plan
DATE	2014
DRAWN BY	ML EKIS BEEF
CHECKED BY	ML EKIS BEEF
SCALE	1:1000
DRAWING NUMBER	ML EKIS BEEF
SUBJECT NUMBER	ML EKIS BEEF
REVISION	ML EKIS BEEF



Photographs







**Facility Illustration(s)
(Not available)**

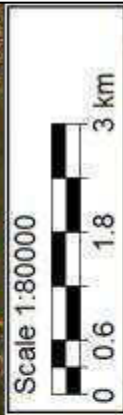


Appendix C

Route Position Information



Appendix D



Legend

- Highways
 - unclassified
 - secondary
 - primary
- Route numbers
 - secondary
- Place names
- Towns (levels)
 - +
 - 5
 - (imported shp) mtlelekt plan

R568 Ekondastala Pad

Malansput

Wassijesput

Wassijesalo

Ekondastala

Duff City

Ekondastala

R973

Surrounding Sites

Public Participation Information



Appendix E

Proof of Site Notice



Appendix E1

NOTICE OF APPLICATION FOR ENVIRONMENTAL AUTHORISATION (EA)

Notice is given of an application for Environmental Authorisation (EA) that was submitted to the Gauteng Department of Agriculture and Rural Development, in terms of Regulation No. R543 published in the Government Notice No. 33306 of 18 June 2010 of the National Environment Management Act, 1998 (Act No. 107 of 1998) governing **Basic Assessment Procedures (Listing Notice: 1 – Governing Notice R544)** for the following activity:

Reference No: Gaut: 002/12-13/E0222

Project Name: Proposed Cattle Feedlot with manure storage and composting facility on Part of Portion 47 of the farm Brandbach 471 JR, Cullinan

Property Description: Part of Portion 47 of the farm Brandbach 471 JR, Cullinan

Proposed Zoning Information: Agricultural

Listing Activities Applied for:

GNR 544 (Listing Notice 1), 18 June 2010	Activity 4
GNR 544 (Listing Notice 1), 18 June 2010	Activity 9
GNR 544 (Listing Notice 1), 18 June 2010	Activity 22
GNR 544 (Listing Notice 1), 18 June 2010	Activity 23

Proponent Name: Mlekis Beef

Location: The proposed Cattle Feedlot is to be established on Part of Portion 47 of the Farm Brandbach 471 JR. The Farm is located north of the R875, approximately 10km north-east of Cullinan. The study area is furthermore located immediately west of the Gauteng/Mpumalanga Provincial Boarder, and subsequently falls within the local jurisdiction of the City of Tshwane Metropolitan Municipality, Gauteng Province.

Date of Notice: 5 February 2013

Queries regarding this matter should be referred to:

Bokamoso Landscape Architects and Environmental Consultants

Public Participation registration and inquiries: **Juanita De Beer**

Project Inquiries: **Niel Brink**

P.O. Box 11375

Maroelana 0161

www.bokamoso.net

Tel: (012) 346 3810

Fax: (086) 570 5659

E-mail: lizelleg@mweb.co.za

In order to ensure that you are identified as an Interested and/or Affected Party (I&AP) please submit your name, contact information and interest in the matter, in writing, to the contact person given above **within 40 days of this Notice.**



**Written Notices Issued to Those Persons
Detailed in 1(b) to 1(f) above**



Appendix E2

Proposed Cattle Feedlot on Part of Portion 47 of the farm Brandbach 471 JR, Cullinan

NOTICE OF APPLICATION FOR ENVIRONMENTAL AUTHORISATION (EA)

Notice is given of an application for Environmental Authorisation (EA) that was submitted to the Gauteng Department of Agriculture and Rural Development, in terms of Regulation No. R543 published in the Government Notice No. 33306 of 18 June 2010 of the National Environment Management Act, 1998 (Act No. 107 of 1998) governing Basic Assessment Procedures (Notice 1 – Governing Notice R544) for the following activity:

Reference No: Gaut: 002/12-13/EO222

Project Name: Proposed Cattle Feedlot with manure storage and composting facility on Part of Portion 47 of the farm Brandbach 471 JR, Cullinan

Property Description: Part of Portion 47 of the farm Brandbach 471 JR, Cullinan

Proposed Zoning Information: Agricultural

Proponent Name: Mlekis Beef

Listed Activities Applied: GNR 544 (Listing Notice 1) – Activity 4, 9, 22 & 23

Location: The proposed Cattle Feedlot is to be established on Part of Portion 47 of the Farm Brandbach 471 JR. The Farm is located north of the R875, approximately 10km north-east of Cullinan. The study area is furthermore located immediately west of the Gauteng/Mpumalanga Provincial Border, and subsequently falls within the local jurisdiction of the City of Tshwane Metropolitan Municipality, Gauteng Province.

Date of Notice: 5 February 2013

Queries regarding this matter should be referred to:

Bokamoso Landscape Architects and Environmental Consultants
Public Participation registration and inquiries: **Juanita De Beer**

Project inquiries: **Niel Brink**

P.O. Box 11375

Maroelana 0161

www.bokamoso.net

Tel: (012) 346 3810

Fax: (086) 570 5659

E-mail: lizelle@mweb.co.za

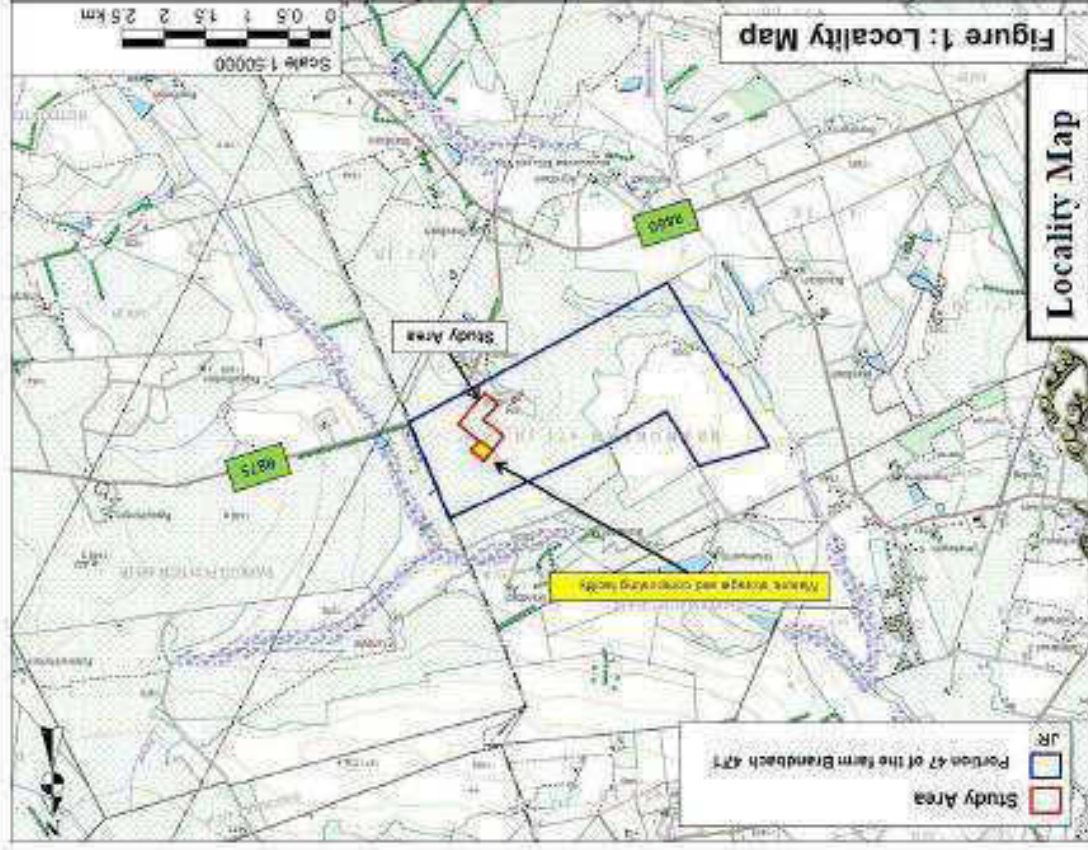


Figure 1: Locality Map

Locality Map

In order to ensure that you are identified as an interested and/or Affected Party (I&AP) please submit your name, contact information and interest in the matter, in writing, to the contact person given above within 40 days of this Notice.

LIST OF REGISTERED LETTERS

Lys van GEREGISTREERDE BRIEWE

(With an insurance option/met 'n versekeringsopsie)



Full tracking and tracing/Volledige volg en spoor

Name and address of sender
 Naam en adres van afsender: Bobamase PO Box 11375,
Marcelona 0161
Waltloo + Mleki Beef

Enquiries/Navrae
 Toll-free number
 Tollvry nommer
0800 111 502

No	Name and address of addressee Naam en adres van geadresseerde	Insured amount Versekerde bedrag	Insurance fee Versekeringsgeld	Postage Posgeld	Service fee Diensgeld	Affix Track and Trace customer copy Plak Volg-en-Spoor-kliëntafskrif
1	Papkuilfontein Boerdery Postbus 73943 Lynnwoodrif, 0040					REGISTERED LETTER REGISTERED LETTER StarCall 0800 111 502 www.sagp.co.za RD 605 074 797 ZA
2	Johanna Sussana Malan P.O. Box 163, Cullinan, 1000					CUSTOMER COPY 301028R REGISTERED LETTER StarCall 0800 111 502 www.sagp.co.za RD 605 074 770 ZA
3	Dietrich Carl Otto van Staden P.O. Box 150, Cullinan, 1000					CUSTOMER COPY 301028R REGISTERED LETTER StarCall 0800 111 502 www.sagp.co.za RD 605 074 766 ZA
4	Jacobus Lourens Jordaan P.O. Box 1050, Cullinan, 1000					CUSTOMER COPY 301028R REGISTERED LETTER StarCall 0800 111 502 www.sagp.co.za RD 605 074 749 ZA
5	Big Cedar Trading, 134 Private Bag X22, Brooklyn Square, 0075					CUSTOMER COPY 301028R REGISTERED LETTER StarCall 0800 111 502 www.sagp.co.za RD 605 074 752 ZA
6						
7						
8						
9						
10						

Number of letters posted
 Getal briewe gepos: 5/ Five Total Totaal: R R R R

Signature of client
 Handtekening van kliënt: JolBeer

Signature of accepting officer
 Handtekening van aanneembeampte: [Signature]

The value of the contents of these letters is as indicated and compensation is not payable for a letter received unconditionally. Compensation is limited to R100,00. No compensation is payable without documentary proof. Optional insurance of up to R2 000,00 is available and applies to domestic registered letters only.

Die waarde van die inhoud van hierdie briewe is soos aangedui en vergoeding sal nie betaal word vir 'n brief wat sonder voorbehoud ontvang word nie. Vergoeding is beperk tot R100,00. Geen vergoeding is sonder dokumentêre bewys betaalbaar nie. Opsionele versekering van tot R2 000,00 is beskikbaar en is slegs op binne landse geregistreerde briewe van toepassing.





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CIPC Company Report

windeed
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SEARCH DETAILS

Date Requested Reference 2013/02/04 15:17

COMPANY SUMMARY

Name: PAKKUILFONTEIN BOERDERY
Status: In Business
Registration Number: 2005/014706/07
Registration Date: 2005/05/13

DIRECTOR LIST (4)

FERREIRA, PIERRE (Director - Active)
VAN ZYL, PIETER JOHANNES WILLEM (Director - Active)
BOTHA, JACOBUS LODEWIEKUS (Director - Resigned)
OELEOFSE, JOHANNES NARTHINUS (Director - Resigned)

AUDITOR(S) LIST (2)

NORTHPLAN CHARTERED ACCOUNTANTS
BUYS DE BEER JONCK INGELYF

COMPANY INFORMATION

Registration No	2005/014706/07	Registered Office	P/A BUYS DE BEER JONCK INGELYF 1STE VLOER OOS BLOK MENLYN SQUARE H/V LOISLAAN EN GOBIESTRAAT MENLYN, PRETORIA 0181
Status	In Business		
Enterprise Name	PAKKUILFONTEIN BOERDERY		
Registration Date	2005/05/13		
Enterprise Type	Private Company		
Conv. Enterprise No		Postal Address	POSBUS 73943 LYNNWOODRIF
Business Start	2005/05/13		
Old Reg No		Region	0040 Gauteng
Financial Year End	2	Country	Unknown
Fin Effective Date	2005/05/13	Country of Origin	
Tax Number	9525574159	CK Date	-
Short Name		CK Date Received	-
Translated Name		Date of Type	2005/05/13
Status Date	-	Issued Shares	100
Authorized Shares	1000	Issued Capital	100
Authorized Capital	1000		
Industry	Other business activities		

DIRECTOR(S)**FERREIRA, PIERRE (Director)**

ID Number/Passport Number	6304105070080	Initials	P
Date of Birth	1963/04/10	Member size percentage	0
Status	Active	Member Contribution	0
Resignation Date	-	Residential Address	RIBBONLAAN 712 LITTLE FALLS 1735
Country of Residence	South Africa	Postal Address	RIBBONLAAN 712 LITTLE FALLS 1735
Telephone Number		e-mail Address	
Fax Number		Profession	
Cell Number		Appointment	2009/12/06

VAN ZYL, PIETER JOHANNES WILLEM (Director)

ID Number/Passport Number	6108115166089	Initials	P J W
Date of Birth	1961/08/11	Member size percentage	0
Status	Active	Member Contribution	0
Resignation Date	-	Residential Address	JOCHUMSTRAAT 69 WATERKLOOF LANDBOUHOEWES PRETORIA 0001
Country of Residence	South Africa	Postal Address	PARKSTRAAT 3A KEMPTON PARK 1620
Telephone Number		e-mail Address	
Fax Number		Profession	TAND TEGNIKUS
Cell Number		Appointment	2005/11/04

BOTHA, JACOBUS LODEWIEKUS (Director)

ID Number/Passport Number	6408045022083	Initials	J L
Date of Birth	1964/08/04	Member size percentage	0
Status	Resigned	Member Contribution	0
Resignation Date	2009/12/05	Residential Address	GEDEELTE 21 VAN GEDEELTE 5V BRANDBACH 471 JR CULLINAN 1000
Country of Residence	South Africa	Postal Address	POSBUS 348 BRONKHORSTSPRUIT 1020
Telephone Number		e-mail Address	
Fax Number		Profession	ONDERWYSER
Cell Number		Appointment	2005/11/04

OELEOFSE, JOHANNES NARTHINUS (Director)

ID Number/Passport Number	7802125003089	Initials	J N
Date of Birth	1978/02/12	Member size percentage	0
Status	Resigned	Member Contribution	0
Resignation Date	-	Residential Address	509 POWELL STREET PRETORIA GARDENS 0082
Country of Residence	South Africa	Postal Address	P O BOX 48444 HERCULES 0030
Telephone Number		e-mail Address	
Fax Number		Profession	BUSINESSMAN
Cell Number		Appointment	2005/05/13

AUDITOR(S)**NORTHPLAN CHARTERED ACCOUNTANTS**

Name	NORTHPLAN CHARTERED ACCOUNTANTS	Status	Resign
Prof. Code	Chartered Accounts	Type	Auditor
Prof. No		Postal Address	P O BOX 3000 HOUGHTON
Start Date	-		
End Date	2005/11/04		2041
Expiry Date	-		
Reg. Entry Date	-		
CM31 Completed	-	Physical Address	KILLARNEY MALL OFFICE TOWER OFFICE 209 60 RIVIERA ROAD KILLARNEY 2193
CM31 Received	-		
Ref. No			
Fine Letter			
Date of status change (if applicable)	-	Act Ind Mpy No Sp	

BUYS DE BEER JONCK INGELYF

Name	BUYS DE BEER JONCK INGELYF	Status	Current
Prof. Code	Chartered Accounts	Type	Auditor
Prof. No	906905A	Postal Address	POSBUS 73943 LYNNWOODRIF 0040
Start Date	2005/11/04		
End Date	-		
Expiry Date	-		
Reg. Entry Date	2005/11/04		
CM31 Completed	2005/11/04	Physical Address	1STE VLOER OOS BLOK MENLYN SQUARE H/V LOISLAAN EN GOBIESTRAAT MENLYN PRETORIA 0181
CM31 Received	2005/11/04		
Ref. No			
Fine Letter			
Date of status change (if applicable)	-	Act Ind Mpy No Sp	

CAPITAL INFORMATION

Type	No of Shares	Parri Value	Cap. Amount	Cap. Premium
Authorized Ordinary	1000	0	1	0
Authorized Ordinary	100	0	1	0

HISTORY

Eff. Date	Change Type
2005/11/04	Auditor/Acc Officer Change (NORTHPLAN CHARTERED ACCOUNTANTS Reported Material Irregularity on : Status : Resign)
2005/11/04	Auditor/Acc Officer Change (POSBUS 73943 LYNNWOODRIF 0040 Status : Address Change)
2005/11/04	Directors/Member Change/Secretary/Trust/Both Dir And Office (Surname=OELOFSE Full ForeNames=JOHANNES NARTHINUS Id No=7802125003089 Status :RESIGNED Nature of Change=BEDANK)
2005/11/04	Directors/Member Change/Secretary/Trust/Both Dir And Office (Surname=VAN ZYL Full ForeNames=PIETER JOHANNES WILLEM Id No=6108115166089 Status :ACTIVENature of Change=AANSTELLING)
2005/11/04	Directors/Member Change/Secretary/Trust/Both Dir And Office (Surname=BOTHA Full ForeNames=JACOBUS LODEWIEKUS Id No=6408045022083 Status :ACTIVENature of Change=AANSTELLING)
2005/11/08	Name Change (Q TIQUE 51)
2005/11/08	Nature of Business Change (SIC Code) (62)

HISTORY

2005/11/25	Registered Address Change (P/A BUYS DE BEER JONCK INGELYF 1STE VLOER OOS BLOK MENLYN SQUARE H/V LOISLAAN EN GOBIESTRAAT MENLYN, PRETORIA 0181)
2005/11/25	Postal Address Change (POSBUS 73943 LYNNWOODRIF 0040)
2008/05/14	Auditor/Acc Officer Change (Change Record Name: = BUYS DE BEER JONCK INGELYF Status: = Current)
2008/05/14	Directors/Member Change/Secretary/Trust/Both Dir And Office (Change Record Surname: = BOTHA First Names: = JACOBUS LODEWIEKUS Status: = Active)
2008/05/14	Directors/Member Change/Secretary/Trust/Both Dir And Office (Change Record Surname: = VAN ZYL First Names: = PIETER JOHANNES WILLEM Status: = Active)
2009/11/26	Directors/Member Change/Secretary/Trust/Both Dir And Office (Change Record Surname = BOTHA First Names = JACOBUS LODEWIEKUS Status = Resigned)
2009/11/26	Directors/Member Change/Secretary/Trust/Both Dir And Office (Add Record Surname = FERREIRA First Names = PIERRE Status = Active)
2009/11/26	Directors/Member Change/Secretary/Trust/Both Dir And Office (Change Record Surname = VAN ZYL First Names = PIETER JOHANNES WILLEM Status = Active)
2011/07/09	Cancellation of Deregistration Process (Annual Return Non Compliance - Cancellation of Deregistration)

DISCLAIMER

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Contact Information



MALAN, JOHANNA SUSSANA

GENERAL INFORMATION

Date Requested 2013/02/04 15:15
Reference -

PERSON INFORMATION

Surname MALAN
Forename(s) JOHANNA SUSSANA
Date of Birth 1932/08/17
ID Number(s) 3208170010082

CONTACT INFORMATION

Phone (home) Not specified
Phone (work) Not available
Mobile Number Not available
Residential Address BRANDBACH 471 (143), CULLINAN, 1000
(Last updated: 2006/09/21)
Postal Address P O BOX 163, CULLINAN, 1000
(Last updated: 2006/09/21)

DISCLAIMER

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Contact Information

VON STADEN, DIETRICH CARL OTTO

GENERAL INFORMATION

Date Requested 2013/02/04 15:12
Reference -

PERSON INFORMATION

Surname VON STADEN
Forename(s) DIETRICH CARL OTTO
Date of Birth 1949/08/30
ID Number(s) 4908305119083

CONTACT INFORMATION

Phone (home) 0127361114
 (Last updated: 2006/08/13)

Phone (work) Not available

Mobile Number Not available

Residential Address 14 PLOT ROAD, BRANDBACH 471JR, CULLINAN, CULLINAN, 1000
 (Last updated: 2009/04/13)

Postal Address P O BOX 150, CULLINAN, 1000
 (Last updated: 2009/04/13)

DISCLAIMER

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Contact Information

JORDAAN, JACOBUS LOURENS

GENERAL INFORMATION

Date Requested 2013/02/04 15:11
Reference -

PERSON INFORMATION

Surname JORDAAN
Forename(s) JACOBUS LOURENS
Date of Birth 1964/04/02
ID Number(s) 6404025012087

CONTACT INFORMATION

Phone (home) 0127340603
(Last updated: 2009/04/29)

Phone (work) 0136933626
(Last updated: 2008/12/05)

Mobile Number 0823753841
(Last updated: 2010/04/05)

Residential Address P BUS 1050, CULLINAN, CULLINAN, 1000
(Last updated: 2009/01/01)

Postal Address P O BOX 1050, CULLINAN, 1000
(Last updated: 2009/01/01)

DISCLAIMER

This report contains information gathered from our suppliers and we do not make any representations about the accuracy of the data displayed nor do we accept responsibility for inaccurate data. WinDeed will not be liable for any damage caused by reliance on this report. This report is subject to the terms and conditions of the [WinDeed End User Licence Agreement \(EULA\)](#).



Companies and Intellectual
Property Commission

a member of the dti group

CIPC Company Report

windeed
information is our business

SEARCH DETAILS

Date Requested 2013/02/04 15:05
Reference -

COMPANY SUMMARY

Name BIG CEDAR TRADING 134
Status In Business
Registration Number 2003/010927/07
Registration Date 2003/05/15

DIRECTOR LIST (3)

CHITSUNGE, KUDZAI BRYLYNE (Director - Active)
GOUWS, CHRISTIAN (Director - Resigned)
MORKEL, BAREND JAKOBUS (Director - Resigned)

AUDITOR(S) LIST (6)

RSM BETTY & DICKSON (TSHWANE)
RSM ASSOCIATES-PRETORIA
MALHERBE LOURENS
BEYER OUDITEURE
RSM ASSOCIATES PRETORIA
RSM BETTY & DICKSON (TSHWANE)

COMPANY INFORMATION

Registration No	2003/010927/07	Registered Office	SUITE 1 267 WATERKLOOF ROAD BROOKLYN 0181
Status	In Business		
Enterprise Name	BIG CEDAR TRADING 134		
Registration Date	2003/05/15		
Enterprise Type	Private Company		
Conv. Enterprise No		Postal Address	PRIVATE BAG X22 BROOKLYN SQUARE 0075
Business Start	2003/05/15	Region	Gauteng
Old Reg No		Country	Unknown
Financial Year End	2	Country of Origin	
Fin Effective Date	2003/05/15	CK Date	-
Tax Number	9222504152	CK Date Received	-
Short Name		Date of Type	2003/05/15
Translated Name		Issued Shares	100
Status Date	-	Issued Capital	100
Authorized Shares	1000		
Authorized Capital	1000		
Industry	Invalid SIC code: 62		

DIRECTOR(S)**CHITSUNGE, KUDZAI BRYLYNE (Director)**

ID Number/Passport Number	6903021288088	Initials	
Date of Birth	1969/03/02	Member size percentage	0
Status	Active	Member Contribution	0
Resignation Date	-	Residential Address	567 LA QUINTA STREET SILVERLAKES PRETORIA EAST 0081
Country of Residence	South Africa	Postal Address	567 LA QUINTA STREET SILVERLAKES PRETORIA EAST 0081
Telephone Number		e-mail Address	
Fax Number		Profession	DIRECTOR
Cell Number		Appointment	2010/08/11

GOUWS, CHRISTIAN (Director)

ID Number/Passport Number	5908285147087	Initials	C
Date of Birth	1959/08/28	Member size percentage	0
Status	Resigned	Member Contribution	0
Resignation Date	2003/05/15	Residential Address	329 ANCHELLA STREET FAERIE GLEN 0043
Country of Residence	South Africa	Postal Address	P O BOX 35465 MENLO PARK 0102
Telephone Number		e-mail Address	
Fax Number		Profession	ATTORNEY
Cell Number		Appointment	2003/05/15

MORKEL, BAREND JAKOBUS (Director)

ID Number/Passport Number	5809015050007	Initials	B J
Date of Birth	1958/09/01	Member size percentage	0
Status	Resigned	Member Contribution	0
Resignation Date	2010/08/11	Residential Address	158 ZAMBEZI AVE SINOVILLE 0182
Country of Residence	South Africa	Postal Address	POSBUS 15627 SINOVILLE 0129
Telephone Number		e-mail Address	
Fax Number		Profession	BESIGHEIDSMAN
Cell Number		Appointment	2003/05/15

AUDITOR(S)**RSM BETTY & DICKSON (TSHWANE)**

Name	RSM BETTY & DICKSON (TSHWANE)	Status	Current
Prof. Code	Chartered Accounts	Type	Auditor
Prof. No	901520A	Postal Address	PRIVATE BAG X22 BROOKLYN SQUARE
Start Date	2006/03/01		
End Date	-		0075
Expiry Date	-		
Reg. Entry Date	2006/09/27		
CM31 Completed	2006/09/27	Physical Address	SUITE 1 267 WATERKLOOF ROAD BROOKLYN
CM31 Received	2006/09/27		
Ref. No			0181
Fine Letter			
Date of status change (if applicable)	-	Act Ind Mpy No Sp	

RSM ASSOCIATES-PRETORIA

Name	RSM ASSOCIATES-PRETORIA	Status	Name Change
Prof. Code	Chartered Accounts	Type	Auditor
Prof. No	901520A	Postal Address	PO BOX 3476 PRETORIA
Start Date	-		
End Date	2006/03/01		0001
Expiry Date	-		
Reg. Entry Date	-		
CM31 Completed	-	Physical Address	SUITE 1 267 WATERKLOOF ROAD BROOKLYN
CM31 Received	-		
Ref. No			0181
Fine Letter			
Date of status change (if applicable)	-	Act Ind Mpy No Sp	

MALHERBE LOURENS

Name	MALHERBE LOURENS	Status	Resign
Prof. Code	Chartered Accounts	Type	Auditor
Prof. No		Postal Address	P O BOX 4590 RANDBURG
Start Date	-		
End Date	-		2125
Expiry Date	-		
Reg. Entry Date	-		
CM31 Completed	-	Physical Address	326 RIVONIA BOULEVARD RIVONIA
CM31 Received	-		
Ref. No			2128
Fine Letter			
Date of status change (if applicable)	-	Act Ind Mpy No Sp	

BEYER OUDITEURE

Name	BEYER OUDITEURE	Status	Resign
Prof. Code	Chartered Accounts	Type	Auditor
Prof. No		Postal Address	POSBUS 15627 SINOVILLE PRETORIA
Start Date	-		
End Date	2005/11/17		0129
Expiry Date	-		
Reg. Entry Date	-		
CM31 Completed	-	Physical Address	ZAMBEZI RYLAAN 158 SINOVILLE PRETORIA
CM31 Received	-		
Ref. No			0182
Fine Letter			
Date of status change (if applicable)	-	Act Ind Mpy No Sp	

RSM ASSOCIATES PRETORIA

Name	RSM ASSOCIATES PRETORIA	Status	Name Change
Prof. Code	Chartered Accounts	Type	Auditor
Prof. No	901520A	Postal Address	PO BOX 3476 PRETORIA
Start Date	2005/11/17		
End Date	2006/03/01		0001
Expiry Date	-		
Reg. Entry Date	2005/11/17		
CM31 Completed	2005/11/17	Physical Address	SUITE 1 267 WATERKLOOF ROAD BROOKLYN PRETORIA
CM31 Received	2005/11/17		0181
Ref. No			
Fine Letter			
Date of status change (if applicable)	-	Act Ind Mpy No Sp	

RSM BETTY & DICKSON (TSHWANE)

Name	RSM BETTY & DICKSON (TSHWANE)	Status	Resign
Prof. Code	Chartered Accounts	Type	Auditor
Prof. No	901520A	Postal Address	PRIVATE BAG X22 BROOKLYN SQUARE 0075
Start Date	2006/03/01		
End Date	2006/03/01		
Expiry Date	-		
Reg. Entry Date	2006/07/04		
CM31 Completed	2006/07/04	Physical Address	SUITE 1 267 WATERKLOOF ROAD BROOKLYN PRETORIA
CM31 Received	2006/07/04		0181
Ref. No			
Fine Letter			
Date of status change (if applicable)	-	Act Ind Mpy No Sp	

CAPITAL INFORMATION

Type	No of Shares	Parri Value	Cap. Amount	Cap. Premium
Authorized Ordinary	1000	0	1	0

Authorized Ordinary	100	0	1	0
---------------------	-----	---	---	---

HISTORY

Eff. Date	Change Type
2003/06/02	Directors/Member Change/Secretary/Trust/Both Dir And Office (Change Record Surname = GOUWS First Names = CHRISTIAN Status = Resigned)
2003/06/02	Auditor/Acc Officer Change (Add Record Name = BEYER OUDITEURE Status = Current)
2003/06/02	Auditor/Acc Officer Change (Change Record Name = MALHERBE LOURENS Status = Resign)
2003/06/02	Directors/Member Change/Secretary/Trust/Both Dir And Office (Add Record Surname = MORKEL First Names = BAREND JAKOBUS Status = Active)
2003/06/22	Postal Address Change (P O BOX 35465 MENLO PARK 0102)
2003/06/22	Registered Address Change (287 LYNNWOOD ROAD MENLO PARK 0081)
2004/08/17	Auditor/Acc Officer Change (Change Record Name = MALHERBE LOURENS Status = Resign)
2004/08/17	Auditor/Acc Officer Change (Add Record Name = RSM ASSOCIATES-PRETORIA Status = Current)
2004/11/10	Postal Address Change (POSBUS 15627 SINOVILLE PRETORIA 0129)
2004/11/10	Registered Address Change (ZAMBEZI RYLAAN 158 SINOVILLE PRETORIA 0182)
2005/11/17	Auditor/Acc Officer Change (PO BOX 3476 PRETORIA 0001 Status Address Change)
2005/11/17	Auditor/Acc Officer Change (BEYER OUDITEUREReported Material Irregularity on Status Resign)
2006/03/01	Auditor/Acc Officer Change (RSM ASSOCIATES PRETORIASUITE 1 267 WATERKLOOF ROAD BROOKLYN PRETORIA 0181 PRIVATE BAG X22 BROOKLYN SQUARE 0075 Status Name Change)
2006/03/01	Auditor/Acc Officer Change (RSM BETTY & DICKSON (TSHWANE)SUITE 1 267 WATERKLOOF ROAD BROOKLYN PRETORIA 0181 PRIVATE BAG X22 BROOKLYN SQUARE 0075 Status Current)
2006/03/01	Auditor/Acc Officer Change (RSM ASSOCIATES-PRETORIASUITE 1 267 WATERKLOOF ROAD BROOKLYN 0181 PRIVATE BAG X22 BROOKLYN SQUARE 0075 Status Name Change)
2006/03/01	Auditor/Acc Officer Change (RSM BETTY & DICKSON (TSHWANE)SUITE 1 267 WATERKLOOF ROAD BROOKLYN 0181 PRIVATE BAG X22 BROOKLYN SQUARE 0075 Status Current)
2006/03/01	Auditor/Acc Officer Change (RSM BETTY & DICKSON (TSHWANE) Reported Material Irregularity on 1 March 2006 Status Resign)
2006/07/25	Postal Address Change (PRIVATE BAG X22 BROOKLYN SQUARE 0075)
2006/07/25	Registered Address Change (SUITE 1 267 WATERKLOOF ROAD BROOKLYN 0181)
2006/09/27	Directors/Member Change/Secretary/Trust/Both Dir And Office (Surname=MORKEL Full ForeNames=BAREND JAKOBUS Id No=5809015050080 Status ACTIVENature of Change=CHANGE OF ADDRESSES)
2008/06/24	Directors/Member Change/Secretary/Trust/Both Dir And Office (Surname=MORKEL Full ForeNames=BAREND JAKOBUS Id No=5809015050080 Status ACTIVENature of Change=NO CHANGE)
2010/08/11	Directors/Member Change/Secretary/Trust/Both Dir And Office (Surname=MORKEL Full ForeNames=BAREND JAKOBUS Id No=5809015050080 Status RESIGNEDNature of Change=DIRECTOR RESIGNED)
2010/08/11	Directors/Member Change/Secretary/Trust/Both Dir And Office (Surname=CHITSUNGE Full ForeNames=KUDZAI BRYLYNE Id No=6903021288088 Status ACTIVENature of Change=APPOINTED)
2011/07/09	Cancellation of Deregistration Process (Annual Return Non Compliance - Cancellation of Deregistration)

DISCLAIMER

This report contains information gathered from our suppliers and we do not make any representations about the accuracy of the data displayed nor do we accept responsibility for inaccurate data. WinDeed will not be liable for any damage caused by reliance on this report. This report is subject to the terms and conditions of the [WinDeed End User Licence Agreement \(EULA\)](#)

Proof of Newspaper Advertisement



Appendix E3

**EIN IQ45, KRUGERSDORP
KRUGERSOORP
DORPSBEPLANNINGSKEMA, 1980
PLAASLIKE MUNISIPALITEIT**
 (1) Mikro-vervaardiger (2)
 ertifikaat
 3 Klousule 14(a) van die Krugers-
 lanningskema, 1980 beskied ken-
 at ek / ons, die ondergetekende(s)
 ns is om aansoek te doen by die
 laaslike Munisipaliteit om
 vir die volgende: (1) Mikro-
 volgens die Drankwet 9,2003; (2)
 rtifikaat volgens die Gesondheids-
 918 van 30 Julie 1999, om
 dukte voor te berei en te verkoop
 e/ plaas gedeelte: Gedeelte 20,
 ewes /plaas Koesterfontein IQ45,
 Besonderhede van die aansoek is
 ns gewone kantoorure by: 10
 Weltevreden Park X9, Roodepoort.
 enige beswaar het teen die goed-
 ierdie aansoek, moet sodanige be-
 e met die gronde daarvoor, skrifte-
 Munisipale Bestuurder, Mogale
 Munisipaliteit asook by die onder-
 voring op: 6 Maart 2013.
 Living Waters Trust
 jikant: P O Box 624, Welobie, 1714
TEIN FEB 5,12(JJK)185

**631R, GED 239 & REST VAN
 STON DORPPLANNINGSKEMA, 1985
 9 EN DIE RESTANT VAN GEDEELTE
 EIN 63-IR, EKURHULENI METRO-
 MUNISIPALITEIT EKURHULENI
 AANSE MUNISIPALITEIT STIGTING
 EK VAN VERMAAKLIHEID VIR VYF
 E LUTBETAAL DOBBELMASJIENE**
 Germiston Dorpsbeplanningskema,
 iermee bekend gemaak dat ons on-
 van voornemens is om by die Ekur-
 politaanse Munisipaliteit (Germis-
 te doen toestemming tot die daarin
 Plek van Vermaakliheid vir vyf
 lutbetaal dobbelmasjiene op: (A)
 9 (N GEDEELTE VAN GEDEELTE 43)
 AS RIETFONTEIN 63-IR, GELEë AAN
 KRAFTWEG (FONTANA BETAU-
 3) DIE RESTANT VAN GEDEELTE 41
 AS RIETFONTEIN 63-IR, GELEë AAN
 AMBER EN KRAFTWEG (ELANDSTON-
 V). Besonderhede van hierdie aan-
 urende gewone werksure by
 10) op die 2de vloer, Germiston
 gsentrum, Ekurhuleni Metro-
 isipaliteit, Nr. 15 Queenstraat, Ger-
 spekteer word. Enigemand wat be-
 nteken teen die goedkeuring van
 ek moet skriftelik aan die Uitvoer-
 eur: Stedelikeontwikkeling, Ekur-
 isipaliteit, Municipaliteit, Doebuc



**BRANDBACH 471 JR, PART OF PTN 47
 NOTICE OF APPLICATION FOR ENVIRONMENTAL
 AUTHORISATION (EA)**

Notice is given of an application for Environmental Authorisation (EA) that was submitted to the Gauteng Department of Agriculture and Rural Development, in terms of Regulation No. R543 published in the Government Notice No. 33306 of 18 June 2010 of the National Environment Management Act, 1998 (Act No. 107 of 1998) governing Basic Assessment Procedures (Listing Notice: 1 - Governing Notice R544) for the following activity: Reference No: Gaut: 002/12-13/E0222. Project Name: Proposed Cattle Feedlot with manure storage and composting facility on Part of Portion 47 of the farm Brandbach 471 JR, Cullinan. Property Description: Part of Portion 47 of the farm Brandbach 471 JR, Cullinan. Proposed Zoning Information: Agricultural. Listing Activities Applied for: GNR 544 (Listing Notice 1), 18 June 2010 - Activity 4, 9, 22 & 23. Proponent Name: Mlekis Beef. Location: The proposed Cattle Feedlot is to be established on Part of Portion 47 of the Farm Brandbach 471 JR. The Farm is located north of the R875, approximately 10km north-east of Cullinan. The study area is furthermore located immediately west of the Gauteng/Mpumalanga Provincial Boarder, and subsequently falls within the local jurisdiction of the City of Tshwane Metropolitan Municipality, Gauteng Province. Date of Notice: 5 February 2013. Queries regarding this matter should be referred to: Bokamoso Landscape Architects and Environmental Consultants. Public Participation registration and inquiries: Juanita De Beer, Project Inquiries: Niel Brink; P.O. Box 11375; Maroelana 0161; Tel: (012) 346 3810; Fax: (086) 570 5659; E-mail: lizelleg@mweb.co.za; www.bokamoso.net. In order to ensure that you are identified as an Interested and/or Affected Party (I&AP) please submit your name, contact information and interest in the matter, in writing, to the contact person given above within 40 days of this Notice. 002/12-13/E0222 FEB 5(B)186

Eksekusieverk



**MIBCO/TRIPLE-E - MOTORS
 NOTICE OF SALE IN E
 IN THE LABOUR COURT OF SOUT
 AT BRAAMFONTEIN Case Numbe
 In the case between: MIBCO EXE
 CREDITOR and TRIPLE-E - MOT
 DEBTOR
 PURSUANT to an award granted
 Resolution Council of the Motor
 duly certified by a commissioner,
 terms of Section 143 of the Labo
 Act, Act 66 of 1995 the under m
 will be sold at 11H00 on 19 FEB
 public auction to be held at c/o
 STREET, EDENVALE, GERMISTO
 Sheriff for the High Court, GERN
 to the highest bidder for cash, n
 2 X OFFICE DESK, 4 X STEEL FIL
 1 X COMPLETE DESKTOP COMPI
 1 X WOODEN STATIONARY CAB
 PRINTER, 3 X CAR LIFTERS (JAC
 COMPUTER WHEEL BALANCER,
 WORKING TABLE, 1 X MAC AFR
 SOR. SIGNED at PRETORIA in 20
 SHERIFF OF THE COURT
 (sgd) CHRISTO LINGENFELDER
 ATTORNEYS FOR EXECUTION OF
 LINGENFELDER BALOYI ATTORN
 ATTERBURY ESTATE, BUILDING
 DE BEER STREET, MENLYN, PRE
 Tel: 012 348 8424 Fax: 012 348
 Ref: C LINGENFELDER/VB File N
 MH0995/MIBCO/T28233 FEB 5(LB)**

Verkoop van B

**Communications to and from Persons
Detailed in Point 2 and 3 above**



Appendix E4

Mary-Lee

From: User3 [user3@bokamoso.net]
Sent: 05 February 2013 04:22 PM
To: jgrobler@geoscience.org.za; asalomon@sahra.org.za; 'maphata.ramphele@gauteng.gov.za'; 'justicem@dwaf.gov.za'; 'siwelanel@dwa.gov.za'; 'tshifaror@dwa.gov.za'; 'central@eskom.co.za'; 'paia@eskom.co.za'; 'schmidk@nra.co.za'; 'kumen.govender@gauteng.gov.za'; 'customerservice@randwater.co.za'; 'RudzaniM@tshwane.gov.za'; 'daniel.ramokone@transnet.net'; 'casperm@tshwane.gov.za'; 'bruna.haipe@absamail.co.za'; 'alwyn@sabroking.co.za'
Cc: ncube.nali@gmail.com
Subject: Interested and/or Affected Party Member - Mleki Beef
Attachments: Public Notice BA.pdf; Public Notice Waste Management.pdf

Dear Interested and/or Affected Party Member,

Please refer to the attached Public Notices regarding the proposed *Cattle Feedlot with manure storage and composting facility on Part of Portion 47 of the farm Brandbach 471 JR, Cullinan* Project.

Hope this finds you well.

Kind Regards

Juanita De Beer



**Landscape Architects &
Environmental Consultants**

T: (+27)12 346 3810 | F: (+27) 86 570 5659 | E: lizelleq@mweb.co.za | www.bokamoso.net
36 Lebombo Street, Ashlea Gardens, Pretoria | P.O. Box 11375 Maroelana 0161

LEBOMBO GARDENS BUILDING
36 LEBOMBO ROAD
ASHLEA GARDENS
0081

P.O. BOX 11375
MAROELANA
0181

Tel: (012) 346 3810
Fax: 086 570 5659
E-mail: lizellog@mweb.co.za
Website: www.Bokamoso.net



Landscape Architects, Environmental Consultants,
Environmental Auditing, Water License Applications

Acknowledgement of Receipt

Department of Water Affairs
Bothongo Plaza East
285 Schoeman Street
Pretoria

ATTENTION: Mr. T.L. Mathebe

1 August 2013

**RE: DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED CATTLE FEEDLOT
ON PART OF PORTION 47 OF THE FARM BRANDBACH 471 JR, CULLINAN
(GAUT: 002/12-13/E0222)**

Please find herewith 1 x hard copy and 1 x electronic copy of the Draft Basic Assessment Report for the abovementioned project.

By Hand

Name and Surname: Dikeledi Murideli
(Receiver)

Date: 01-08-2013

Where: Reception (DWA)

Signature: [Handwritten Signature]

Sender: Mary-Lee Potgieter

LEBOMBO GARDENS BUILDING
36 LEBOMBO ROAD
ASHLEA GARDENS
0081

P.O. BOX 11375
MAROELANA
0161

Tel: (012) 346 3810
Fax: 086 570 5659
E-mail: lizelleg@mweb.co.za
Website: www.Bokamoso.biz



Landscape Architects, Environmental Consultants,
Environmental Auditing, Water License Applications

Acknowledgement of Receipt

City of Tshwane
Open Space Management Section
Nr. 11 Schoeman Street
Pretoria

012-358 8871

ATTENTION: Rudzani Mukhell

1 August 2013

**RE: DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED CATTLE FEEDLOT
ON PART OF PORTION 47 OF THE FARM BRANDBACH 471 JR, CULLINAN
(GAUT: 002/12-13/E0222)**

Please find herewith 1 x hard copy and 3 x electronic copies of the Draft Basic Assessment Report for the abovementioned project.

By Hand

Name and Surname : Ntokoza Xaba
(Receiver)

Date: 01/08/2013

Where: City of Tshwane

Signature: [Signature]

Sender: Mary-Lee Potgieter

LEBOMBO GARDENS BUILDING
36 LEBOMBO ROAD
ASHILEA GARDENS
0081

P.O. BOX 11375
MAROELANA
0161

Tel: (012) 346 3810
Fax: 086 570 5659
E-mail: lizelleg@miweb.co.za
Website: www.Bokamoso.biz



Landscape Architects, Environmental Consultants,
Environmental Auditing, Water License Applications

Acknowledgement of Receipt

Gauteng Department of Agriculture
and Rural Development
Admin Unit 2nd Floor
68 Diamond Corner Building
Cnr Eloff and Market Street
Johannesburg
2000

Courier/Client Instructions

RECIPIENT TO SIGN
THE ENCLOSED INVOICE

ATTENTION: Justine Chan/Boniswa Belot

1 August 2013

**RE: DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED CATTLE FEEDLOT
ON PART OF PORTION 47 OF THE FARM BRANDBACH 471 JR, CULLINAN
(GAUT: 002/12-13/E0222)**

Please find herewith 2 x electronic copies of the Draft Basic
Report for the abovementioned project.

By Courier

Name and Surname :
(Receiver)

Date:

Where:

Signature:

Sender:

Mary-Lee Potgieter

Stamp: GAUTENG DEPARTMENT OF AGRICULTURE AND RURAL DEVELOPMENT
Handwritten: 30 August 2013
Date: 5/08/2013
Where: Reception
Signature: [Handwritten Signature]

**PLEASE
COLLECT ON
DELIVERY**

Mary-Lee

From: Mary-Lee [user2@bokamoso.net]
Sent: 11 September 2013 08:43 AM
To: 'mathebet@dwa.gov.za'
Subject: Cattle Feedlot (Gaut: 002/12-13/E0222)
Attachments: SKMBT_C36013091108410.pdf

Good Morning,

Please find the letter attached regarding the above mentioned project. The review period ended on 10 September 2013 for the Draft BAR and therefore the review time have been extended until 18 September 2013.

Kind Regards,

Mary-Lee Potgieter



**Landscape Architects &
Environmental Consultants cc**

T: (+27)12 346 3810 | F: (+27) 86 570 5659 | E: lizelleg@mweb.co.za | www.bokamoso.biz
36 Lebombo Street, Ashlea Gardens, Pretoria | P.O. Box 11375 Maroelana 0161

Please consider the environment before printing this email

LEBOMBO GARDENS BUILDING
36 LEBOMBO ROAD
ASHLEA GARDENS
0081

P.O. BOX 11375
MAROELANA
0161

Tel: (012) 346 3810
Fax: 086 870 5659
E-mail: lize@eg@mweb.co.za
Website: www.Bokamoso.biz

Bokamoso
ENVIRONMENTAL

Landscape Architects, Environmental Consultants,
Environmental Auditing, Water License Applications

**Department of Water Affairs
Bothongo Plaza East
285 Schoeman Street
Pretoria**

ATTENTION: Mr. T.L. Mathebe

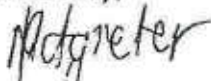
11 September 2013

**RE: DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED CATTLE FEEDLOT
ON PART OF PORTION 47 OF THE FARM BRANDBACH 471 JR, CULLINAN
(GAUT: 002/12-13/E0222)**

The Draft Basic Assessment Report for the above mentioned project was submitted to your department on 1 August 2013 for review. The review period ended on 10 September 2013 and no comments have been submitted to our office. Extended review time will be allowed for comments until 18 September 2013.

Hope you find the above in order. Please do not hesitate to contact our office should you have any questions in this regard.

Sincerely,



Mary-Lee Potgieter
**Bokamoso Landscape Architects &
Environmental Consultants CC**

**Minutes of Any Public and/or
Stakeholders Meetings
(Not available)**



Appendix E5

Comments and Responses Report



Appendix E6

**COMMENT AND RESPONSE REPORT-
BASIC ASSESSMENT REPORT FOR THE PROPOSED ESTABLISHMENT OF CATTLE FEEDLOT
ON PART OF PORTION 47 OF THE FARM BRANDBACH 471 JR, CULLINAN
Gaut: 002/12-13/E0222**

Issue	Commentator	Date	Response
<p>In reviewing the application the Department made the following findings:</p> <p>a) Erosion control measures should be implemented to prevent loss of existing and remaining topsoil on site.</p> <p>b) The proposed development and functioning of the activity must comply with the Occupational Health and Safety Standards as set out in the Occupational Health and Safety Act no. 85 of 1993 at all times.</p> <p>c) Storm water management on site should aim the fast and efficient disposal of water into the surrounding and existing drainage systems away from the wetlands. It is the responsibility of the applicant to ensure that storm water entering the surrounding drainage systems is not contaminated by spilled chemicals.</p> <p>d) All waste generated during the construction should be removed and disposed to a registered landfill site. No dumping may take place within the open spaces surrounding the study area. Such activity will lead to the recovery of costs from the contractor.</p> <p>e) All the recommendations and mitigation measures in the report and specialist studies in the attached appendices must be adhered to during the construction and operational phase of the development.</p> <p>f) Aliens and invasive plant species should be eradicated and managed on the study area according to the Conservation of</p>	<p>Mr Livhuwani Siphuma City of Tshwane</p>	<p>16/10/2013</p>	<p>a) Erosion control measures will be implemented on the site.</p> <p>b) The proposed development should comply with the Occupational Health and Safety Standards as set out in the Occupational Health and Safety Act no. 85 of 1993.</p> <p>c) It will be recommended that this is a condition of the ROD.</p> <p>d) Proper waste management measures forms part of the EMP.</p> <p>e) This should be made a condition of the ROD.</p> <p>f) This should be made a condition of the ROD and it is included in the Final EMP.</p>

<p>Agricultural Resources Act (Act no. 43 of 1983) and Section 28 of the National Environmental Management Act, 1998. The Invasive species control plan should be implemented at least every 3 months after completion of the activity and should be included within the final approved EMP. All areas disturbed as part of the proposed activity will be deemed as the study area.</p> <p>g) The wetland located outside the site is of high priority and can somehow be indirectly affected or influenced by the proposed development, therefore cleaning of the feedlot and waste management should be part of the operational plan to avoid the ripple effect of the proposed activity on the adjacent wetland.</p> <p>h) The activities on site must comply with the Tshwane Municipality's By-Laws.</p>			<p>g) In the Final EMP, mitigation measures are listed for the operational phase of the proposed development to ensure that pollution of the adjacent wetland does not occur.</p> <p>h) Noted.</p>
---	--	--	--

**Comments from I&Ap's on
Basic Assessment (BA) Report**



Appendix E7



Environmental Management Department

4th Floor, Nr 11 Schoeman Street, Pretoria
PO Box 1454 | Pretoria | 0001
Tel: 012 358 8871 | Fax: 012 358 8934
Email: LivhuwaniS@tshwane.gov.za | www.tshwane.gov.za

My ref:	8/4/R/5	Tel:	012 358 8731
Your ref:	GAUT: 002/12-13/E0222	Fax:	012 358 8934
Contact person:	N. Nemudivhiso	Email:	NdanduleniN@Tshwane.gov.za
Section:	Environmental Planning and Open Space Management Section	Date:	16 October 2013

Bokamoso Landscape Architects & Environmental Consultants CC
P.O. Box 11375
Marcelana
0161

Attention: Ms. Mary-Lee Potgieter
Tel: 012 346 3810
Fax: 086 570 5659
Email: lizeileg@mweb.co.za

Dear Madam,

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED ESTABLISHMENT OF CATTLE FEEDLOT ON PART OF PORTION 47 OF THE FARM BRANDBACH 471 JR, CULLINAN

Your Report dated 01 August 2013 refers,

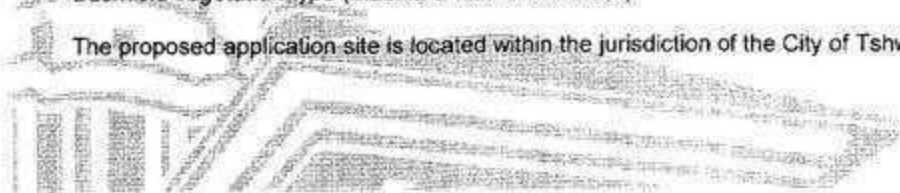
1. INTRODUCTION

The Agriculture and Environmental Management Department (the Department) has considered the Draft Basic Assessment Report dated 01 August 2013 in respect of the above-mentioned application. The Draft Basic Assessment Report is submitted to the Environmental Management Division of the City of Tshwane, hereafter referred to as 'the City', as a commenting authority as required in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) and the Environmental Impact Assessment Regulations, June 2010.

2. PROJECT LOCATION AND DESCRIPTION

Bokamoso Landscape Architects & Environmental Consulting has been appointed by City of Tshwane as an independent Environmental Assessment Practitioner EPA to undertake the environmental assessment for the proposed development for the establishment of a cattle feedlot on part of portion 47 of the farm Brandbach 471 JR, Cullinan. The study area is 13 km east-north-east of Cullinan in the Gauteng Province. It is situated at the Savanna Biome which is represented by the Central Sandy Bushveld vegetation type (Mucina & Rutherford 2006)

The proposed application site is located within the jurisdiction of the City of Tshwane Municipality.



The activity entails undertaking the following listed activity in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) and the Environmental Impact Assessment Regulations, 2010.

R544

Listing Notice 1 (Activity 4): The construction of facilities or infrastructure for the concentration of animals for the purpose of commercial production in densities that exceed-

- 20 square metres per large stock unit and more than 500 units per facility
 - 8 square metres per small stock unit and;
- a. More than 1000 units per facility excluding pigs where (b) will apply;
- b. More than 250 pigs per facility excluding piglets that are not yet weaned;

Listing Notice 1 (Activity 9): The construction of facilities or infrastructure exceeding 1000m in length for the bulk transportation of water, sewage or stormwater –

- i. with an internal diameter of 0,36m or more; or
- ii. with a peak throughput of 120 l per second or more.

Excluding where;

- a) Such facilities or infrastructure are for bulk transportation of water, sewage or stormwater drainage inside a road reserve; or
- b) Where such construction will occur within urban areas but further than 32m from a watercourse, measured from the edge of the watercourse.

Listing Notice 1 (Activity 22): The construction of a road outside urban areas,

- i. With a reserve wider than 13,5 meters or,
- ii. Where no reserve exists where the road is wider than 8 metres, or
- iii. For which an environmental authorization was obtained for the route determination in terms of activity 5 in Government Notice 387 of 2006 or activity 18 in Notice 545 of 2010.

Listing Notice 1 (Activity 23): The transformation of undeveloped, vacant or derelict land to –

- i. Residential, retail, commercial, recreational, industrial or institutional use, inside an urban area. And where the total area to be transformed is 5 hectares or more, but less than 20 hectares, or
- ii. Residential, retail, commercial, recreational, industrial or institutional use, outside an urban area and where the total area to be transformed is bigger than 1 hectare but less than 20 hectares;-

Except where such transformation takes place for linear activities.

3. KEY FACTORS INFORMING THE COMMENTS

In making its comments in respect of the proposed activity the Department has taken, inter alia, the following into consideration:

- a) The information contained in the Final Basic Assessment Report compiled by Bokamoso Landscape Architects and Environmental Consultants dated 01 August 2013 and received by the department on 21 August 2013
- b) Information obtained from the Departments' s information base including *inter alia*:
 - Geographic Information System (GIS data),
 - Gauteng Open Space Plan (GOSP).
- c) Compliance with applicable Municipal, provincial and national policies and guidelines including:

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- The National Environmental Management Act 1998 (Act 107 of 1998) (NEMA): its decision-making principles and Environmental Impact Assessment Regulations;
- The Tshwane Integrated Environmental Policy (TIEP);
- The City Development Strategy; and
- The Tshwane Open Space Framework (TOSF) Policy Statements and Typologies.

4. DISCUSSION

In reviewing the application the Department made the following findings:

- According to the Bioregional Plan for the Gauteng Metropolitan Municipalities the proposed site is situated within the following areas:
 - **Critical Biodiversity Area 1 & 2:** Any terrestrial or aquatic area required to meet biodiversity pattern and/or process thresholds. These include any area that is required for meeting pattern thresholds, namely remaining areas of Critically Endangered vegetation types and areas required to protect threatened species; any area that is required for meeting process thresholds such as areas important for climate change adaptation; and hydrological process areas such as high priority wetlands and catchments, pan clusters and pans within priority catchments. In addition to the above areas where there is little or no choice of area identified, CBAs include all 'best design' sites in terms of meeting pattern and process thresholds, identified by the iterative conservation planning process. 'Best design' refers to an identified network of natural sites that meet pattern and process thresholds in all vegetation types and features in a spatially efficient and ecologically robust way, and aim to avoid conflict with other activities (e.g. economic activity) where it is possible to achieve biodiversity thresholds elsewhere.
 - **Ecological Support Areas 1 & 2:** Supporting zone required to prevent degradation of Critical Biodiversity Areas and Protected Areas. These include remaining corridor, catchment, wetland and other process areas that are required to prevent degradation of Critical Biodiversity Areas and formal Protected Areas; and areas which would otherwise have been identified as Critical Biodiversity Areas except that have been transformed or degraded, but which are currently or potentially still important for supporting ecological processes e.g. floodplain areas that have transformed or degraded. These areas are a focus for rehabilitation rather than the intensification of land uses.
 - **Other Natural Area;** and
 - **No Natural Remaining.**
- According to the Report the study area is situated within the Nokeng Agricultural Hub, which is one of the seven agricultural hubs identified in Gauteng. The proposal is therefore considered to be in line with the GAPA's objectives.
- The report indicated that the surrounding land uses is mainly agriculture and therefore the proposed activity is in line with the land use zoning.
- The report indicated that the proposed area for the cattle feedlot is ideal for this purpose as it is a flat plain with a slight slope which is good for manure runoff management.
- The report indicated that the site will need the minimum construction of roads as it is close to the existing access to the farm.
- The ecological faunal habitat survey report indicated that the study area is situated at the savanna biome which is represented by the Central Sandy Bushveld type (Mucina & Rutherford 2006).

- g) The report also indicated that the site has been cultivated and consists of grassland with a conspicuous concentration of low ecological status grass species and exotic weeds.
- h) The report indicated that there would be no threat to any threatened species or any other species of particular conservation concern at the site for the proposed footprint.
- i) The wetland assessment report indicated that a watercourse is present at the south western part of the site which is defined as a small non-perennial tributary.
- j) The report also indicated that there are wetlands situated outside the site which can be indirectly affected by the proposed development if precautionary measures are not taken.
- k) The report indicated that there is no river or wetland occurring on the study area, therefore the area is not affected by any floodlines.
- l) The report indicated that the site does not fall within an irreplaceable area and neither does it fall on a ridge or in a buffer zone of any ridge.
- m) The report also indicated that there were no obvious features, sites or artefacts of cultural significance found on the site.

5. RECOMMENDATIONS

In reviewing the application the Department made the following findings:


- a) Erosion control measures should be implemented to prevent loss of existing and remaining topsoil on site.
- b) The proposed development and functioning of the activity must comply with the Occupational Health and Safety Standards as set out in the Occupational Health and safety Act no. 85 of 1993 at all times.
- c) Storm water management on site should aim the fast and efficient disposal of water into the surrounding and existing drainage systems away from the wetlands. It is the responsibility of the applicant to ensure that storm water entering the surrounding drainage system is not contaminated by spilled chemicals.
- d) All waste generated during the construction should be removed and disposed to a registered landfill site. No dumping may take place within the open spaces surrounding the study area. Such activity will lead to the recovery of costs from the contractor.
- e) All the recommendations and mitigation measures in the report and specialist studies in the attached appendices must be adhered to during the construction and operational phase of the development.
- f) Aliens and invasive plant species should be eradicated and managed on the study area according to the Conservation of Agricultural Resources Act (Act no. 43 of 1983) and Section 28 of the National Environmental Management Act, 1998. The Invasive species control plan should be implemented at least every 3 months after the completion of the activity and should be included within the final approved EMP. All areas disturbed as part of the proposed activity will be deemed as the study area.
- g) The wetland located outside the site is of high priority and can be somehow be indirectly affected or influenced by the proposed development, therefore cleaning of the feedlot and waste management should be part of the operational plan to avoid the ripple effect of the proposed activity on the adjacent wetland.

h) The activities on site must comply with the Tshwane Municipality's By-Laws.

6. CONCLUSION

The Department support the application subject to the consideration and adherence of the above-mentioned recommendations.

Yours faithfully,

 16/10/2013

Mr Livhuwani Siphuma Date

EXECUTIVE DIRECTOR: ENVIRONMENTAL MANAGEMENT DIVISION

Letter signed by: Rudzani Mukheli

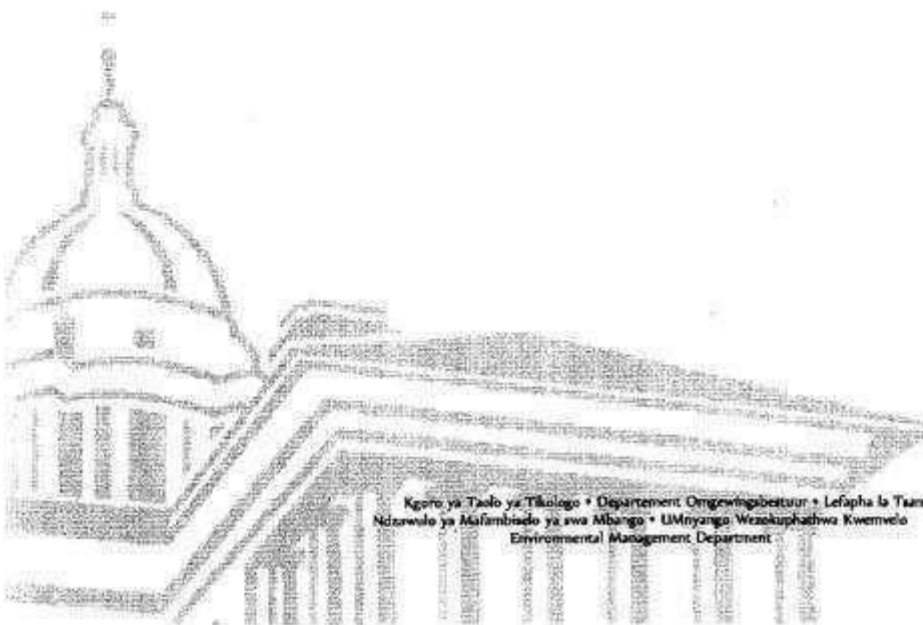
Designation: Deputy Director: Environmental Impact Management

CC: Gauteng Department of Agriculture and Rural Development

Mr. Junior Nkuna

Tel: (011) 355 1358

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Environmental Management Department

**Comments from I&Ap's on
Amendments to the BA Report
(Not yet available)**



Appendix E8

Copy of the Register of I&AP's



Appendix E9

Nr	Registered Parties	Contact details	Address
Stakeholders			
1	Council Geo-Science	jgrobler@geoscience.org.za	
2	SAHRA Gauteng	asalomon@sahra.org.za	
		nndobochani@sahra.org.za	
3	PHRAG	maphata.ramphele@gauteng.gov.za	
4	DWA	justicem@dwaf.gov.za	
		keetm@dwaf.gov.za	
		siwelanel@dwa.gov.za	
		tshifaror@dwa.gov.za	
5	Eskom	central@eskom.co.za	
		paia@eskom.co.za	
6	SANRAL	schmidk@nra.co.za	
7	Gautrans	kumen.govender@gauteng.gov.za	
8	Randwater	customerservice@randwater.co.za	
9	City of Tshwane	rudzanim@tshwane.gov.za	
10	Spoornet	daniel.ramokone@transnet.net	
11	DA Roads	casperm@tshwane.gov.za	
12	Ward Councillor	bruna.haipei@absamail.co.za	
	Bruna Haipei	Cell: 082 454 6956	
13	A. van Tonder	alwyn@sabroking.co.za	
	Ward Councillor	Cell: 082 593 0313	
14	Lilian Siwelane	siwelanel@dwa.gov.za	
	DWA		
15	Rabelani Tshifaro	tshifaror@dwa.gov.za	
	DWA		

**Comments from I&AP's
on the Application
(Not available)**



Appendix E10

**Water Use Licence(s), SAHRA Information,
Service Letters from Municipalities &
Water Supply Information
(Not Available)**



Appendix F

Please refer to Appendix G4 for the Geohydrology Study that contains information regarding water supply.

Specialist Reports



Appendix G

Ecological Fauna Habitat Survey



Appendix G1

ECOLOGICAL FAUNA HABITAT SURVEY

MLEKI'S BEEF



Macronyx capensis, Cape longclaw, at the site. This bird is a widespread species in South Africa that prefers grassy areas such as being present at the site.
Photo: May 2013, R.F. Terblanche.

JULY 2013

COMPILED BY:

Reinier F. Terblanche

(M.Sc, *Cum Laude*; Pr.Sci.Nat, Reg. No. 400244/05)

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1 INTRODUCTION

An ecological habitat survey of fauna was required for the proposed development at a farm area 13 km east-north-east of Cullinan in the Gauteng Province (elsewhere referred to as the site) to determine which threatened fauna may reside on the site. The survey focused on the possibility that fauna of conservation concern, which include threatened species, known to occur in Gauteng Province are likely to occur within the proposed development and site or not.

1.1 OBJECTIVES OF THE HABITAT STUDY

The objectives of the habitat study are to provide:

- A detailed fauna habitat survey;
- A detailed habitat survey of possible threatened or localised vertebrates and invertebrates;
- Recording of possible host plants (=foodplants) of fauna such as butterflies.
- Evaluate the conservation importance and significance of the site with special emphasis on the current status of threatened species;
- Literature investigation of possible species that may occur on site;
- Identification of potential ecological impacts on fauna that could occur as a result of the development; and
- Make recommendations to reduce or minimise impacts, should the development be approved.

1.2 SCOPE OF STUDY

- A survey consisting of four visits to investigate key elements of habitats on the site, relevant to the conservation of fauna.
- Recording of any sightings and/or evidence of existing fauna.
- The selective and careful collecting of voucher specimens of invertebrates where deemed necessary.
- An evaluation of the conservation importance and significance of the site with special emphasis on the current status of threatened species.
- Recording of possible host plants or foodplants of fauna such as butterflies.
- Literature investigation of possible species that might occur on site.
- Integration of the literature investigation and field observations to identify potential ecological impacts that could occur as a result of the development.
- Integration of literature investigation and field observations to make recommendations to reduce or minimise impacts, should the development be approved.

2 STUDY AREA

The study area is 13 km east-north-east of Cullinan in the Gauteng Province. The study site is situated at the Savanna Biome which is represented by the Central Sandy Bushveld vegetation type (Mucina & Rutherford 2006). Vegetation and landscape features of Central Sandy Bushveld include low undulating areas, sometimes between mountains, and sandy plains and catenas supporting tall *Terminalia sericea* and *Burkea africana* woodland on deep sandy soils (with the former often dominant on the lower slopes of sandy catenas) and low, broad-leaved *Combretum* woodland on shallow rocky or gravelly soils. Species of *Acacia*, *Ziziphus* and *Euclea* are found on flats and lower slopes on eutrophic sands and some less sandy soils. *A. tortilis* may dominate some areas along valleys. Grass-dominated herbaceous layer with relatively low cover is found on dystrophic sands (Mucina & Rutherford 2006). Climate is characterized by summer-rainfall, with very dry winters. Mean annual precipitation is 500-700 mm. Frost fairly infrequent (Mucina & Rutherford 2006).

At the proposed footprint, such as presented further in the results and discussion, the vegetation type of which the site has formed part does not have the trees listed above because the habitat has been modified by cultivation in the past. Indigenous trees occur south-west of the proposed footprint at a low rocky ridge.

3 METHODS

A desktop study comprised not only an initial phase, but also it was used throughout the study to accommodate and integrate all the data that become available during the field observations.

Surveys by R.F. Terblanche took place 26 May, 27 May 2013, 1 July 2013 and 11 July 2013 to note key elements of habitats on the site, relevant to the conservation of fauna. The main purpose of the site visits was ultimately to serve as a habitat survey that concentrated on the possible presence or not of threatened species and other species of high conservation priority.

The following sections highlight the materials and methods applicable to different aspects that were observed.

3.1 HABITAT CHARACTERISTICS AND VEGETATION

The habitat was investigated by noting habitat structure (rockiness, slope, plant structure/physiognomy) as well as floristic composition. Voucher specimens of plant species were only taken where the taxonomy was in doubt and where the plant specimens were of significant relevance for invertebrate conservation. Field guides such as those by Germishuizen (2003), Manning (2003), Manning (2009), Van Oudtshoorn (1999), Van Wyk (2000), Van Wyk & Malan (1998) and Van Wyk & Van Wyk (1997) were used to confirm the taxonomy of the species. Works on specific plant groups (often genera) such as those by Goldblatt (1986), Goldblatt & Manning (1998), Jacobsen (1983), McMurtry, Grobler, Grobler & Burns (2008), Smit (2008), Van Jaarsveld (2006) and Van Wyk & Smith (2003) were also consulted to confirm the identification of species. In this case no plant specimens were needed to be collected as voucher specimens or to be send to a herbarium for identification. For the most recent treatise of scientific plant names and broad distributions, Germishuizen, Meyer & Steenkamp (2006) were followed to compile the lists of species.

3.2 MAMMALS

Mammals were noted as sight records by day. For the identification of species and observation of diagnostic characteristics Smithers (1986), Skinner & Chimimba (2005), Cillié, Oberprieler and Joubert (2004) and Apps (2000) are consulted. Sites have been walked, covering as many habitats as possible. Signs of the presence of mammal species, such as calls of animals, animal tracks (spoor), burrows, runways, nests and faeces were recorded. Walker (1996), Stuart & Stuart (2000) and Liebenberg (1990) were consulted for additional information and for the identification of spoor and signs. Trapping was not done since it proved not necessary in the case of this study. Habitat characteristics were also surveyed to note potential occurrences of mammals. Many mammals can be identified from field sightings but, with a few exceptions bats, rodents and shrews can only be reliably identified in the hand, and even then some species needs examination of skulls, or even chromosomes (Apps, 2000).

3.3 BIRDS

Birds were noted as sight records, mainly with the aid of binoculars (10x30). Nearby bird calls of which the observer was sure of the identity were also recorded. For practical skills of noting diagnostic characteristics, the identification of species and observation techniques Ryan (2001) is

followed. For information on identification, biogeography and ecology Barnes (2000), Hockey, Dean & Ryan, P.G. (2005), Cillié, Oberprieler & Joubert (2004), Tarboton & Erasmus (1998), Chittenden (2007) and Sinclair & Ryan (2010) were consulted. Ringing of birds fell beyond the scope of this survey and was not deemed necessary. The site has been walked, covering as many habitats as possible. Signs of the presence of bird species such as spoor and nests have additionally been recorded. Habitat characteristics were surveyed to note potential occurrences of birds.

3.4 REPTILES

Reptiles were noted as sight records in the field. Binoculars (10x30) can also be used for identifying reptiles of which some are wary. For practical skills of noting diagnostic characteristics, the identification of species and observation techniques, Branch (1998), Marais (2004), Alexander & Marais (2007) and Cillié, Oberprieler and Joubert (2004) were followed. Sites were walked, covering as many habitats as possible. Smaller reptiles are sometimes collected for identification, but this practice was not necessary in the case of this study. Habitat characteristics were surveyed to note potential occurrences of reptiles.

3.5 AMPHIBIANS

Frogs and toads are noted as sight records in the field or by their calls. For practical skills of noting diagnostic characteristics, the identification of species and observation techniques Carruthers (2001), Du Preez (1996), Conradie, Du Preez, Smith & Weldon (2006) and the recent complete guide by Du Preez & Carruthers (2009) are consulted. CD's with frog calls by Carruthers (2001) and Du Preez & Carruthers (2009) are used to identify species by their calls when applicable. Sites are walked, covering as many habitats as possible. Smaller frogs are often collected by pitfall traps put out for epigeal invertebrates (on the soil), but this practice falls beyond the scope of this survey. Habitat characteristics are also surveyed to note potential occurrences of amphibians.

3.6 BUTTERFLIES

Butterflies were noted as sight records or voucher specimens. Voucher specimens are mostly taken of those species of which the taxa warrant collecting due to taxonomic difficulties or in the

cases where species can look similar in the veldt. Many butterflies use only one species or a limited number of plant species as host plants for their larvae. Myrmecophilous (ant-loving) butterflies such as the *Aloeides*, *Chrysoritis*, *Erikssonia*, *Lepidochrysops* and *Orachrysops* species (Lepidoptera: Lycaenidae), which live in association with a specific ant species, require a unique ecosystem for their survival (Deutschländer & Bredenkamp, 1999; Terblanche, Morghental & Cilliers, 2003; Edge, Cilliers & Terblanche, 2008; Gardiner & Terblanche, 2010). Known food plants of butterflies were therefore also recorded. After the visits to the site and the identification of the butterflies found there, a list was also compiled of butterflies that will most probably be found in the area in all the other seasons because of suitable habitat. The emphasis is on a habitat survey.

3.7 FRUIT CHAFER BEETLES

Different habitat types in the areas were explored for any sensitive or special fruit chafer species. Selection of methods to find fruit chafers depends on the different types of habitat present and the species that may be present. Fruit bait traps would probably not be successful for capturing *Ichnestoma* species in a grassland patch (Holm & Marais 1992). Possible chafer beetles of high conservation priority were noted as sight records accompanied by the collecting of voucher specimens with grass nets or containers where deemed necessary.

3.8 MYGALOMORPH SPIDERS AND ROCK SCORPIONS

Relatively homogenous habitat / vegetation areas were identified and explored to identify any sensitive or special species. Selected stones that were lifted to search for Arachnids were put back very carefully resulting in the least disturbance possible. The area was searched for possible signs of trap door spiders or other mygalomorph spiders (for example traces of wafer-lids, cork-lids or silk-lined burrows). Investigations by brushing the soil surface with a small broom/paint brush, scraping or digging into the soil with a spade, were made. All the above actions were accompanied by the least disturbance possible.

3.9 LIMITATIONS

For each site visited, it should be emphasized that surveys can by no means result in an exhaustive list of the animals present on the site, because of the time constraint. The on site

survey was conducted during May 2013 and July 2013 which is a suboptimal time of the year to find many of the habitat sensitive animal species of high conservation priority. Weather conditions during the survey were favourable for recording fauna. The focus of the survey remains a habitat survey that concentrates on the possibility that species of particular conservation priority occur on the site or not. It is unlikely that more surveys would alter the outcome of this study.

4 RESULTS

4.1 HABITAT AND VEGETATION CHARACTERISTICS

Table 4.1 Outline of main landscape and habitat characteristics of the site.

HABITAT FEATURE	DESCRIPTION
Topography	The site proposed for the footprint is on gentle slopes.
Rockiness	No rocky ridges are present at the footprint proposed for the development, but a rocky ridge is present at the site south-west of the proposed footprint of development.
Presence of wetlands	No wetlands are present at the proposed footprint of development. However there is a drainage line with riparian and wetland zones at the south western part of the site.
Broad overview of vegetation	Though the site is part of the Central Sandy Bushveld a large part of it consists of grassland where no trees are present being cultivated or historically being cultivated. Indigenous trees are present on the rocky ridge in the central part of the site and also at the western part of the site. On close inspection the basal cover of the grass appear to be low at many areas with lots of the sandy soil being visible between the grasses at the footprint for the development. Perennial grass species such as <i>Eragrostis curvula</i> and <i>Cynodon dactylon</i> as well as annual grass species such as <i>Melinis repens</i> are conspicuous at the proposed footprint. A number of exotic weeds establish among the grass in particular <i>Tagetes minuta</i> (khaki weed). There is an area in the western and south western parts of the site where taller and denser grass is present with the most conspicuous and dominant grass species <i>Hyparrhenia hirta</i> (thatch grass). At the western part of the site an extensive area with mainly <i>Acacia karroo</i> (sweet thorn) and mixed woodland that includes <i>Acacia caffra</i> , <i>Cussonia</i> species, <i>Gymnosporia buxifolia</i> and <i>Euclea crispa</i> is present.
Signs of disturbances	The site has a history of being cultivated and part of the land on which the site is located is still rolled in hay bales. Disturbances at the site are mainly tracks and establishment of pioneer plant species and exotic weeds owing to a history of being cultivated.
Connectivity of natural vegetation in the site and between the site and surrounding areas	There is little scope for the site to be a part of a corridor of particular conservation importance, though the drainage line and woodland at the south western part of the site should be viewed as an important conservation corridor in the larger area.



Photo 1 View of the typical vegetation structure at the proposed footprint at the Mleki's Beef site. Grasses, mainly *Eragrostis* species with exotic weeds, mainly of the genera *Bidens* (black jack), *Tagetes* (khaki weed) and *Cosmos* (cosmos) are conspicuous. This type of habitat on sandy soil is suitable for common rodents such as *Tatera leucogaster* (bushveld gerbil) and *Tatera brantsii* (highveld gerbil).
Photo: May 2013, R.F. Terblanche



Photo 2 View from the footprint towards the north in the larger area. Wetlands along a tributary of the Elands river are about 900 m outside the northern edge of the footprint at the valley bottom. This valley bottom is visible in the distance in the picture.
Photo: May 2013, R.F. Terblanche.



Photo 3 *Macronyx capensis*, Cape longclaw, at the site. This bird is a widespread species in SouthAfrica that prefers grassy areas such as being present at the site.
Photo: May 2013, R.F. Terblanche.



Photo 4 *Danaus chrysippus*, the African monarch butterfly, a widespread species that utilises the nectar of the indigenous *Polydora poskeana* (= *Vernonia poskeana*) at the site.
Photo: May 2013, R.F. Terblanche.

4.2 Assessment of Vertebrate Species of Conservation Concern

4.2.1 Mammals of particular high conservation priority

Table 4.2: Threatened mammal species of the Gauteng Province. Literature sources: Friedman & Daly, (2004), Skinner & Chimimba (2005), Wilson & Reeder (2005). Furthermore golden mole species that are rare and being reported from the adjacent Free State and Limpopo Provinces have also been included.

Species	Red Listed Status	Recorded at site during survey	Likely to be found based on habitat assessment
<i>Chrysofalax villosus</i> Rough-haired golden mole	Vulnerable	No	No
<i>Cloeotis percivali</i> Short-eared Trident Bat	Vulnerable/ Near-threatened	No	No
<i>Diceros bicornis</i> Black rhinoceros	Critically Endangered	No	No
<i>Lycaon pictus</i> African wild dog	Endangered	No	No
<i>Loxodonta africana</i> African elephant	Vulnerable	No	No
<i>Mystromys albicaudatus</i> White-tailed mouse	Endangered	No	No
<i>Neamblysomus julianae</i> Juliana's Golden Mole	Critically Endangered	No	No
<i>Panthera leo</i> Lion	Vulnerable	No	No
<i>Rhinolophus blasii</i> Blasi's Horseshoe Bat	Vulnerable	No	No

Table 4.3: Near threatened mammal species known to occur in the Gauteng Province, Free State Province and North-West Province. Literature sources: Skinner & Chimimba (2005).

Species	Red Listed Status	Recorded at site during survey	Likely to be found based on habitat assessment
<i>Ceratotherium simum</i> White Rhinoceros	Near-threatened	No	No
<i>Manis temminckii</i> Ground Pangolin	Lower risk/ Near threatened	No	No

4.2.2 Birds of particular high conservation priority

Table 4.4: Threatened bird species of the Gauteng Province. Literature sources Barnes (2000), Hockey, Dean & Ryan, P.G. (2005) and Chittenden (2007).

Species	Common name	Red Listed Status	Recorded at site during survey	Likely to be found breeding on site based on being dependant on site
<i>Aegypius tracheliotos</i>	Lappet-faced Vulture	Vulnerable	No	No
<i>Anthropoides paradiseus</i>	Blue Crane	Vulnerable	No	No
<i>Aquila rapax</i>	Tawny Eagle	Vulnerable	No	No
<i>Ardeotis kori</i>	Kori Bustard	Vulnerable	No	No
<i>Botaurus stellaris</i>	Eurasian Bittern	Critically Endangered	No	No
<i>Buphagus africanus</i>	Yellow-billed Oxpecker	Vulnerable	No	No
<i>Circus ranivorus</i>	African Marsh-Harrier	Vulnerable	No	No
<i>Crex crex</i>	Corn Crane	Vulnerable	No	No
<i>Eupodotis senegalensis</i>	White-bellied Korhaan	Vulnerable	No	No
<i>Gorsachius leuconotus</i>	White-backed Night-heron	Vulnerable	No	No
<i>Gyps africanus</i>	White-backed Vulture	Vulnerable	No	No
<i>Gyps coprotheres</i>	Cape Vulture	Vulnerable	No	No
<i>Neophron percnopterus</i>	Egyptian Vulture	Regionally almost extinct	No	No
<i>Neotis denhami</i>	Denham's Bustard	Vulnerable	No	No
<i>Pelecanus rufescens</i>	Pink-backed Pelican	Vulnerable	No	No
<i>Polemaetus bellicosus</i>	Martial Eagle	Vulnerable	No	No
<i>Rhynchops flavirostris</i>	African Skimmer	Endangered	No	No
<i>Sarothrura ayresi</i>	White-winged Flufftail	Critically Endangered	No	No
<i>Therathopius ecaudatus</i>	Bateleur	Vulnerable (in South Africa)	No	No
<i>Tyto capensis</i>	African Grass-Owl	Vulnerable	No	No

Table 4.5: Near threatened bird species of the Gauteng Province. Literature sources Barnes (2000), Hockey, Dean & Ryan, P.G. (2005) and Chittenden (2007).

Species	Common name	Red Listed Status	Recorded at site during survey	Likely to be found breeding on site based or being dependant on site
<i>Alcedo semitorquata</i>	Half-collared Kingfisher	Near threatened	No	No
<i>Anastomus lamelligerus</i>	African Openbill	Near threatened	No	No
<i>Aquila ayresii</i>	Ayres's Hawk-Eagle	Near threatened	No	No
<i>Buphagus erythrorhynchus</i>	Red-Billed Oxpecker	Near threatened	No	No
<i>Charadrius pallidus</i>	Chestnut-banded Plover	Near threatened	No	No
<i>Ciconia nigra</i>	Black Stork	Near threatened	No	No
<i>Circus macrourus</i>	Pallid Harrier	Near threatened	No	No
<i>Falco biarmicus</i>	Lanner Falcon	Near threatened	No	No
<i>Falco peregrinus</i>	Peregrine Falcon	Near threatened	No	No
<i>Glareola nordmanni</i>	Black-winged Pratincole	Near threatened	No	No
<i>Leptoptilos crumeniferus</i>	Marabou Stork	Near threatened	No	No
<i>Mirafra cheniana</i>	Melodious lark	Near threatened	No	No
<i>Mycteria ibis</i>	Yellow-billed Stork	Near threatened	No	No
<i>Pelecanus onocrotalus</i>	Great White Pelican	Near threatened	No	No
<i>Phoenicopterus minor</i>	Lesser Flamingo	Near threatened	No	No
<i>Phoenicopterus ruber</i>	Greater Flamingo	Near threatened	No	No
<i>Pterocles gutturalis</i>	Yellow-throated Sandgrouse	Near threatened	No	No
<i>Rostratula benghalensis</i>	Greater Painted-snipe	Near threatened	No	No
<i>Sagittarius serpentarius</i>	Secretarybird	Near threatened	No	No
<i>Sterna caspia</i>	Caspian Tern	Near threatened	No	No

4.2.3 Reptiles of particular high conservation priority

The following tables list possible presence or absence of threatened reptile or near threatened reptile species in the study area. The Southern African Reptile Conservation Assessment (SARCA) was launched in May 2005 (Branch, Tolley, Cunningham, Bauer, Alexander, Harrison, Turner & Bates, 2006). Its primary aim is to produce a conservation assessment for reptiles of South Africa, Lesotho and Swaziland within the near future (Branch *et al.*, 2006). A full up-dated conservation assessment of reptiles, taking into account the recent IUCN (2001) criteria, can only be used once it becomes available. Alexander & Marais (2007) and Tolley & Burger (2007) give useful indications of present conservation statuses as well as possible red listings of reptile species and subspecies in the near future.

Table 4.6: Threatened reptile species in Gauteng Province. Sources: Alexander & Marais (2007). No = Reptile species is not a resident on the site; Yes = Reptile species is found to be resident on the site.

Species	Red Listed Status	Resident at site	Recorded at site during survey	Likely to be found based on habitat assessment
<i>Python natalensis</i> Southern African Python	Vulnerable*	No	No	No

Table 4.7: Near threatened reptile species in Gauteng Province. Sources: Alexander & Marais (2007). No = Reptile species is not a resident on the site; Yes = Reptile species is found to be resident on the site.

Species	Red Listed Status	Resident at site	Recorded at site during survey	Likely to be found based on habitat assessment
<i>Homoroselaps dorsalis</i> Striped Harlequin Snake	Near threatened	No	No	No

4.3 Assessment of Invertebrate Species of Conservation Concern

4.3.1 Butterflies of particular conservation priority

Table 4.8 Threatened (Endangered) butterfly species of the Gauteng Province. Sources: Mecenero *et al.* (2013), Henning, Terblanche & Ball (2009).

Species	Red List Status (Global status)	Recorded at site during survey	Residential status at the site: Confirmed, Highly likely, Likely, Medium possibility, Unlikely, Highly unlikely
<i>Aloeides dentatis dentatis</i> Roodepoort Copper	Endangered	No	Highly unlikely
<i>Chrysochrysis aureus</i> Golden Opal/ Heidelberg Opal	Endangered	No	Highly unlikely
<i>Lepidochrysis praeterita</i> Highveld Blue	Endangered	No	Highly unlikely
<i>Orachrysis mijburghi</i> Mijburgh's Blue	Endangered	No	Highly unlikely

Table 4.9: Rare butterfly species of the Gauteng Province. Source: Mecenero *et al.* (2013).

Species	Red List Status	Recorded at site during survey	Residential status at the site: Confirmed, Highly likely, Likely, Medium possibility, Unlikely, Highly unlikely
<i>Colotis celimene amina</i> Lilac Tip	Rare (Low density)	No	Highly unlikely
<i>Lepidochrysis procera</i> Grassland Blue	Rare (Habitat specialist)	No	Highly unlikely
<i>Metisella meninx</i> Marsh Sylph	Rare (Habitat specialist)	No	Highly unlikely
<i>Platylesches dolomitica</i> (Hilltop hopper)	Rare (Low density)	No	Highly unlikely

4.3.2 Beetles of particular conservation priority

Table 4.10: Fruit chafer species (Coleoptera: Scarabaeidae: Cetoninae) in the Gauteng Province and Gauteng Province which are of known high conservation priority.

Species	Red Listed Status	Resident at site	Recorded at site during survey	Likely to be found based on habitat assessment
<i>Ichneustoma stobbiai</i>	Uncertain (Probably endangered)	No	No	No
<i>Trichocephala brincki</i>	Uncertain	No	No	No

4.3.3 Mygalomorph spiders of particular conservation priority

Table 4.11: Baboon spiders species (Araneae: Teraphosidae) species that are of known high conservation priority in the Gauteng Province and Gauteng Province.

Species	Red Listed Status	Resident at site	Recorded at site during survey	Likely to be found based on habitat assessment
<i>Brachionopus pretoriae</i>	Uncertain	No	No	No

4.3.4 Scorpions of particular conservation priority

Table 4.12: Rock scorpion species (Scorpiones: Ischnuridae) species that are of known high conservation priority in the Gauteng Province and North West Province.

Species	Red Listed Status	Resident at site	Recorded at site during survey	Likely to be found based on habitat assessment
<i>Hadogenes gracilis</i>	Uncertain	No	No	No
<i>Hadogenes gunningi</i>	Uncertain	No	No	No

5 DISCUSSION

5.1 HABITAT AND VEGETATION CHARACTERISTICS

An outline of the habitat and vegetation characteristics is given in Table 4.1. At the proposed footprint the Central Sandy Bushveld has been transformed into conspicuously low ecological status grassland.

5.2 VERTEBRATES

5.2.1 Mammals

Table 4.2 and Table 4.3 list the possible presence or absence of threatened mammal species and near threatened mammal species at the site. Literature sources that were used are Friedman & Daly (2004), Skinner & Chimimba (2005) and Wilson & Reeder (2005). Because the site falls outside reserves, threatened species such as the black rhinoceros (*Diceros bicornis*) and the African wild dog (*Lycaon pictus*) are obviously not present. No smaller mammals of particular high conservation significance are likely to be found on the site as well.

5.2.2 Avi-Fauna

Table 4.4 and Table 4.5 list the possible presence or absence of threatened bird species and near threatened bird species at the site. Literature sources that were mainly consulted are Barnes (2000), Hockey, Dean & Ryan, P.G. (2005) and Chittenden (2007). The site does not appear to form part of any habitat of particular importance for any threatened bird species or any bird species of particular conservation importance. In the case of this study, the presence or not of *Anthropoides paradiseus*, Blue Crane and *Tyto capensis*, African grass-owl, deserve particular reference.

5.2.2.1 *Anthropoides paradiseus* (Blue Crane)

Anthropoides paradiseus is listed as regionally vulnerable in South Africa (Hockey, Dean & Ryan 2005). Ideal habitat for *Anthropoides paradiseus* (Blue Crane) is found in grassland, agricultural lands (croplands) and cultivated pastures (Chittenden 2007, Sinclair & Ryan 2010). The birds appear to roost in shallow water at night (Chittenden 2007). No *Anthropoides paradiseus*, the blue crane, was recorded on the site, though it can not be excluded that this bird may be a visitor at and near the site. However, there is not evidence that the site is particular suitable habitat or being used as particular habitat for this bird species and it is unlikely that the development, if approved, will be a distinct threat to this species.

5.2.2.2 *Tyto capensis* (African Grass-owl)

Tyto capensis is listed as regionally vulnerable in South Africa (Hockey, Dean & Ryan 2005). *Tyto capensis* (African Grass-owl) is often found as a resident in treeless areas with damp substrata, mainly marshes and vleis (Hockey, Dean & Ryan 2005). This owl favours patches of tall, rank grass, sedges or weeds (Armstrong, 1991). No *Tyto capensis* was recorded on the site, no particular suitable habitat for this owl species has been found at the site and it is unlikely that the African grass-owl will be present.

5.2.3 Reptiles

Table 4.7 and Table 4.8 list the possible presence or absence of threatened and near threatened reptile species on the site. The Southern African Reptile Conservation Assessment (SARCA) was launched in May 2005 (Branch, Tolley, Cunningham, Bauer, Alexander, Harrison, Turner & Bates, 2006). Its primary aim is to produce a conservation assessment for reptiles of South Africa, Lesotho and Swaziland within the near future (Branch *et al.*, 2006). Therefore a full up-dated conservation assessment of reptiles, taking into account the recent IUCN (2001) criteria, will only be available in the near future. While the conservation statuses of reptile species are under revision Alexander & Marais (2007) as well as Tolley & Burger 2007) give useful indications of possible red listings in the near future. There appears to be no threat to any reptile species of particular high conservation importance if the site is developed.

5.2.4 Amphibians

No frog species that occur in the Gauteng are red listed as threatened species or near threatened species at present. There appears to be no threat to any amphibian species of particular high conservation importance if the site is developed.

5.3 INVERTEBRATES

5.3.1 Butterflies

Studies about the vegetation and habitat of threatened butterfly species in South Africa showed that ecosystems with a unique combination of features are selected by these often localised threatened butterfly species (Deutschländer and Bredenkamp 1999; Edge 2002, 2005; Terblanche, Morgenthal & Cilliers 2003; Lubke, Hoare, Victor & Ketelaar 2003; Edge, Cilliers & Terblanche, 2008). Threatened butterfly species in South Africa can then be regarded as bio-indicators of rare ecosystems.

Because invertebrates are often less well known the expected presence or not of threatened butterfly species in the Endangered category (Table 4.8) and other high conservation priority species such as Rare butterfly species (Table 4.9) follows.

5.3.1.1 Assessment of threatened butterfly species (Endangered) in the Gauteng Province

Aloeides dentatis dentatis (Roodepoort Copper)

The proposed global red list status for *Aloeides dentatis dentatis* according to the most recent IUCN criteria and categories is Endangered (Mecenero *et al.* 2013). *Aloeides dentatis dentatis* colonies are found where one of its host plants *Hermannia depressa* or *Lotononis eriantha* is present. Larval ant association is with *Lepisiota capensis* (S.F. Henning 1983; S.F. Henning & G.A. Henning 1989). The habitat requirements of *Aloeides dentatis dentatis* are complex and not fully understood yet. See Deutschländer and Bredenkamp (1999) for the description of the vegetation and habitat characteristics of one locality of *Aloeides dentatis* subsp. *dentatis* at Ruimsig, Roodepoort, Gauteng Province. There is not an ideal habitat of *Aloeides dentatis* subsp. *dentatis* on the site and it is unlikely that the butterfly is present at the site.

Chrysochrysis aureus (Golden Opal/ Heidelberg Copper)

The proposed global red list status for *Chrysochrysis aureus* according to the most recent IUCN criteria and categories is Endangered (Mecenero *et al.* 2013) *Chrysochrysis aureus* (Golden Opal/ Heidelberg Copper) is a resident where the larval host plant, *Clusia pulchella* is present. However, the distribution of the butterfly is much more restricted than that of the larval host plant (S.F. Henning 1983; Terblanche, Morgenthal & Cilliers 2003). One of the reasons for the localised distribution of *Chrysochrysis aureus* is that a specific host ant *Crematogaster liengmei* must also be present at the habitat. Fire appears to be an essential factor for the maintenance of suitable habitat (Terblanche, Morgenthal & Cilliers 2003). Research revealed that *Chrysochrysis aureus* (Golden Opal/ Heidelberg Copper) has very specific habitat requirements, which include rocky ridges with a steep slope and a southern aspect (Terblanche, Morgenthal & Cilliers 2003). Owing to a lack of habitat requirements and ideal habitat the presence of the taxon is highly unlikely.

Lepidochrysis praeterita (Highveld Blue)

The proposed global red list status for *Lepidochrysis praeterita* according to the most recent IUCN criteria and categories is Endangered (G.A. Henning, Terblanche & Ball, 2009; Mecenero *et al.* 2013). *Lepidochrysis praeterita* is a butterfly that occurs where the larval host plant *Ocimum obovatum* (= *Becium obovatum*) is present (Pringle, G.A. Henning & Ball, 1994), but the distribution of the butterfly is much more restricted than the distribution of the host plant. *Lepidochrysis praeterita* is found on selected rocky ridges and rocky hillsides in parts of Gauteng, the extreme northern Free State and the south-eastern

Gauteng Province. No ideal habitat appears to be present for the butterfly on the site. It is unlikely that *Lepidochrysops praeterita* would be present on the site and at the footprint proposed for the development.

Orachrysops mijburghi (Mijburgh's Blue)

The proposed global red status for *Orachrysops mijburghi* according to the most recent IUCN criteria and categories is Endangered (Mecenero *et al.* 2013). *Orachrysops mijburghi* favours grassland depressions where specific *Indigofera* plant species occur (Terblanche & Edge 2007). The Heilbron population of *Orachrysops mijburghi* in the Free State uses *Indigofera evansiana* as a larval host plant (Edge, 2005) while the Suikerbosrand population in Gauteng uses *Indigofera dimidiata* as a larval host plant (Terblanche & Edge 2007). There is no suitable habitat for *Orachrysops mijburghi* on the site and it is unlikely that *Orachrysops mijburghi* would be present on the site.

Conclusion on threatened butterfly species

There appears to be no threat to any red listed butterfly species if the site is developed.

5.3.1.2 Butterfly species that are not threatened but also of high conservation priority

Colotis celimene amina (Lilac tip)

Colotis celimene amina is listed as Rare (Low density) by Mecenero *et al.* (2013). In South Africa *Colotis celimene amina* is present from Pietermaritzburg in the south and northwards into parts of Kwa-Zulu Natal, Gauteng, Limpopo, Mpumalanga and the North West Provinces (Mecenero *et al.* 2013). Reasons for its rarity are poorly understood. It is highly unlikely that *Colotis celimene amina* would be present at the site.

Lepidochrysops procera (Savanna Blue)

Lepidochrysops procera is listed as Rare (Habitat specialist) by Mecenero *et al.* (2013). *Lepidochrysops procera* is endemic to South Africa and found in Gauteng, KwaZulu-Natal, Mpumalanga and North West (Mecenero *et al.* 2013). Owing to a lack of habitat requirements and ideal habitat the presence of the taxon at the site is highly unlikely.

Metisella meninx (Marsh Sylph)

Henning and Henning (1989) in the first South African Red Data Book of butterflies' listed *Metisella meninx* as threatened under the former IUCN category Indeterminate. Even earlier in the 20th century Swanepoel (1953) raised concern about vanishing wetlands leading to habitat loss and loss of populations of *Metisella meninx*. According to the second South African Red Data Book of butterflies (Henning, Terblanche & Ball, 2009) the proposed global red list status of *Metisella meninx* has been Vulnerable. During a recent large

scale atlasing project the Conservation Assessment of Butterflies of South Africa, Lesotho and Swaziland: Red List and Atlas (Mecenero *et al.* 2013) it was found that more *Metisella meninx* populations are present than thought before. Based on this valid new information, the conservation status of *Metisella meninx* is now regarded as Rare (Habitat specialist) (Mecenero *et al.* 2013). Though *Metisella meninx* is more widespread and less threatened than perceived before, it should be regarded as a localised rare habitat specialist of conservation priority, which is dependent on wetlands with suitable patches of grass at wetlands (Terblanche In prep.). Another important factor to keep in mind for the conservation of *Metisella meninx* is that based on very recent discoveries of new taxa in the group the present *Metisella meninx* is a species complex consisting of at least three taxa (Terblanche In prep., Terblanche & Henning In prep.). The ideal habitat of *Metisella meninx* is treeless marshy areas where *Leersia hexandra* (rice grass) is abundant (Terblanche In prep.). The larval host plant of *Metisella meninx* is wild rice grass, *Leersia hexandra* (G.A. Henning & Roos, 2001). Owing to a lack of habitat requirements and ideal habitat the presence of the taxon at the site is highly unlikely that the marsh sylph butterfly would be present at the site.

Platylesches dolomitica (Hilltop Hopper)

Platylesches dolomitica is listed as Rare (Low density) by Mecenero *et al.* (2013). Historically the conservation status of *Platylesches dolomitica* was proposed to be Vulnerable (Henning, Terblanche & Ball 2009). However, this butterfly which is easily overlooked has a wider distribution than perceived before. *Platylesches dolomitica* has a patchy distribution and is found on rocky ledges where *Parinari capensis* occurs, between 1300 m and 1800m (Mecenero *et al.* 2013, Dobson Pers comm.). At the site and footprint proposed for development it is unlikely that *Platylesches dolomitica* would be present.

5.3.2 Fruit Chafer Beetles

Table 4.10 lists the fruit chafer beetle species (Coleoptera: Scarabaeidae: Cetoniinae) that are of known high conservation priority in the Gauteng Province. No *Ichnestoma stobbiai* or *Trichocephala brincki* were found during the surveys. There appears to be no suitable habitat for *Ichnestoma stobbiai* or *Trichocephala brincki* at the site. There appears to be no threat to any of the fruit chafer beetles of particular high conservation priority if the site is developed.

5.3.3 Mygalomorph Spiders

Table 4.11 lists the baboon spider species (Araneae: Teraphosidae) that are of known high conservation priority in the Gauteng Province. The assessment of the conservation status of baboon spiders in South Africa is in process but as a pre-caution the species listed in Table 18 has been included. None of the above baboon spider species were found on the site, or are likely to be resident at the site. There appears to be no threat to the baboon spider species of high conservation significance if the study site is developed.

5.3.4 Scorpions

Table 4.12 lists the rock scorpion species (Scorpiones: Ischnuridae) that are of known high conservation priority in the Gauteng Province. There appears to be no threat to the rock scorpion species of high conservation priority if the study site is developed.

6 IMPACT ASSESSMENT AND MITIGATION MEASURES

Habitat conservation is the key to the conservation of invertebrates such as threatened butterflies (Deuschländer and Bredenkamp 1999; Edge 2002, 2005; Terblanche, Morgenthal & Cilliers 2003; Lubke, Hoare, Victor & Ketelaar 2003; Edge, Cilliers & Terblanche, 2008). Furthermore corridors and linkages may play a significant role in insect conservation (Pryke & Samways, 2003, Samways, 2005). This is also true for any detailed planning of corridors and buffer zones for invertebrates. Though proper management plans for habitats are not in place, setting aside special ecosystems is in line with the recent Biodiversity Act (2004) of the Republic of South Africa.

Corridors are important to link ecosystems of high conservation priority. Such corridors or linkages are there to improve the chances of survival of otherwise isolated populations (Samways, 2005). How wide should corridors be? The answer to this question depends on the conservation goal and the focal species (Samways, 2005). For an African butterfly assemblage this may be about 250m when the corridor is for movement as well as being a habitat source (Pryke and Samways 2003). Hill (1995) found a figure of 200m for dung beetles in tropical Australian forest. In the agricultural context, and at least for some common insects, even small corridors can play a valuable role (Samways, 2005). Much more research remains to be done to find refined answers to the width of grassland corridors in South Africa. The width of corridors will also depend on the type of development, for instance the effects of the shade of multiple story buildings will be quite different from that of small houses. To summarise: In practice, as far as residential developments are concerned, the key would be to prioritise and plan according to sensitive species and special ecosystems.

In the case of this study human impacts of the recent past and present are mainly the transformation of vegetation to cultivated or hitherto cultivated fields. Owing to low microhabitat diversity and degradation of the indigenous natural vegetation at the proposed footprint a low diversity of fauna species is anticipated. In the larger study site at the southwestern part of the site, there is higher microhabitat diversity and subsequently a higher faunal diversity is expected. There appears to be no loss of any particular unique ecosystems, if the site is developed, apart from the drainage line area with associated riparian zones. There appears to be no loss of any particular sensitive species, if the site is developed. An important consideration for the

conservation of fauna in the area is to focus on establishing indigenous vegetation and to continuously eradicate alien invasive plant species.

7 CONCLUSION

The site has been cultivated and consists of grassland with a conspicuous concentration of low ecological status grass species and exotic weeds. Owing to relatively low microhabitat diversity at the footprint proposed for the development a low faunal diversity is anticipated while a higher diversity is expected at the woodland and drainage line at the south western parts of the site. No loss of particular habitat or connectivity in terms of fauna is foreseen for the present footprint and the proposed footprint at the site, apart from the drainage line area at the south western part of the site which should be conserved as an important corridor for fauna.

Particular reference is given to *Anthropoides paradiseus* that is listed as regionally vulnerable in South Africa (Hockey, Dean & Ryan 2005). Ideal habitat for *Anthropoides paradiseus* (Blue Crane) is found in grassland, agricultural lands (croplands) and cultivated pastures (Chittenden 2007, Sinclair & Ryan 2010). The birds appear to roost in shallow water at night (Chittenden 2007). No *Anthropoides paradiseus*, the blue crane, was recorded on the site, though it can not be excluded that this bird may be a visitor at and near the site. However, there is not evidence that the site is particular suitable habitat or being used as particular habitat for this bird species and it is unlikely that the development, if approved, will be a distinct threat to this species.

It is unlikely that there are any threatened animal species or any other animal species of particular conservation concern distinctly using the site as a habitat. It is therefore concluded that there would be no threat to any threatened species or any other species of particular conservation concern at the site for the proposed footprint.

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Wetland Assessment



Appendix G2

WETLAND ASSESSMENT

Mlekis Beef



Cracks in seasonally inundated soil at watercourse that crosses south western extreme of the site.

Photo: July 2013, R.F. Terblanche.

JULY 2013

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1 INTRODUCTION

A wetland assessment is required for feedlots at Mlekis Beef properties 13 km east-north-east of Cullinan in the Gauteng Province (elsewhere referred to as the site) to assess wetlands if present at the site. If wetlands are present on the site the assessment further focuses on the hydro-geomorphic setting, an estimate of the properties of the wetlands, an assessment of the functional aspects of wetlands and an impact assessment to wetlands, should the development be approved.

1.1 Wetlands in South Africa

Wetlands are defined by the National Water Act (Act 36 of 1998) as:

“land which is transitional between terrestrial and aquatic ecosystems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil”.

According to *A practical field procedure for identification and delineation of wetlands and riparian areas* (DWAF 2005) wetlands must have one or more of the following attributes:

- Wetland (hydromorphic) soils that display characteristics resulting from prolonged saturation
- The presence, at least occasionally, of water loving plants (hydrophytes)
- A high water table that results in saturation at or near the surface, leading to anaerobic conditions developing in the top 50cm of the soil

Wetlands, according to the definition of DWAF (2005) are at the interface of aquatic systems and the terrestrial environment. As such the characteristics of the surface water or near surface water in space and time at this interface between the terrestrial and aquatic environment are fundamental to understand the functioning of a particular wetland. At the higher elevations of South Africa surface water at wetlands are characterised by considerable contrasts between seasons and periodic precipitation events. Generally accepted definitions of wetlands which focus on the wetland attributes of soil and vegetation are therefore useful because of its consistency despite seasonal fluctuations.

The Classification System for Wetlands and other Aquatic Ecosystems in South Africa (Ollis *et al.*, 2013) includes wetland ecosystems defined by the National Water Act (Act 36 of 1998) as well as those “wetland systems” defined by the Ramsar Convention. The broader definition of wetlands, according to the Ramsar Convention is that wetlands are areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water to the depth of which at low tide does not exceed six metres (cited by Ramsar Convention Secretariat 2011). This Ramsar definition of “wetlands” overlaps broadly with the definition of aquatic systems according to the South African system of classifying wetlands and other aquatic ecosystems. In South Africa an aquatic ecosystem is an ecosystem that is permanently or periodically inundated by flowing or standing water, or which has soils that are permanently or periodically saturated within 0.5 m of the soil surface (Ollis *et al.*, 2013). Therefore an important consideration of the Classification System for Wetlands and other Aquatic Ecosystems in South Africa (Ollis *et al.*, 2013) is that a wetland (narrow definition according to water act and not Ramsar definition) is taken to be a unique type of aquatic system.

1.2 Importance of wetlands

The importance of wetlands for human well-being and the conservation of biodiversity are recognised world-wide. Ecosystem services which directly or indirectly benefit human well-being are of particular importance when wetlands are considered. Wetlands play a major role to enhance supporting services such as nutrient cycling and primary production, which in turn is the basis for other ecosystem services. Wetlands are very important to regulating services such as maintaining water flow and water quality by processing water and regulating water run-off, provisioning services such as providing freshwater, cultural services such as appreciating the landscape and biodiversity. Overall wetlands play a major role in the sustainability of land use from socio-economic and biodiversity conservation perspectives. The setting and function of wetlands at each site should therefore be evaluated to inform land use management.

Wetland vegetation is of significant importance for wetlands to play a role in valuable ecosystem services. Vegetation plays an important role in natural wetland ecosystems. It holds soil together and slows down the flow of water, reducing the risk of erosion and promoting sediment deposition. Plants are the source of organic material in wetland soils, and form the organic soil in peat wetlands. Vegetation also has an impact on the quality of surface and subsurface water as it (1)

provides organic soil matter required by microbes in order to assimilate nutrients and toxicants (2) provides habitat for the microbes in the soil immediately surrounding the roots, and (3) contributes through direct uptake of nutrients and toxicants and incorporation of these into plant tissues (Sieben *et al.* 2009).

1.3 Aims and objectives of the survey

A survey consisting of three visits to investigate key elements of habitats on the site, relevant to the conservation of wetlands are conducted. The importance and significance of the site with special emphasis on the current status of biodiversity and ecological services of the wetland are evaluated. Literature investigations are integrated with field observations to identify potential ecological impacts that could occur as a result of the development and to make recommendations to reduce or minimise impacts, should the development be approved.

The objectives of the wetland habitat assessment are to provide:

- An indication of the existence of wetlands at the site and if so:
- An identification of major aspects of the hydro-geomorphic setting and terrain unit at which the wetland occur;
- An estimate of the size and roughness of the wetland
- An indication of the hydric soils at the site;
- An indication of erodability;
- An indication of the presence or absence of peat at the site;
- An outline of hydrological drivers that support the existence and character of the wetland;
- An assessment of the possible presence or absence of threatened or localised plant species, vertebrates and invertebrates of the region, at the site;
- A description of the functions provided by the wetland at the site;
- An interpretation of the priority of the wetland for local communities in the area;
- An interpretation of the priority of the wetland to biodiversity at the site;

2 STUDY AREA

The study area is 13 km east-north-east of Cullinan in the Gauteng Province. The study site is situated at the Savanna Biome which is represented by the Central Sandy Bushveld vegetation type (Mucina & Rutherford 2006). Vegetation and landscape features of Central Sandy Bushveld include low undulating areas, sometimes between mountains, and sandy plains and catenas supporting tall *Terminalia sericea* and *Burkea africana* woodland on deep sandy soils (with the former often dominant on the lower slopes of sandy catenas) and low, broad-leaved *Combretum* woodland on shallow rocky or gravelly soils. Species of *Acacia*, *Ziziphus* and *Euclea* are found on flats and lower slopes on eutrophic sands and some less sandy soils. *A. tortilis* may dominate some areas along valleys. Grass-dominated herbaceous layer with relatively low cover is found on dystrophic sands (Mucina & Rutherford 2006). Climate is characterized by summer-rainfall, with very dry winters. Mean annual precipitation is 500-700 mm. Frost fairly infrequent (Mucina & Rutherford 2006).

3 METHODS

A desktop study comprised not only an initial phase, but also it was used throughout the study to accommodate and integrate all the data that become available during the field observations.

Surveys by R.F. Terblanche took place 26 May, 27 May 2013, 1 July 2013 and 11 July 2013 to note key elements of habitats on the site, relevant to the conservation of fauna. The main purpose of the site visits was ultimately to serve as a habitat survey that concentrated on the possible presence or not of threatened species and other species of high conservation priority.

Classification of any inland wetland systems that could be present at the site is according to the Classification System for Wetlands and other Aquatic Ecosystems in South Africa (Ollis *et al.*, 2013). One of the major advantages of the Classification System for South Africa (Ollis *et al.*, 2013) is that the functional aspects of wetlands are the focal point of the classification. Wetlands are very dynamic systems and their functionality weighs high against the often rapid changes in their appearance, as could be seen from wetland butterfly studies (Terblanche *In prep*). In this

document the main guideline for the delineation and identification of wetlands where present is the practical field procedure for identification and delineation of wetlands by DWAF (2005).

The following sections highlight the materials and methods applicable to different aspects that were observed.

3.1 Classification of wetlands (SANBI: Ollis *et al.*, 2013)

3.1.1 System, regional setting and landscape unit (Levels 1, 2 and 3)

Three broad types of Inlands Systems are dealt with in the Classification System namely rivers, open waterbodies and wetlands. These Inland Systems are then classified according to a six-tiered structure that includes six levels.

At the systems level (Level 1) of wetland classification, a distinction is made between Marine, Estuarine and Inland ecosystems using the level of connectivity to the open ocean as discriminator of the biophysical character of each (Ollis *et al.*, 2013). Inland wetland systems are aquatic ecosystems with no no existing connection to the ocean (i.e. characterised by the complete absence of marine exchange and/ or tidal influence (Ollis *et al.*, 2013). In this case if any wetland is present it obviously qualifies as an Inland wetland system.

At Level 2 the regional setting is a spatial framework that is preferred by the investigator to allow for gaining an understanding of the broad ecological context within which an aquatic system occurs (Ollis *et al.*, 2013). A regional setting can be identified according to the DWA ecoregion classification of Kleynhans *et al.* (2005).

A distinction is made between four landscape units at Level 3 of the Classification System for Inland Systems on the basis of the landscape setting (i.e. topographical position) (Ollis *et al.*, 2013). Four landscape units are recognized: slope, valley floor, plain and bench.

3.1.2 Hydrogeomorphic units (Level 4)

Seven primary hydrogeomorphic (HGM) units are recognised for Inland Systems at Level 4A of the Classification System for Wetlands and other Aquatic Ecosystems in South Africa, on the

basis of hydrology and geomorphology (Ollis *et al.*, 2013). These are a River, Channeled valley-bottom wetland, Unchannelled valley-bottom wetland, Floodplain wetland, Depression, Seep and Wetland flat.

3.1.3 *Hydrological regime (Level 5)*

While the hydrogeomorphic unit (HGM) is influenced by the source of water and how it moves into, through and out of an Inland System, the hydrological regime (as categorised by the Classification System) describes the behaviour of the water within the system and, for wetlands, in the underlying soil (Ollis *et al.*, 2013). Together with the hydrogeomorphology the hydrological regime are used to describe the wetland as a functional unit (Ollis *et al.*, 2013). In the case of Inland wetlands which are classified as rivers, perenniality is an important characteristic to describe the hydrological regime. For Inland Systems other than rivers, five categories relating to the frequency and duration of inundation have been provided: Permanently inundated, Seasonally inundated, Intermittently inundated, Never inundated/ rarely inundated and unknown (Ollis *et al.*, 2013). Period of saturation within the upper 0.5 m of the soil is a very important discriminator that also links to the wetland delineation system of DWAF (2005). The following categories for saturation of wetland soils are recognised: Permanently saturated, Seasonally saturated, Intermittently saturated and unknown. These categories of period of saturation correspond to the permanent, seasonal and temporary zones of wetlands respectively.

3.1.4 *Wetland descriptors (Level 6)*

At Level 6 several “descriptors” are included for the structural/ chemical/ biological characterisation of Inland Systems (Ollis *et al.*, 2013). These descriptors are non-hierarchical to one another and can be applied in any order depending on the purpose of a study and the availability of information. Descriptors include natural vs. artificial, salinity, substratum type, pH, geology and vegetation cover (Ollis *et al.*, 2013). Various definitions are given for the descriptors which are likely to increase the consistency and use of the system.

3.2 Delineation of wetland

Together with terrain unit, indirect indicators of prolonged saturation by water: wetland plants (hydrophytes) and wetland (hydromorphic) soils are identified and used to delineate the wetland (DWAF 2005). Three zones, which may not all three be present in all wetlands, namely the permanent zone of wetness, the seasonal zone and the temporary zone are identified. The temporary zone is the outer zone and is saturated for only a short period of the year that is sufficient, under normal circumstances, for the formation of hydromorphic soils and the growth of wetland vegetation (DWAF 2005). Hydromorphic soils must display signs of wetness within 50cm of the soil to qualify as wetland soil that can support hydrophytic vegetation. Grid references and altitudes are taken on site with a GPS Garmin E-trex 20 ® instrument. Map information are analysed and depicted on Google images with the aid of Google Earth Pro (US Dept. of State Geographer, MapLink/ Tele Atlas, Google, 2012).

3.3 Vegetation at and near wetland

Though vegetation is a key component of the wetland definition in the Water Act, using vegetation as a primary indicator requires undisturbed conditions and expert knowledge (DWAF 2005). Modern wetland classification systems in South Africa therefore place more emphasis on the soil wetness indicators. It remains however, that plant assemblages undergo distinct changes in species composition from the centre of a wetland to the edge, and into adjacent terrestrial areas (DWAF 2005). This change in species composition of vegetation provides valuable clues for determining the wetland boundary and wetness zones (DWAF 2005).

Apart from botanical aspects which are integrated into the description of a wetland it is imperative to note the existence or not of threatened plant species or other plant species of conservation concern, such as near-threatened, data deficient or declining species at a wetland. Floristic composition is therefore also considered during the wetland assessment. Voucher specimens of plant species are only taken where the taxonomy is in doubt or where the plant specimens are of significant relevance for invertebrate conservation. Field guides such as those by Germishuizen (2003), Manning (2003), Manning (2009), Van Oudtshoorn (1999), Van Wyk (2000), Van Wyk & Malan (1998) and Van Wyk & Van Wyk (1997) were used to confirm the taxonomy of the species. Works on specific plant groups (often genera) such as those by Goldblatt (1986), Goldblatt &

Manning (1998), Jacobsen (1983), McMurtry, Grobler, Grobler & Burns (2008), Smit (2008), Van Jaarsveld (2006) and Van Wyk & Smith (2003) were also consulted to confirm the identification of species. An important source of identifications of plant species for the wetland survey is Van Ginkel, Glen, Gordon-Gray, Cilliers, Muasya & Van Deventer (2011). In this case no plant specimens were needed to be collected as voucher specimens or to be send to a herbarium for identification. For the most recent treatise of scientific plant names and broad distributions, Germishuizen, Meyer & Steenkamp (2006) or Raimondo *et al.* (2009) or updated lists on SANBI websites are followed to compile the lists of species.

3.4 Fauna at and near wetland

Species composition of fauna is not used in wetland characterization and assessments. However, it is important to note species that favour wetlands and especially whether threatened animal species are present at a wetland or not.

Mammals are noted as sight records by day. For the identification of species and observation of diagnostic characteristics Smithers (1986), Skinner & Chimimba (2005), Cillié, Oberprieler and Joubert (2004) and Apps (2000) are consulted. Sites are been walked, covering as many habitats as possible. Signs of the presence of mammal species, such as calls of animals, animal tracks (spoor), burrows, runways, nests and faeces are recorded. Walker (1996), Stuart & Stuart (2000) and Liebenberg (1990) are consulted for additional information and for the identification of spoor and signs. Trapping is only done if necessary. Habitat characteristics are also surveyed to note potential occurrences of mammals. Many mammals can be identified from field sightings but, with a few exceptions bats, rodents and shrews can only be reliably identified in the hand, and even then some species needs examination of skulls, or even chromosomes (Apps, 2000).

Birds are noted as sight records, mainly with the aid of binoculars (10x30). Nearby bird calls of which the observer was sure of the identity were also recorded. For practical skills of noting diagnostic characteristics, the identification of species and observation techniques Ryan (2001) is followed. For information on identification, biogeography and ecology Barnes (2000), Hockey, Dean & Ryan, P.G. (2005), Cillié, Oberprieler & Joubert (2004), Tarboton & Erasmus (1998) and Chittenden (2007) are consulted. Ringing of birds falls beyond the scope of this survey. Sites are walked, covering as many habitats as possible. Signs of the presence of bird species such as

spoor and nests are additionally been recorded. Habitat characteristics are surveyed to note potential occurrences of birds.

Reptiles are noted as sight records in the field. Binoculars (10x30) can also be used for identifying reptiles of which some are wary. For practical skills of noting diagnostic characteristics, the identification of species and observation techniques, Branch (1998), Marais (2004), Alexander & Marais (2007) and Cillié, Oberprieler and Joubert (2004) are followed. Sites are walked, covering as many habitats as possible. Smaller reptiles are sometimes collected for identification, but this practice was not necessary in the case of this study. Habitat characteristics are surveyed to note potential occurrences of reptiles.

Frogs and toads are noted as sight records in the field or by their calls. For practical skills of noting diagnostic characteristics, the identification of species and observation techniques Carruthers (2001), Du Preez (1996), Conradie, Du Preez, Smith & Weldon (2006) and the recent complete guide by Du Preez & Carruthers (2009) are consulted. CD's with frog calls by Carruthers (2001) and Du Preez & Carruthers (2009) are used to identify species by their calls when applicable. Sites are walked, covering as many habitats as possible. Smaller frogs are often collected by pitfall traps put out for epigeal invertebrates (on the soil), but this practice falls beyond the scope of this survey. Habitat characteristics are also surveyed to note potential occurrences of amphibians.

Invertebrates of which enough information is available to be integrated into an assessment, such as butterflies, are recorded as sight records, photographic records or voucher specimens. Voucher specimens are mostly taken of those species of which the taxa warrant collecting due to taxonomic difficulties or in the cases where species can look similar in the veldt. Many butterflies use only one species or a limited number of plant species as host plants for their larvae. Myrmecophilous (ant-loving) butterflies such as the *Aloeides*, *Chrysoritis*, *Erikssonia*, *Lepidochrysops* and *Orachrysops* species (Lepidoptera: Lycaenidae), which live in association with a specific ant species, require a unique ecosystem for their survival (Deutschländer & Bredenkamp, 1999; Terblanche, Morghental & Cilliers, 2003; Edge, Cilliers & Terblanche, 2008; Gardiner & Terblanche, 2010). Known food plants of butterflies are therefore also recorded. Other invertebrate groups such as fruit chafer beetles and mygalomorph spiders are also investigated where relevant.

3.5 Present Ecological Status

Ecological status of wetlands are based on models such as the modified Habitat Integrity approach developed by Kleynhans (1996, 1999). Present ecological status PES methodology is then largely based on criteria for assessing the habitat integrity of floodplain wetlands and notes for allocating a score to attributes and rating the confidence level associated with each score (DWAF 1999). Such criteria are selected on the assumption that anthropogenic modification can generally be regarded as the primary causes of degradation of the ecological integrity of a wetland (see DWAF 1999). This is done by using Table W4-1 given by DWAF (1999):

- Score each attribute according to the guidelines provided in the footnote.
- Calculate a mean score for Table W4-1 using the individual scores for all attributes.
- Provide a confidence rating for each score according to the guidelines provided in the footnote to indicate the areas of uncertainty in the determination.

Table W4-2 provides guidelines for the determination of the Present Ecological Status Class (PESC), based on the mean score determined for Table W4-1. If any of the attributes scores < 2 (i.e., it is considered to be seriously or critically modified) this score and not the mean should be taken into consideration. This approach is based on the assumption that extensive degradation of any of the wetland attributes may determine the Present Ecological Status Category (PESC). In any case, the mean on which the assessment of the PESC is based should be regarded as a guideline and should also be tested against the opinion of local experts (DWAF 1999).

Biological integrity is not directly estimated through this approach though in some systems or parts of systems, information on biological integrity is available. In such cases, the information on biological integrity can be used as a check of the PES Category determination. The mean is used to relate the ecological state of the wetland to a particular PES Category (Table W4-2) (DWAF 1999).

3.6 Ecological Importance and Sensitivity

The assessment of the ecological importance and sensitivity is according to DWAF (1999) which in turn is adapted from Kleynhans (1996) and Kelynhans (1999). "Ecological importance" of a water resource is an expression of its importance to the maintenance of ecological diversity and functioning on local and wider scales. "Ecological sensitivity" refers to the system's ability to resist

disturbance and its capability to recover from disturbance once it has occurred. The Ecological Importance and sensitivity (EIS) provides a guideline for determination of the Ecological Management Class (EMC) DWAF (1999).

In the method outlined here, a series of determinants for EIS according to Table W5-1 of DWAF (1999) are assessed on a scale of 0 to 4, where 0 indicates no importance and 4 indicates very high importance. The method is used as a guideline for the professional judgement of individuals familiar with an area and its wetlands. The assessors must substantiate and document their judgement as far as possible for future reference and revision (DWAF 1999).

3.7 Limitations

Wetlands are very dynamic systems and owing to time constraints a snapshot of conditions at wetlands are taken, even though the hydrogeomorphological setting, soil wetness characteristics and established vegetation constitute some longer term features of a wetland. For each site visited, it should then be emphasized that surveys can by no means result in an exhaustive list of wetland plants and animals present on the site, because of the time constraint. The on site survey was conducted during May 2013 and July 2013 which is a suboptimal time of the year to find many of the habitat sensitive animal species of high conservation priority. Weather conditions during the survey were favourable for recording fauna and flora. The focus of the survey remains a habitat survey that concentrates on the hydrogeomorphological, hydrological and additional descriptors to classify and assess the wetland.

4 RESULTS AND DISCUSSION

4.1 Assessment and classification of wetlands at the site

4.1.1 Watercourse and riparian zone at the site

A watercourse is present at the south western part of the site which could be defined as a small non-perennial tributary. A river is a “lotic” aquatic ecosystem with flowing water concentrated within a distinct channel, either permanently or periodically (Ollis *et al.*, 2013). This watercourse is present at a very shallow valley (almost a plain). The small non-perennial river consists of an active channel with a riparian zone that is characterised by indigenous tree species of which *Acacia karroo* (sweet thorn) is most conspicuous but which also includes *Euclea crispa* (blue ghwarrie), *Gymnosporia buxifolia*, *Searsia lancea* (karee) and *Ziziphus mucronata* (buffalo-thorn).

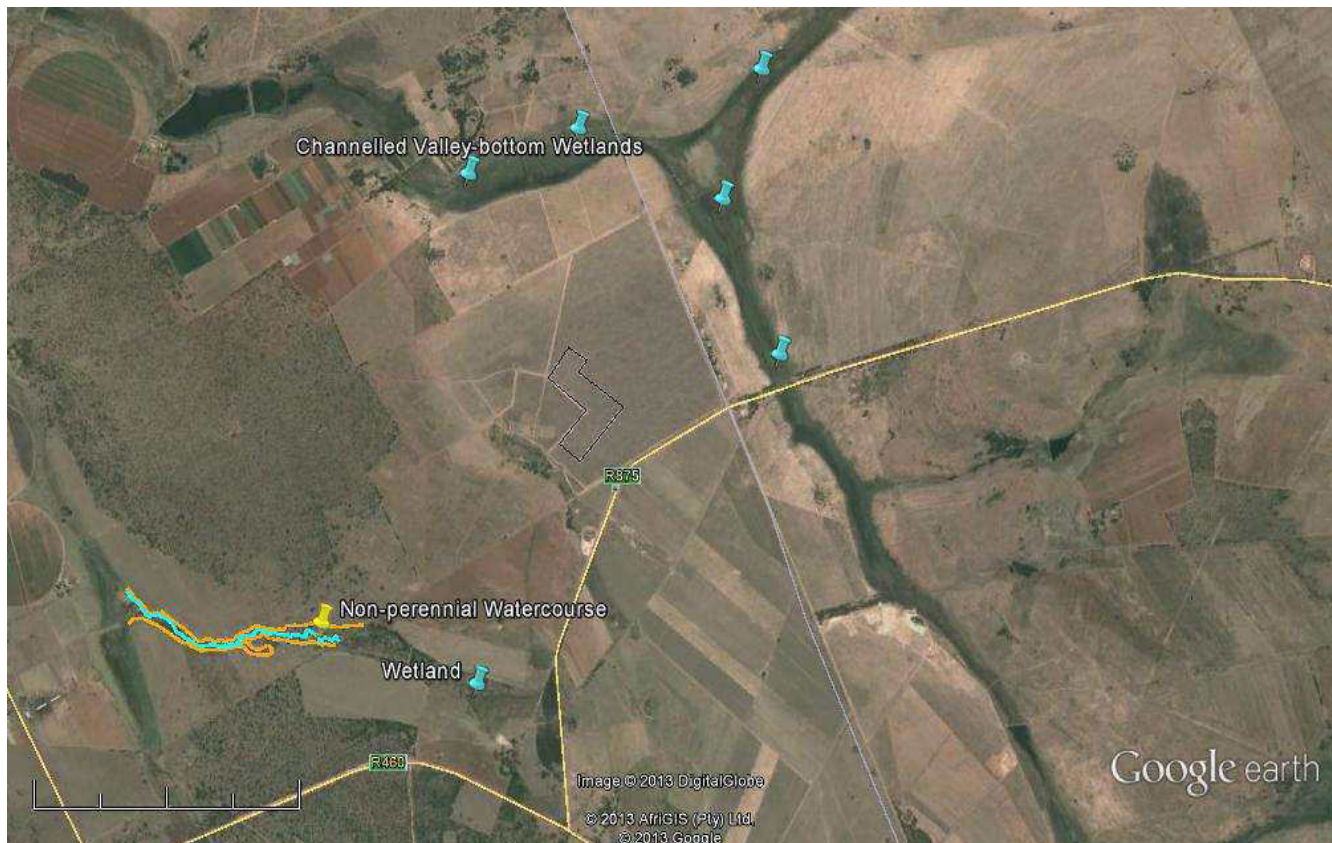


Figure 1 Larger area that includes Mlekis Beef.

Grid references and altitudes were taken at site with a GPS Garmin E-trex 20 ® instrument. Map information were analysed and depicted on Google Earth Pro (US Dept. of State Geographer, MapLink/ Tele Atlas, Google, 2013, licenced software bought by the author).



Photo 1 Watercourse that crosses south-western part of the site. Riparian zone vegetation is characterised by conspicuous concentrations of *Acacia karroo* (sweet thorn) and other indigenous tree species.
Photo: July 2013, R.F. Terblanche.



Photo 2 Edge of active channel and banks of the small tributary that crosses the south western part of the site.
Photo: R.F. Terblanche.



Figure 2 Watercourse, that crosses the south western part of the site, with riparian zones.

Orange lines: Outer limits of the riparian zone.

Blue lines: An indication of the water course.

Grid references and altitudes were taken at site with a GPS Garmin E-trex 20 ® instrument.

Map information were analysed and depicted on Google images with the aid of Google Earth Pro (US Dept. of State Geographer, MapLink/ Tele Atlas, Google, 2013; licenced software bought by author).

The watercourse and riparian zone is small and technically a recurrent stream or non-perennial tributary that is probably only active after substantial rainfall events. At some small area where the water is attenuated and the channel widens small permanent wetland zones with *Typha capensis* (bulrush) have formed at the south western extreme of the site.

A 100 m buffer zone from the edge of the riparian zone of this small tributary should apply (GDARD, 2012). This tributary at the south western part of the site is part an important conservation corridor and its healthy condition is also important for the integrity of the wetlands and rivers downstream.

4.1.2 Wetlands in the larger area outside the site

Channelled valley-bottom wetlands are present outside (=> 200 m) the site and property. The site and property falls outside the designated 50 m buffer zone (GDARD, 2012) of the suspected outer edge of these channelled valley-bottom wetlands. These wetlands are unlikely to be directly affected by the proposed development. However, because the site proposed for the development is elevated and within 500 m from these wetlands and tributaries of the Elands river, pre-cautionary measures should apply to limit any indirect effects the proposed development may have on these lower lying wetlands and tributaries.

Wetlands outside the site are part of a FEPA; a Freshwater Ecosystem Priority Area identified on a national scale (Nel *et al.*, 2011a; 2011b). Freshwater ecosystems priority areas need to stay in good condition (natural, largely natural) in order to protect freshwater ecosystems and protect water resources for human use. Any FEPA identified nationally should be maintained in a good condition by good planning, decision-making and management to ensure human impact does not impact on the condition of the ecosystem (Nel *et al.*, 2011a; 2011b). These wetland FEPAs near Mlekis Beef is part of the Olifants Water Management Area and the Middle Olifants Sub-water Management System (Nel *et al.*, 2011a; 2011b).

Because these wetlands fall well outside the site they have not been classified further, but because they are priority and could indirectly be influenced by the development they have been noted here with the aim of putting important pre-cautionary and mitigation measures in place, if the development is approved.

5 MITIGATION AND PRE-CAUTIONARY MEASURES

Feedlots comprise intensive beef-production systems which could produce an excess of manure and other associated wastes. Ecosystems at or near the feedlots may suffer to absorb excess manure being produced by feedlots. Higher concentrations of nitrogen and phosphorous are involved in the nutrient cycles associated with feedlots. Manure that cannot be absorbed and processed by the soil has to be treated and disposed of in a way to avoid contaminating water and land (soil). If the high concentration of organic wastes associated with feedlots could not be properly processed it could lead to the pollution of soil and water resources. In aquatic systems excess of organic wastes causes eutrophication (nutrient enrichment) of these water systems and subsequently algal blooms that in turn could kill aquatic life. High concentration of nitrates should not be allowed to seep into the groundwater and overall the possibility that excess nutrients infiltrate into groundwater should be distinctly reduced.

Nature and content of water runoff from feedlots are important to consider because of the impacts water runoff from feedlots may have on surface water and ground water at watercourses and wetlands nearby.

The following mitigation measures apply:

- Measures to limit and control water runoff and especially water containing high concentrations of nutrients or waste, are imperative.
- If retention ponds are part of the development regular monitoring should take place to prevent leakages and overflows. Retention ponds should be engineered by a qualified person.
- Cleaning and properly planned disposing of waste is of utmost importance. A sound manure management plan must be constructed so that excess manure produced by the feedlot can be applied at reasonable agronomic rates at depositories (overapplication should be avoided and depositories carefully planned).
- The manure management plan and application must include proper planning of the location and nature of manure stockpiles.
- If the development is accompanied by the construction of any pits these should be well-lined with for example reinforced concrete or any other appropriate impermeable lining.

- If any barns are part of the development should be constructed in such a way that the least possible manure or waste come into contact with water runoff or the soil.
- Any containers used to store or carry waste should be made of material that does not allow for waste leaking or coming into contact with water runoff or the soil.
- Any storm water or water runoff systems of the development should be planned in such a way that the least possible pollution of wetlands or water courses near or at the site should take place.

6 CONCLUSION

No wetlands are present at the footprint allocated for the development. A tributary with a riparian zone crosses the south western part of the site and property. This tributary and riparian zone is in a fairly natural state and an important conservation corridor. Conserving the ecological good condition of the tributary and riparian zone is also important for wetland and river health downstream. A 100 m buffer zone from the edge of the riparian zone should be designated (GDARD, 2012).

Substantial wetlands, that also have been identified as FEPAs (Freshwater Ecosystem Priority Areas) on a national scale exist outside the site and more than 50 m, i.e. outside designated buffer zones (GDARD, 2102). Because parts of these wetlands are within 500 m from the site some imperative pre-cautionary measures apply which have been outlined in Section 5. These mitigation measures aim to avoid or limit the contact of waste and excess manure with surface water, groundwater and ultimately the wetland system to an acceptable minimum.

There are no threatened animal or plant species (or any other species of particular known conservation concern) that could be associated with wetlands resident at the site.

It is anticipated that if mitigation measures are applied properly, the proposed development would not have a major influence on the hydrological regime and ecological condition of wetlands outside the site as well as the watercourse or tributary that crosses the south western extreme of the site.

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Vegetation Assessment



Appendix G3

LEBOMBO GARDEN BUILDING
36 LEBOMBO ROAD
ASHLEA GARDENS
0081

P.O. BOX 11375
MAROELANA
0161

Tel: (012) 346 3810
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Vegetation Assessment Report

Mlekis Cattle Feedlot

June 2013



Report Author: Mary-Lee Potgieter (Cand.Sci.Nat, M.Sc)
Report Reviewer: Lizande Kellerman (Pri.Sci.Nat, M.Sc)

Declaration

I, Mary-Lee Potgieter, declare that -

- I act as the independent specialist in this application;
- I am dedicated to biodiversity and environmental management nevertheless along with that I understand the economical and social needs for various future developments;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have not, and will not engage in, conflicting interests in the undertaking of the activity;
- I realise that a false declaration is an offence in terms of Regulation 71 and is punishable in terms of section 24F of the National Environmental Management Act (Act No 107 of 1998).

M Potgieter

Signature

BOKAMOSO LANDSCAPE ARCHITECTS & ENVIRONMENTAL CONSULTANTS CC

Name of company

JUNE 2013

Date



Declaration

I, Lizande Kellerman, declare that in my professional opinion –

- The specialist responsible for this floristic study and compilation of this report performed her duties to the best of her intellectual ability and knowledgeable experience;
- The information contained in this report is validated and reflects true to the situational analysis conducted on site;
- The report suffices for inclusion in an environmental impact assessment report supporting an application process for environmental authorisation.



Signature

COUNCIL FOR SCIENTIFIC AND INDUSTRIAL RESEARCH

Name of company

25 AUGUST 2013

Date



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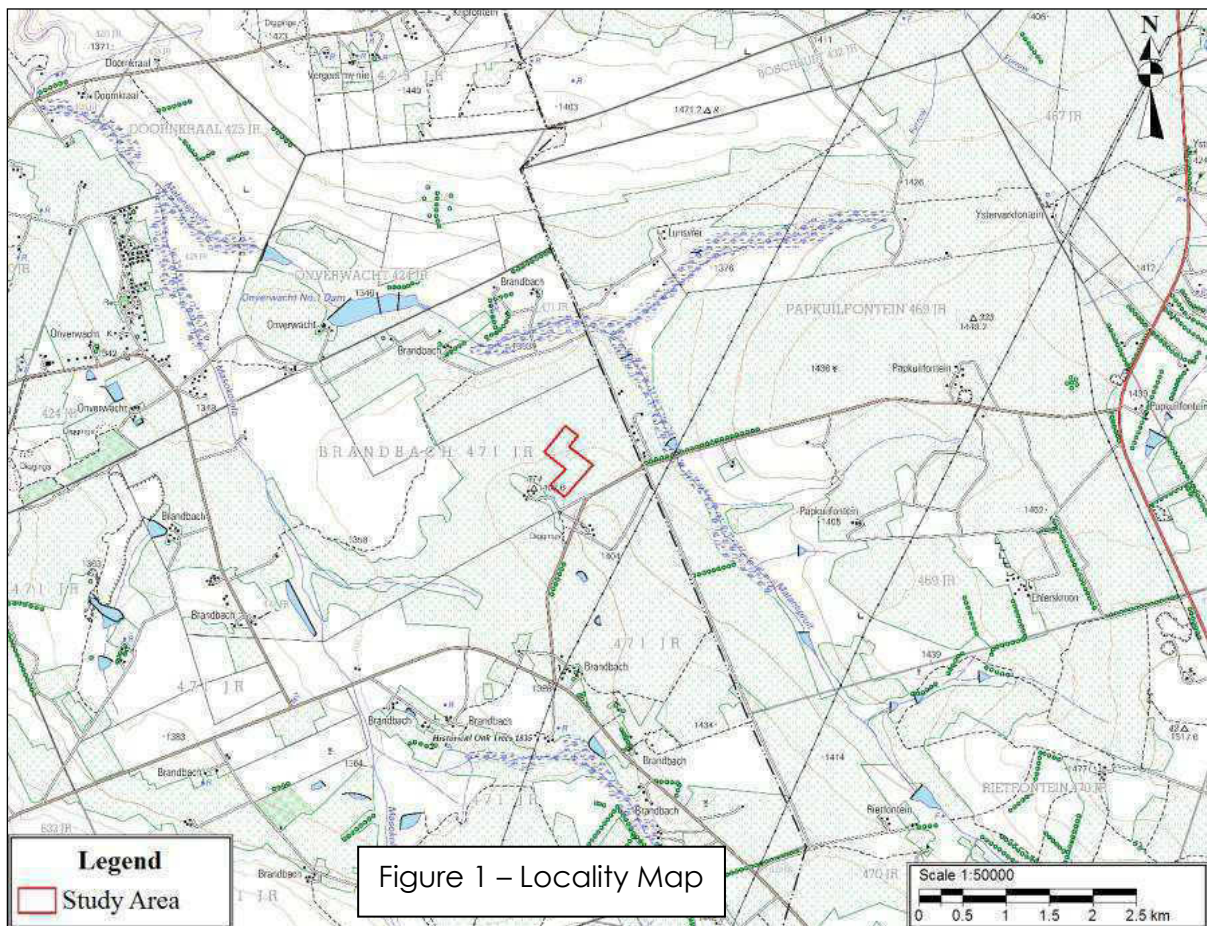
Table 1	Plant species identified	7
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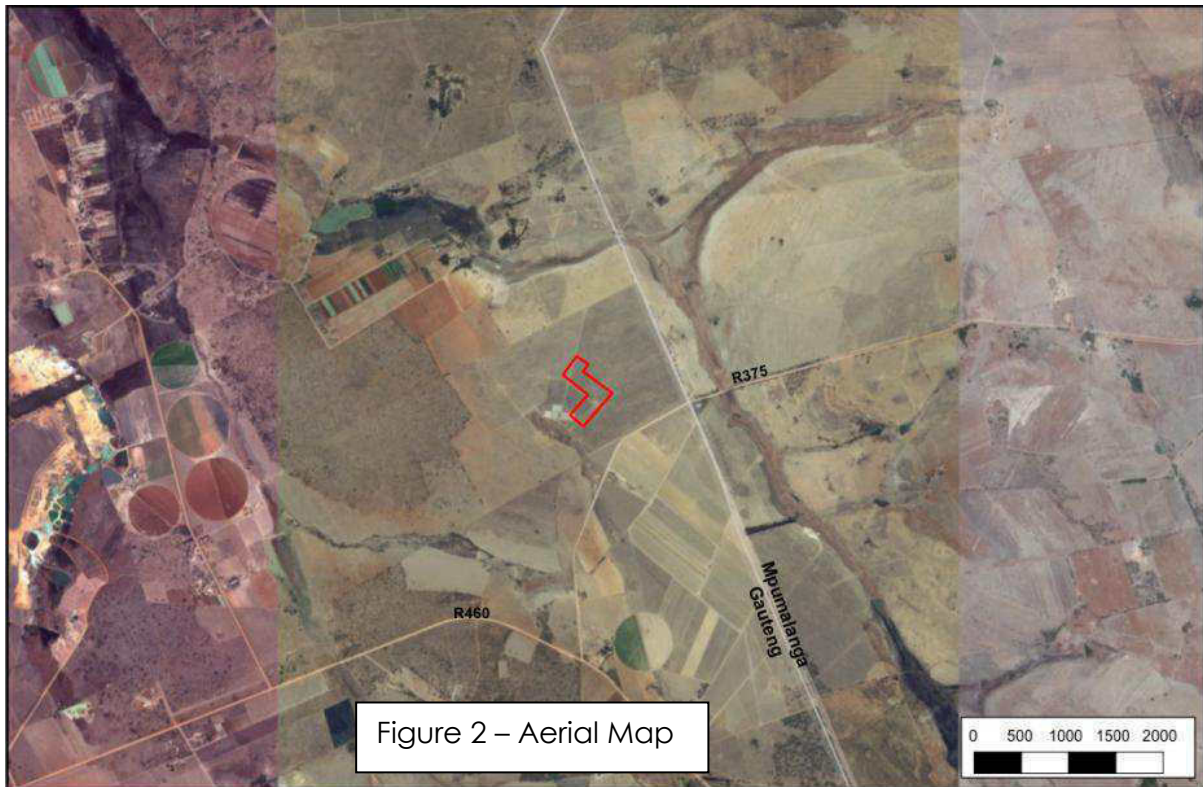


1. INTRODUCTION

Bokamoso Landscape Architects & Environmental Consultants was appointed by **Mlekis Beef** as Environmental Consultants and specialists to conduct a vegetation study on part of Portion 47 of the farm Brandbach 471 JR, Cullinan. The site visit was conducted on the 6th of May, 2013.

The proposed site is situated 14 km east of Cullinan, adjacent to the R875 (**Please refer to Figure 1- Locality Map and Figure 2- Aerial Map**). The study area is approximately 19.6 hectares in extent and falls under the jurisdiction of the City of Tshwane Metropolitan Municipality.





The study site is dominated by old cultivated fields which provided the opportunity for introducing some alien and invasive plant species into the area. Cattle grazing are present on the study area contributing to the presence of alien and invasive species as well as the presence of species known to occur in over-utilised areas. The presence of alien and invasive plant species is a result of overgrazing in the past. The entire study site is a homogeneous vegetation type with little to no variation in species composition across the site. The vegetation is characterised by grass and forb species, with almost no woody plants present. The methodology used to survey the homogenous floristic composition of the study site entailed walking several transects criss-crossing the entire site.

Terms of Reference

The terms of reference for the current flora study were as follow:

- ***To determine the presence of red data plant species***
- ***To give an overview, in terms of the flora, for the proposed development site***

2. ENVIRONMENTAL BACKGROUND

Cullinan receives on average 572 mm per year with the majority of rain falling during the summer months. The highest rainfall occurs in December with an average of 105 mm; while June has the lowest rainfall with an average of 0 mm (SA Explorer 2013).

The summer months can generally be described as moderate to warm with an average maximum midday temperature of 27.2°C for the month of January in Cullinan. The minimum night temperatures for January are 15°C. The winters are cool to moderate with a maximum midday temperature in June of 18.2°C and a minimum night temperature of 2.1°C in July (SA Explorer 2013).

The study area site is situated in the quarter degree grid cell 2528DA which has been classified as Central Sandy Bushveld, sandy plains with woodland habitat where the soil is deep and sandy and on certain areas shallow and gravelly. This grasslands falls within a warm-temperature summer-rainfall region with high summer temperatures and severe frequent winter frosts. This vegetation unit is considered vulnerable. Its conservation target is 19% with small parts of this unit conserved in statutory reserves and few private conservation areas. Almost 25% of the unit is already transformed by cultivation and urbanization (Mucina and Rutherford, 2006) (***Please refer to Figure 3 - Vegetation Map***).

Land uses in the surrounding area are described as agriculture, including livestock farming and cultivation.

3. METHODS

A desktop study was conducted to determine the Red Listed plant species that are likely to occur on the study area. A plant species list was retrieved from the Plants of Southern Africa – an online checklist - for the quarter degree grid cell 2528DA (<http://posa.sanbi.org>, May 2013, Grid reference: 2528DA).



According to databases and satellite images, the following could be determined:

- The study area does not fall into any protected areas
- No species of concern on the study area according to the GDARD C-Plan
(Refer to Figure 4)
- No rivers or wetlands transect the proposed development site **(Refer to Figure 5)**

The site visit was conducted on 6 May 2013 to determine whether any of the Red Listed plant species occur on the proposed development site. The vegetation on the study area was identified as a homogeneous unit since it is considered similar in vegetation structure and composition.

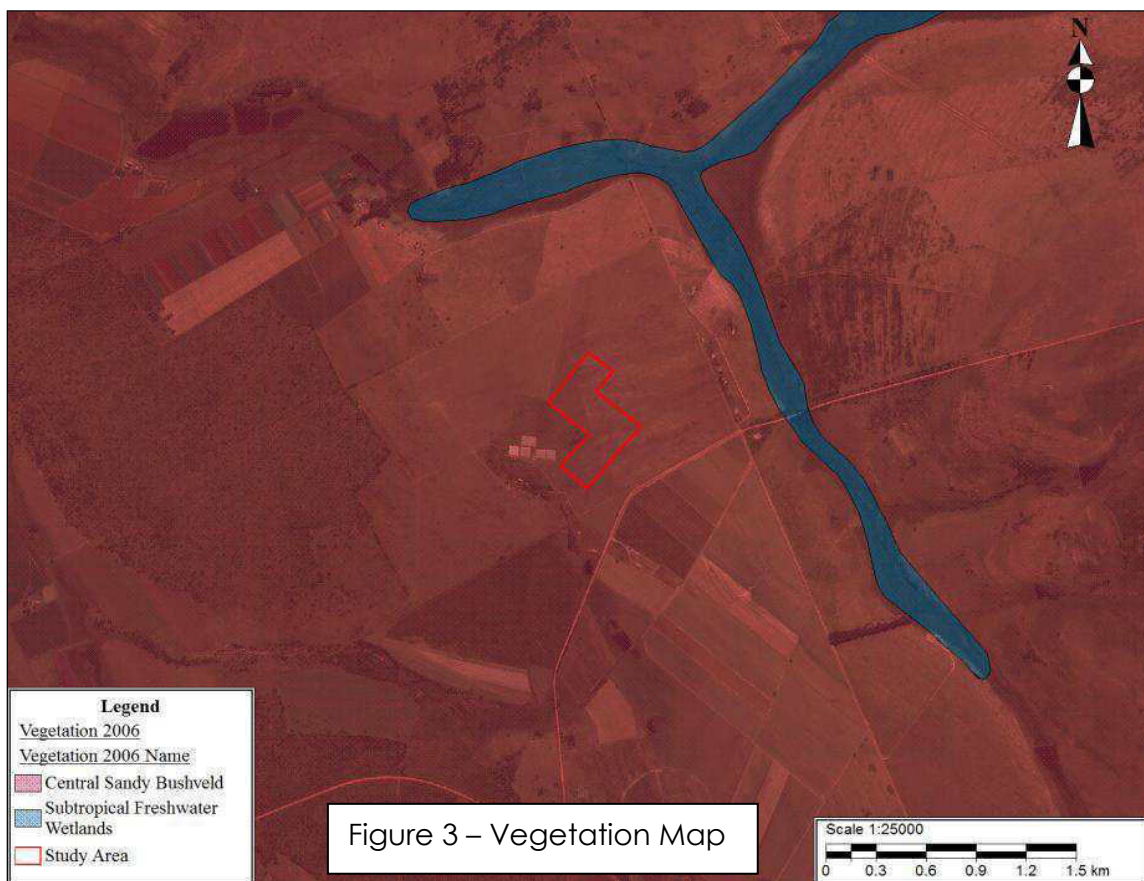
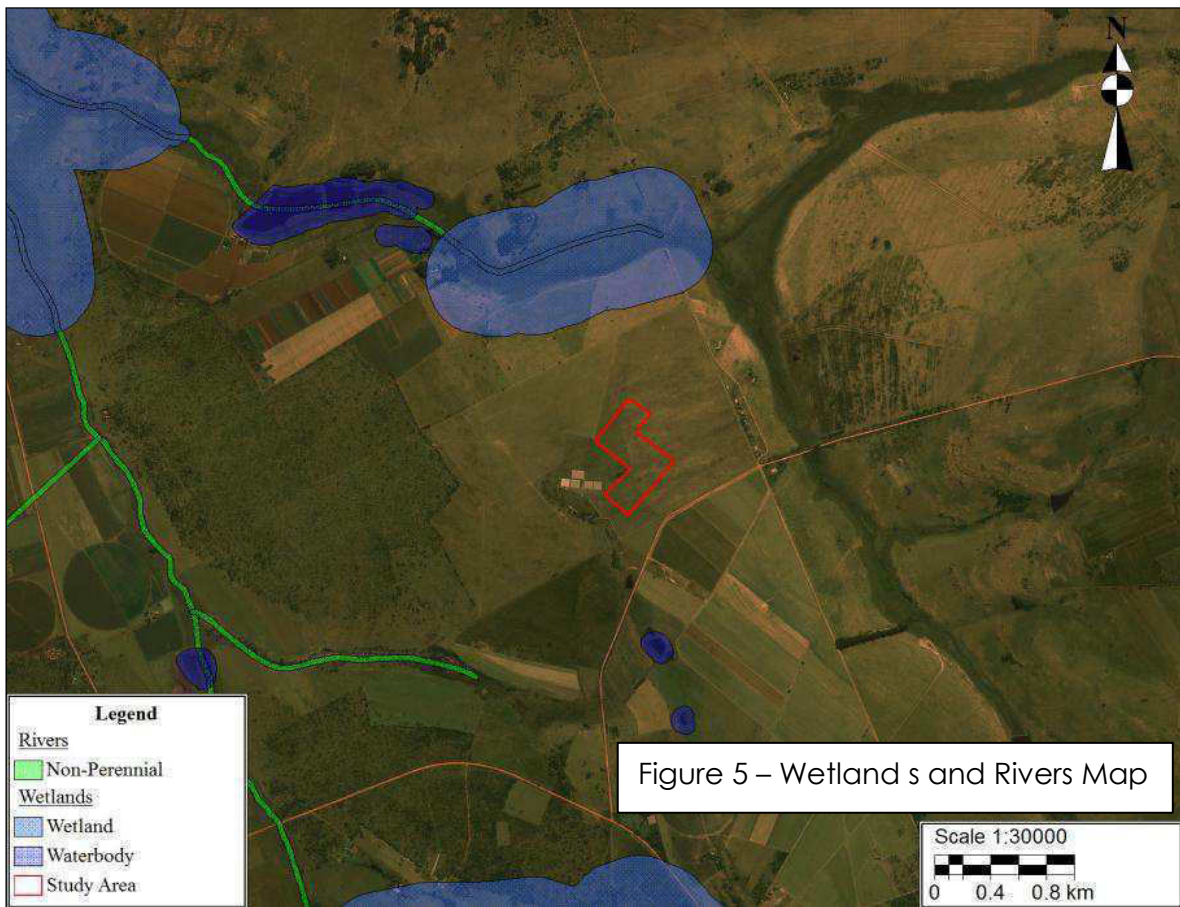
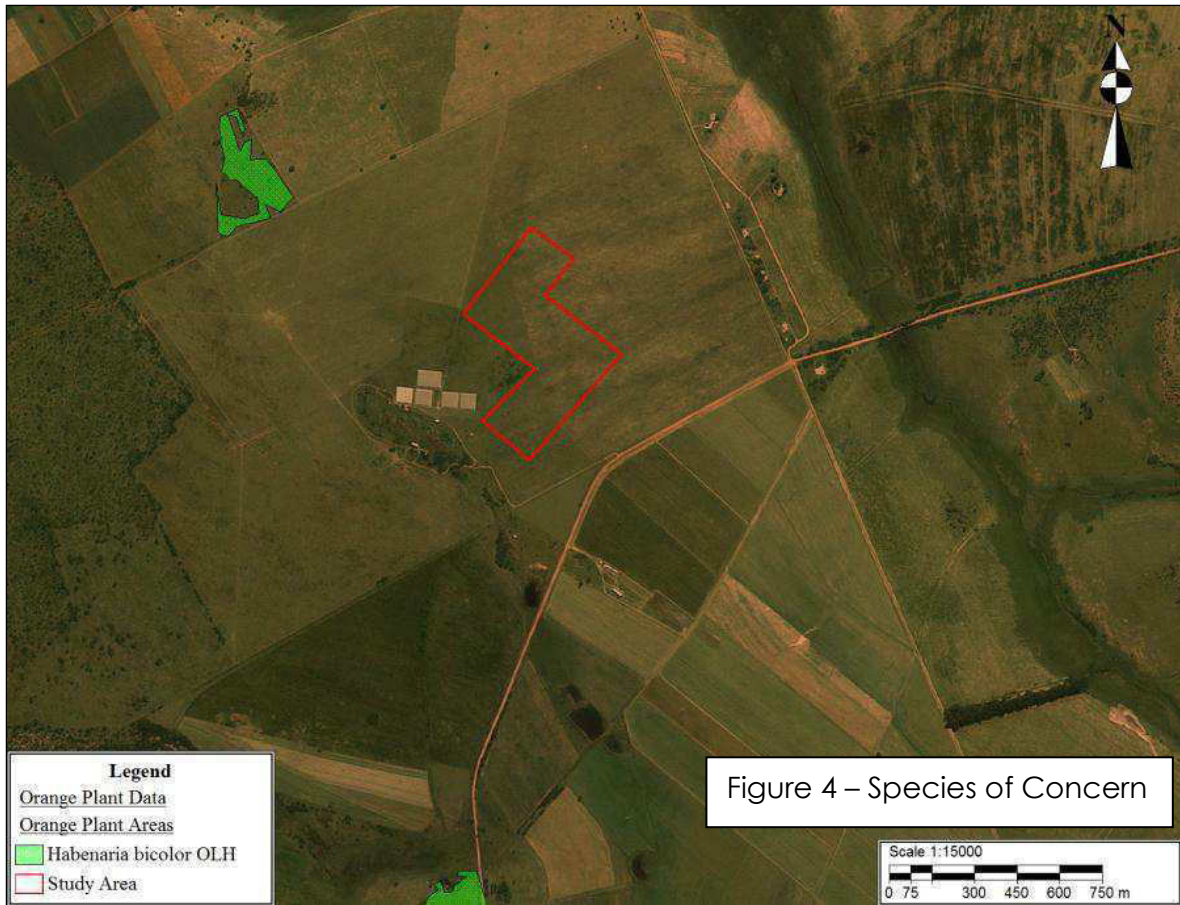


Figure 3 – Vegetation Map



4. RESULTS

During the site visit on 6 May 2013, no red data plant species were identified. According to Plants of Southern Africa – an online checklist - eight red data species occur within the quarter degree grid cell 2528DA (<http://posa.sanbi.org>, May 2013, Grid reference: 2528DA). None of these eight species are endemic to South Africa. In Table 1 the plant species identified during the surveyed are listed. All alien plant species or known invaders are marked with an asterisk.

The area was originally described as sandy bushveld before agricultural activities transformed the natural state of the study area.



Table 1. Plant species identified

GRASSES:

Aristida adscensionis
Aristida stipitata
Aristida congesta subsp. *congesta*
Brachiara serata
Cenchrus ciliaris
Cymbopogon excavatus
Diheteropogon amplectens
Digitaria eriantha
Eragrostis lehmanniana
Eragrostis rigidior
Melinis repens
Perotis patens
Pogonarthria squarrosa
Schizachyrium sanguineum
Seriphium plumosum
Sporobolus africanus
Tricholaena monachne

HERBS/FORBS:

Asclepias spp.
*Bidens formosa**
*Bidens pilosa**
Chamaechrista mimisoides
Cleome rubella
*Conyza bonariensis**
Helichrysum coriaceum
Leonotis microphylla
Pelargonium dolomiticum
Pollichia campestris
Sesamum alatum
*Tagetes minuta**
Tephrosia spp.



*Verbena bonariensis**

Vernonia poskeana

*Zinnia peruviana**

SHRUBS/TREES:

Acacia mearnsii

5. MITIGATION MEASURES

Loss of vegetation and adversely impacting the surrounding natural environment

During the construction phase of the Mlekis Beef Feedlot, vegetation will be cleared where permanent structures are to be erected. The construction team should be alert for the possible occurrence of Red Listed plant species even though no Red Listed plant species were found during the assessment. A photo guide of possible red data species should be given to the construction team to make sure they are able to identify such species.

The following mitigation measures are proposed:

- As far as possible all large indigenous trees should remain intact and must be excluded from development. If protected tree species are present within the area of development a permit should be obtained to relocate such protected species.
- During clearance of the development site, the minimum area necessary for the feedlot and associated infrastructure should be cleared of vegetation.
- Construction workers should be cautious for Red Listed plant species when clearing the site and if it is thought that a Red Listed plant species is present on the site a Vegetation Specialist should be contacted. The Environmental Control Officer (ECO) can assist with such identification and ensure that the mitigation measures as per the EMP are implemented.
- After construction the natural vegetation should be rehabilitated in order to enhance the growth of natural vegetation towards the rest of the farm.
- Rehabilitation processes should involve indigenous plant species only.
- Cement should only be mixed in designated areas.



- Any spillages, whether cement or diesel, should be reported to the environmental officer on site, cleared immediately. An oil spill kit should be kept on site and used when required.
- Spills should be cleaned up immediately by removing the spills together with the polluted soil and disposing thereof at a registered facility.
- The areas chosen for the stockpiling of materials such as gravel, concrete and soil should be of minimum size and it should involve the least disturbance to vegetation.
- Suitable covered containers should be provided and conveniently placed for waste disposal. All used oils, grease or hydraulic fluid should be placed therein and these containers should be removed from the site on a regular basis for disposal at a registered facility.

Introduction of alien and invasive species

Disturbance events lead to the destruction of the internal competition between the originally occurring plant species. Areas that have been stripped of vegetation open a window of opportunity for alien and invasive species to enter the ecosystem and successfully establish themselves. The construction vehicles and other machinery to be used during construction may also lead to seeds from other sites being transported to the study area. It is important to identify all the possible sources of alien species and to realise all of the implications of the workers and construction implements as well as construction vehicles (tractors) on the introduction of alien species so that these can be mitigated accordingly.

The following mitigation measures are proposed:

- For alien species the best mitigation will be a proper monitoring programme that will detect the presence of alien species and when they have been identified, an eradication scheme can be initiated.
- An eradication programme of alien plant invasions could be by means of mechanical, chemical or biological control. Habitat management and Integrated Pest Management (IPM) are additional methods often used for alien invasion control.
- The particular method chose for the eradication programme depends on the extent of the problem.



6. CONCLUSION AND RECOMMENDATIONS

No red listed plants were identified during the floristic assessment. The site inspection was conducted towards the end of autumn and very little of the plants were flowering, resulting in difficult identification. It is especially difficult to identify red data species without their inflorescences. It is recommended that a Vegetation Specialist should survey the site again **before** site clearance commences to establish whether any Red Listed plant species occur within that designated area.

The broader vegetation type is considered vulnerable according to Mucina and Rutherford (2006) and therefore it was assigned a medium sensitivity level. However, the previous and current land-use activities such as cultivation and cattle grazing decrease the sensitivity of the study area as it has been transformed from its natural state. This is evident from the percentage of alien and invasive species as well as the current species composition compared to that described in Mucina and Rutherford (2006).

The proposed development corresponds with the current and surrounding land uses and the position and size of the study area will not break the connectivity of the vegetation type.

It is recommended that the area is properly demarcated prior to the commencement of construction in order to reduce the disturbance of vegetation outside the proposed development area. Additionally, it is recommended that mitigation measures should form part of the Environmental Management Plan (EMP).



7. REFERENCES

MUCINA, L, & RUTHERFORD, M.C. (Eds.) 2006. The vegetation of South Africa, Lesotho and Swaziland. Strelitzia 19. South African National Biodiversity Institute, Pretoria

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8. ANNEXURE

Annexure A

Plant species according to the Grid 2528DA

Family	Species	Threat status	SA Endemic	Lifecycle	Growth forms
MESEMBRYANTHEMACEAE	<i>Frithia humilis</i> Burgoyne	EN	No	Perennial	Succulent
ANACARDIACEAE	<i>Searsia gracillima</i> (Engl.) Moffett var. <i>gracillima</i>	NT	No	Perennial	Dwarf shrub
APOCYNACEAE	<i>Stenostelma umbelluliferum</i> (Schltr.) S.P.Bester & Nicholas	NT	No	Perennial	Geophyte, herb, succulent
CRASSULACEAE	<i>Adromischus umbraticola</i> C.A.Sm. subsp. <i>umbraticola</i>	NT	No	Perennial	Dwarf shrub, lithophyte, succulent
FABACEAE	<i>Argyrobium megarrhizum</i> Bolus	NT	No	Perennial	Dwarf shrub, shrub
ORCHIDACEAE	<i>Habenaria bicolor</i> Conrath & Kraenzl.	NT	No	Perennial	Geophyte, herb
AQUIFOLIACEAE	<i>Ilex mitis</i> (L.) Radlk. var. <i>mitis</i>	Declining	No	Perennial	Shrub, tree
HYACINTHACEAE	<i>Drimia altissima</i> (L.f.) Ker Gawl.	Declining	No	Perennial	Geophyte, succulent
ACANTHACEAE	<i>Barleria elegans</i> S.Moore ex C.B.Clarke	LC	No	Perennial	Herb, shrub
ACANTHACEAE	<i>Crabbea hirsuta</i> Harv.	LC	No	Perennial	Herb

ACANTHACEAE	<i>Crossandra greenstockii</i> S.Moore	LC	No	Perennial	Dwarf shrub, herb
ACANTHACEAE	<i>Justicia anagalloides</i> (Nees) T.Anderson	LC	No	Perennial	Herb
AMARANTHACEAE	<i>Aerva leucura</i> Moq.	LC	No	Perennial	Herb
AMARANTHACEAE	<i>Amaranthus thunbergii</i> Moq.	LC	No	Annual	Herb
AMARANTHACEAE	<i>Kyphocarpa angustifolia</i> (Moq.) Lopr.	LC	No	Annual	Herb
AMARYLLIDACEAE	<i>Crinum graminicola</i> I.Verd.	LC	No	Perennial	Geophyte
ANACARDIACEAE	<i>Ozoroa paniculosa</i> (Sond.) R.& A.Fern. var. <i>paniculosa</i>	LC	No	Perennial	Shrub, tree
ANACARDIACEAE	<i>Sclerocarya birrea</i> (A.Rich.) Hochst. subsp. <i>caffra</i> (Sond.) Kokwaro	LC	No	Perennial	Tree
ANACARDIACEAE	<i>Searsia gracillima</i> (Engl.) Moffett var. <i>glaberrima</i> (Schönland) Moffett	LC	No	Perennial	Dwarf shrub
ANTHERICACEAE	<i>Chlorophytum recurvifolium</i> (Baker) C.Archer & Kativu	LC	No	Perennial	Herb
APIACEAE	<i>Afroscidium magalimontanum</i> (Sond.) P.J.D.Winter	LC	No	Perennial	Herb
APIACEAE	<i>Centella asiatica</i> (L.) Urb.	LC	No	Perennial	Climber, herb
APOCYNACEAE	<i>Ancylobotrys capensis</i> (Oliv.) Pichon	LC	No	Perennial	Climber, shrub
APOCYNACEAE	<i>Asclepias albens</i> (E.Mey.) Schltr.	LC	No	Perennial	Herb
APOCYNACEAE	<i>Asclepias densiflora</i> N.E.Br.	LC	No	Perennial	Herb
APOCYNACEAE	<i>Asclepias fallax</i> (Schltr.) Schltr.	LC	No	Perennial	Herb
APOCYNACEAE	<i>Aspidoglossum biflorum</i> E.Mey.	LC	No	Perennial	Herb, succulent
APOCYNACEAE	<i>Aspidoglossum restioides</i> (Schltr.) Kupicha	LC	No	Perennial	Herb, succulent
APOCYNACEAE	<i>Brachystelma rubellum</i> (E.Mey.) Peckover	LC	No	Perennial	Geophyte, succulent
APOCYNACEAE	<i>Cryptolepis oblongifolia</i> (Meisn.) Schltr.	LC	No	Perennial	Scrambler, shrub
APOCYNACEAE	<i>Diplorhynchus condylocarpon</i> (Müll.Arg.) Pichon	LC	No	Perennial	Shrub, tree
APOCYNACEAE	<i>Gomphocarpus fruticosus</i> (L.) Aiton f. subsp. <i>decipiens</i> (N.E.Br.) Goyder & Nicholas	LC	No	Perennial	Herb, shrub
APOCYNACEAE	<i>Gomphocarpus glaucophyllus</i> Schltr.	LC	No	Perennial	Herb
APOCYNACEAE	<i>Gomphocarpus rivularis</i> Schltr.	LC	No	Perennial	Herb, shrub
APOCYNACEAE	<i>Pentarrhinum insipidum</i> E.Mey.	LC	No	Perennial	Climber Geophyte, herb, succulent
APOCYNACEAE	<i>Raphionacme velutina</i> Schltr.	LC	No	Perennial	Succulent, tree
ARALIACEAE	<i>Cussonia paniculata</i> Eckl. & Zeyh. subsp. <i>sinuata</i> (Reyneke & Kok) De Winter	LC	No	Perennial	Shrub
ASPARAGACEAE	<i>Asparagus flavicaulis</i> (Oberm.) Fellingham & N.L.Mey. subsp. <i>flavicaulis</i>	LC	No	Perennial	Herb, succulent
ASPHODELACEAE	<i>Aloe greatheadii</i> Schönland var. <i>davyana</i> (Schönland) Glen & D.S.Hardy	LC	No	Perennial	Herb, succulent
ASPHODELACEAE	<i>Chortolirion angolense</i> (Baker) A.Berger	LC	No	Perennial Annual (occ. perennial)	Geophyte, succulent
ASTERACEAE	<i>Conyza ulmifolia</i> (Burm.f.) Kuntze	LC	No	Perennial	Herb

ASTERACEAE	<i>Denekia capensis</i> Thunb.	LC	No	Perennial	Herb
ASTERACEAE	<i>Dicoma anomala</i> Sond. subsp. <i>gerrardii</i> (Harv. ex F.C.Wilson) S.Ortiz & Rodr.Oubiña	LC	No	Perennial	Herb
ASTERACEAE	<i>Dimorphotheca spectabilis</i> Schltr.	LC	No	Perennial Annual (occ. perennial)	Herb
ASTERACEAE	<i>Felicia mossamedensis</i> (Hiern) Mendonça	LC	No	Perennial	Shrub
ASTERACEAE	<i>Felicia muricata</i> (Thunb.) Nees subsp. <i>muricata</i>	LC	No	Perennial	Herb
ASTERACEAE	<i>Gazania krebsiana</i> Less. subsp. <i>serrulata</i> (DC.) Roessler	LC	No	Perennial	Herb
ASTERACEAE	<i>Geigeria aspera</i> Harv. var. <i>aspera</i>	LC	No	Perennial	Herb
ASTERACEAE	<i>Gerbera ambigua</i> (Cass.) Sch.Bip.	LC	No	Perennial	Herb
ASTERACEAE	<i>Helichrysum cerastioides</i> DC. var. <i>cerastioides</i>	LC	No	Perennial	Herb
ASTERACEAE	<i>Helichrysum difficile</i> Hilliard	LC	No	Perennial	Herb
ASTERACEAE	<i>Helichrysum harveyanum</i> Wild	LC	No	Perennial	Herb
ASTERACEAE	<i>Helichrysum mutabile</i> Hilliard	LC	No	Perennial	Herb
ASTERACEAE	<i>Helichrysum nudifolium</i> (L.) Less. var. <i>nudifolium</i>	LC	No	Perennial	Herb
ASTERACEAE	<i>Helichrysum paronychioides</i> DC.	LC	No	Perennial	Dwarf shrub, herb
ASTERACEAE	<i>Helichrysum setosum</i> Harv.	LC	No	Perennial	Herb, shrub
ASTERACEAE	<i>Laggera decurrens</i> (Vahl) Hepper & J.R.I.Wood	LC	No	Perennial	Herb
ASTERACEAE	<i>Macledium zeyheri</i> (Sond.) S.Ortiz subsp. <i>zeyheri</i>	LC	No	Perennial	Herb
ASTERACEAE	<i>Nidorella hottentotica</i> DC.	LC	No	Annual	Herb
ASTERACEAE	<i>Senecio burchellii</i> DC.	LC	No	Perennial	Dwarf shrub, shrub
ASTERACEAE	<i>Senecio erubescens</i> Aiton var. <i>crepidifolius</i> DC.	LC	No	Perennial	Herb
ASTERACEAE	<i>Senecio erubescens</i> Aiton var. <i>erubescens</i>	LC	No	Perennial	Herb
ASTERACEAE	<i>Senecio harveianus</i> MacOwan	LC	No	Perennial	Dwarf shrub, herb
ASTERACEAE	<i>Senecio inornatus</i> DC.	LC	No	Perennial	Herb
ASTERACEAE	<i>Senecio oxyriifolius</i> DC. subsp. <i>oxyriifolius</i>	LC	No	Perennial	Herb, succulent
ASTERACEAE	<i>Senecio polyodon</i> DC. var. <i>polyodon</i>	LC	No	Perennial	Herb
ASTERACEAE	<i>Senecio striatifolius</i> DC.	LC	No	Perennial	Herb
ASTERACEAE	<i>Senecio venosus</i> Harv.	LC	No	Perennial	Herb
ASTERACEAE	<i>Ursinia nana</i> DC. subsp. <i>leptophylla</i> Prassler	LC	No	Perennial	Herb
ASTERACEAE	<i>Vernonia staehelinoides</i> Harv.	LC	No	Perennial	Shrub, suffrutex
BORAGINACEAE	<i>Trichodesma physaloides</i> (Fenzl) A.DC.	LC	No	Perennial	Herb
BUDDLEJACEAE	<i>Nuxia congesta</i> R.Br. ex Fresen.	LC	No	Perennial	Shrub, tree

CAPPARACEAE	<i>Cleome maculata</i> (Sond.) Szyszyl.	LC	No	Annual	Herb
CAPPARACEAE	<i>Cleome monophylla</i> L.	LC	No	Annual	Herb
CAPPARACEAE	<i>Maerua cafra</i> (DC.) Pax	LC	No	Perennial	Shrub, tree
CARYOPHYLLACEAE	<i>Pollichia campestris</i> Aiton	LC	No	Perennial	Herb
CELASTRACEAE	<i>Maytenus undata</i> (Thunb.) Blakelock	LC	No	Perennial	Shrub, tree
CELASTRACEAE	<i>Pterocelastrus echinatus</i> N.E.Br.	LC	No	Perennial	Shrub, tree
CELASTRACEAE	<i>Salacia rehmannii</i> Schinz	LC	No	Perennial	Dwarf shrub
CHRYSOBALANACEAE	<i>Parinari capensis</i> Harv. subsp. <i>capensis</i>	LC	No	Perennial (occ. annual)	Dwarf shrub
COLCHICACEAE	<i>Colchicum melanthoides</i> (Willd.) J.C.Manning & Vinn. subsp. <i>melanthoides</i>	LC	No	Perennial	Geophyte
COMBRETACEAE	<i>Combretum moggii</i> Exell	LC	No	Perennial	Shrub, tree
COMBRETACEAE	<i>Combretum molle</i> R.Br. ex G.Don	LC	No	Perennial	Tree
COMMELINACEAE	<i>Commelina africana</i> L. var. <i>krebsiana</i> (Kunth) C.B.Clarke	LC	No	Perennial	Herb
COMMELINACEAE	<i>Commelina livingstonii</i> C.B.Clarke	LC	No	Perennial	Herb
COMMELINACEAE	<i>Floscopa glomerata</i> (Willd. ex Schult. & J.H.Schult.) Hassk.	LC	No	Perennial	Helophyte, herb
CONVOLVULACEAE	<i>Ipomoea bathycolpos</i> Hallier f.	LC	No	Perennial	Herb
CONVOLVULACEAE	<i>Ipomoea crassipes</i> Hook. var. <i>crassipes</i>	LC	No	Perennial	Herb, succulent
CONVOLVULACEAE	<i>Ipomoea ommanneyi</i> Rendle	LC	No	Perennial	Herb, succulent
CONVOLVULACEAE	<i>Ipomoea simplex</i> Thunb.	LC	No	Perennial	Herb, succulent
CONVOLVULACEAE	<i>Ipomoea transvaalensis</i> A.Meeuse	LC	No	Perennial	Herb, succulent
CRASSULACEAE	<i>Cotyledon orbiculata</i> L. var. <i>oblonga</i> (Haw.) DC.	LC	No	Perennial	Dwarf shrub, succulent Lithophyte, shrub, succulent
CRASSULACEAE	<i>Kalanchoe thyrsiflora</i> Harv.	LC	No	Perennial	
CYPERACEAE	<i>Ascolepis capensis</i> (Kunth) Ridl.	LC	No	Perennial	Cyperoid, herb
CYPERACEAE	<i>Bulbostylis burchellii</i> (Ficalho & Hiern) C.B.Clarke	LC	No	Perennial	Cyperoid, herb, mesophyte
CYPERACEAE	<i>Bulbostylis contexta</i> (Nees) M.Bodard	LC	No	Perennial	Cyperoid, herb, mesophyte
CYPERACEAE	<i>Cyperus congestus</i> Vahl	LC	No	Perennial	Cyperoid, helophyte, herb
CYPERACEAE	<i>Cyperus deciduus</i> Boeckeler	LC	No	Perennial	Cyperoid, helophyte, herb
CYPERACEAE	<i>Cyperus decurvatus</i> (C.B.Clarke) C.Archer & Goetgh.	LC	No	Perennial	Cyperoid, herb, mesophyte
CYPERACEAE	<i>Cyperus fastigiatus</i> Rottb.	LC	No	Perennial	Cyperoid, helophyte, herb
CYPERACEAE	<i>Cyperus margaritaceus</i> Vahl var. <i>margaritaceus</i>	LC	No	Perennial	Cyperoid, herb, mesophyte

CYPERACEAE	<i>Cyperus obtusiflorus</i> Vahl var. <i>flavissimus</i> (Schrad.) Boeck.	LC	No	Perennial	Cyperoid, herb, mesophyte
CYPERACEAE	<i>Cyperus procerus</i> Rottb.	LC	No	Perennial	Cyperoid, helophyte, herb
CYPERACEAE	<i>Cyperus rupestris</i> Kunth var. <i>rupestris</i>	LC	No	Perennial	Cyperoid, herb, mesophyte
CYPERACEAE	<i>Cyperus sphaerospermus</i> Schrad.	LC	No	Perennial	Cyperoid, herb, mesophyte
CYPERACEAE	<i>Eleocharis dregeana</i> Steud.	LC	No	Perennial	Cyperoid, helophyte, herb
CYPERACEAE	<i>Fimbristylis complanata</i> (Retz.) Link	LC	No	Perennial	Cyperoid, helophyte, herb
CYPERACEAE	<i>Fimbristylis dichotoma</i> (L.) Vahl subsp. <i>dichotoma</i>	LC	No	Perennial	Cyperoid, helophyte, herb, mesophyte
CYPERACEAE	<i>Fuirena pubescens</i> (Poir.) Kunth var. <i>pubescens</i>	LC	No	Perennial	Cyperoid, helophyte, herb, mesophyte
CYPERACEAE	<i>Fuirena stricta</i> Steud. var. <i>stricta</i>	LC	No	Perennial	Cyperoid, helophyte, herb, sudd hydrophyte
CYPERACEAE	<i>Isolepis costata</i> Hochst. ex A.Rich.	LC	No	Perennial	Cyperoid, helophyte, herb
CYPERACEAE	<i>Isolepis sepulcralis</i> Steud.	LC	No	Annual	Cyperoid, helophyte, herb
CYPERACEAE	<i>Kyllinga alba</i> Nees	LC	No	Perennial	Cyperoid, herb, mesophyte
CYPERACEAE	<i>Kyllinga erecta</i> Schumach. var. <i>erecta</i>	LC	No	Perennial	Cyperoid, helophyte, herb
CYPERACEAE	<i>Kyllinga melanosperma</i> Nees	LC	No	Perennial	Cyperoid, helophyte, herb
CYPERACEAE	<i>Lipocarpha nana</i> (A.Rich.) Cherm.	LC	No	Annual	Cyperoid, helophyte, herb
CYPERACEAE	<i>Pycreus macranthus</i> (Boeckeler) C.B.Clarke	LC	No	Perennial	Cyperoid, helophyte, herb
CYPERACEAE	<i>Pycreus mundii</i> Nees	LC	No	Perennial	Cyperoid, emergent hydrophyte, helophyte, herb, sudd hydrophyte
CYPERACEAE	<i>Pycreus nitidus</i> (Lam.) J.Raynal	LC	No	Perennial	Cyperoid, helophyte, herb, sudd hydrophyte
CYPERACEAE	<i>Pycreus pumilus</i> (L.) Nees	LC	No	Annual	Cyperoid, helophyte, herb
CYPERACEAE	<i>Rhynchospora brownii</i> Roem. & Schult.	LC	No	Perennial	Cyperoid, helophyte, herb
CYPERACEAE	<i>Schoenoplectus brachyceras</i> (Hochst. ex A.Rich.) Lye	LC	No	Perennial	Cyperoid, emergent hydrophyte, helophyte, herb
CYPERACEAE	<i>Schoenoplectus muricinux</i> (C.B.Clarke) J.Raynal	LC	No	Perennial	Cyperoid, emergent hydrophyte, helophyte, herb
CYPERACEAE	<i>Scirpoides burkei</i> (C.B.Clarke) Goetgh., Muasya & D.A.Simpson	LC	No	Perennial	Cyperoid, herb, mesophyte

CYPERACEAE	<i>Scleria dregeana</i> Kunth	LC	No	Perennial	Cyperoid, helophyte, herb
DICHAPETALACEAE	<i>Dichapetalum cymosum</i> (Hook.) Engl.	LC	No	Perennial	Dwarf shrub
DIPSACACEAE	<i>Cephalaria zeyheriana</i> Szabó	LC	No	Perennial	Herb
DIPSACACEAE	<i>Scabiosa columbaria</i> L.	LC	No	Perennial	Herb
DROSERACEAE	<i>Drosera collinsiae</i> N.E.Br. ex Burtt Davy	LC	No	Perennial	Carnivore, herb
EBENACEAE	<i>Diospyros lycioides</i> Desf. subsp. <i>guerkei</i> (Kuntze) De Winter	LC	No	Perennial	Shrub, tree
EBENACEAE	<i>Diospyros lycioides</i> Desf. subsp. <i>lycioides</i>	LC	No	Perennial	Shrub
ERICACEAE	<i>Erica drakensbergensis</i> Guthrie & Bolus	LC	No	Perennial	Shrub
ERIOCAULACEAE	<i>Eriocaulon abyssinicum</i> Hochst.	LC	No	Annual	Herb, hydrophyte, tenagophyte
ERIOCAULACEAE	<i>Eriocaulon sonderianum</i> Körn.	LC	No	Perennial	Herb, hydrophyte, tenagophyte
ERIOCAULACEAE	<i>Eriocaulon transvaalicum</i> N.E.Br. subsp. <i>transvaalicum</i>	LC	No	Annual (occ. perennial)	Herb, hydrophyte, tenagophyte
ERIOCAULACEAE	<i>Syngonanthus wahlbergii</i> (Wikstr. ex Körn.) Ruhland var. <i>wahlbergii</i>	LC	No	Perennial	Herb, hydrophyte, tenagophyte
ERIOSPERMACEAE	<i>Eriospermum porphyrovalve</i> Baker	LC	No	Perennial	Geophyte
EUPHORBIACEAE	<i>Acalypha angustata</i> Sond.	LC	No	Perennial	Dwarf shrub, herb
EUPHORBIACEAE	<i>Clutia pulchella</i> L. var. <i>pulchella</i>	LC	No	Perennial	Dwarf shrub, herb, shrub
EUPHORBIACEAE	<i>Jatropha lagarinthoides</i> Sond.	LC	No	Perennial	Dwarf shrub, herb, succulent
FABACEAE	<i>Acacia karroo</i> Hayne	LC	No	Perennial	Shrub, tree
FABACEAE	<i>Acacia robusta</i> Burch. subsp. <i>robusta</i>	LC	No	Perennial	Tree
FABACEAE	<i>Astragalus atropilosulus</i> (Hochst.) Bunge subsp. <i>burkeanus</i> (Harv.) J.B.Gillett var. <i>burkeanus</i>	LC	No	Perennial	Herb
FABACEAE	<i>Burkea africana</i> Hook.	LC	No	Perennial	Tree
FABACEAE	<i>Chamaecrista comosa</i> E.Mey. var. <i>capricornia</i> (Steyaert) Lock	LC	No	Perennial	Herb
FABACEAE	<i>Chamaecrista comosa</i> E.Mey. var. <i>comosa</i>	LC	No	Perennial	Herb
FABACEAE	<i>Chamaecrista mimosoides</i> (L.) Greene	LC	No	Annual (occ. perennial)	Herb
FABACEAE	<i>Crotalaria brachycarpa</i> (Benth.) Burtt Davy ex I. Verd.	LC	No	Annual (occ. perennial)	Herb
FABACEAE	<i>Dichilus strictus</i> E.Mey.	LC	No	Perennial	Dwarf shrub, herb, shrub
FABACEAE	<i>Dolichos falciformis</i> E.Mey.	LC	No	Perennial	Herb
FABACEAE	<i>Elephantorrhiza elephantina</i> (Burch.) Skeels	LC	No	Annual (occ. perennial)	Dwarf shrub, shrub, suffrutex
FABACEAE	<i>Eriosema salignum</i> E.Mey.	LC	No	Perennial	Herb

FABACEAE	<i>Indigostrum burkeanum</i> (Benth. ex Harv.) Schrire	LC	No	Perennial	Herb
FABACEAE	<i>Indigofera comosa</i> N.E.Br.	LC	No	Perennial	Shrub
FABACEAE	<i>Indigofera egens</i> N.E.Br.	LC	No	Perennial	Shrub Dwarf shrub, herb, shrub
FABACEAE	<i>Indigofera filipes</i> Benth. ex Harv.	LC	No	Perennial	shrub
FABACEAE	<i>Indigofera hilaris</i> Eckl. & Zeyh. var. <i>hilaris</i>	LC	No	Perennial	Herb
FABACEAE	<i>Indigofera oxalidea</i> Welw. ex Baker	LC	No	Perennial	Herb
FABACEAE	<i>Indigofera oxytropis</i> Benth. ex Harv.	LC	No	Perennial	Herb
FABACEAE	<i>Indigofera sordida</i> Benth. ex Harv.	LC	No	Perennial	Herb
FABACEAE	<i>Listia solitudinis</i> (Dummer) B.-E.van Wyk & Boatwr.	LC	No	[No lifecycle defined]	[No lifeform defined]
FABACEAE	<i>Macrotyloma axillare</i> (E.Mey.) Verdc. var. <i>axillare</i>	LC	No	Perennial	Climber, herb
FABACEAE	<i>Pearsonia grandifolia</i> (Bolus) Polhill subsp. <i>latibracteolata</i> (Dummer) Polhill	LC	No	Perennial	Herb
FABACEAE	<i>Pearsonia sessilifolia</i> (Harv.) Dummer subsp. <i>sessilifolia</i>	LC	No	Perennial	Dwarf shrub, herb
FABACEAE	<i>Rhynchosia minima</i> (L.) DC. var. <i>prostrata</i> (Harv.) Meikle	LC	No	Perennial	Climber, herb
FABACEAE	<i>Rhynchosia monophylla</i> Schltr.	LC	No	Perennial	Herb
FABACEAE	<i>Rhynchosia nitens</i> Benth. ex Harv.	LC	No	Perennial	Shrub
FABACEAE	<i>Sphenostylis angustifolia</i> Sond.	LC	No	Perennial	Dwarf shrub, herb Dwarf shrub, herb, shrub
FABACEAE	<i>Tephrosia elongata</i> E.Mey. var. <i>elongata</i>	LC	No	Perennial	shrub
FABACEAE	<i>Tephrosia longipes</i> Meisn. subsp. <i>longipes</i> var. <i>longipes</i>	LC	No	Annual (occ. perennial)	Dwarf shrub, herb, shrub
FABACEAE	<i>Tephrosia semiglabra</i> Sond.	LC	No	Perennial	Herb
FABACEAE	<i>Vigna unguiculata</i> (L.) Walp. subsp. <i>stenophylla</i> (Harv.) Maréchal, Mascherpa & Stainier	LC	No	Perennial	Climber, herb
FABACEAE	<i>Zornia linearis</i> E.Mey.	LC	No	Perennial	Herb
FABACEAE	<i>Zornia milneana</i> Mohlenbr.	LC	No	Perennial	Herb
GENTIANACEAE	<i>Chironia palustris</i> Burch. subsp. <i>transvaalensis</i> (Gilg) I.Verd.	LC	No	Annual	Herb
GENTIANACEAE	<i>Chironia purpurascens</i> (E.Mey.) Benth. & Hook.f. subsp. <i>humilis</i> (Gilg) I.Verd.	LC	No	Annual (occ. perennial)	Herb
GENTIANACEAE	<i>Sebaea exigua</i> (Oliv.) Schinz	LC	No	Annual	Herb
GERANIACEAE	<i>Monsonia angustifolia</i> E.Mey. ex A.Rich.	LC	No	Annual	Herb
GERANIACEAE	<i>Monsonia burkeana</i> Planch. ex Harv.	LC	No	Annual	Herb
GERANIACEAE	<i>Pelargonium dolomiticum</i> R.Knuth	LC	No	Perennial	Dwarf shrub, succulent
GERANIACEAE	<i>Pelargonium luridum</i> (Andrews) Sweet	LC	No	Perennial	Geophyte, succulent
GERANIACEAE	<i>Pelargonium multifcaule</i> Jacq. subsp. <i>subherbaceum</i> (R.Knuth) J.J.A.van der Walt	LC	No	Perennial	Dwarf shrub

GISEKIACEAE	<i>Gisekia pharmacioides</i> L. var. <i>pharmacioides</i>	LC	No	Annual	Herb
HALORAGACEAE	<i>Laurembergia repens</i> (L.) P.J.Bergius subsp. <i>brachypoda</i> (Welw. ex Hiern) Oberm.	LC	No	Annual (occ. perennial)	Herb
HETEROPYXIDACEAE	<i>Heteropyxis natalensis</i> Harv.	LC	No	Perennial	Shrub, tree
HYACINTHACEAE	<i>Drimia calcarata</i> (Baker) Stedje	LC	No	Perennial	Geophyte
HYACINTHACEAE	<i>Ledebouria cooperi</i> (Hook.f.) Jessop	LC	No	Perennial	Geophyte
HYACINTHACEAE	<i>Ledebouria inquinata</i> (C.A.Sm.) Jessop	LC	No	Perennial	Geophyte
HYACINTHACEAE	<i>Ledebouria revoluta</i> (L.f.) Jessop	LC	No	Perennial	Geophyte
HYPERICACEAE	<i>Hypericum lalandii</i> Choisy	LC	No	Perennial	Herb
HYPOXIDACEAE	<i>Hypoxis filiformis</i> Baker	LC	No	Perennial	Geophyte
HYPOXIDACEAE	<i>Hypoxis iridifolia</i> Baker	LC	No	Perennial	Geophyte
IRIDACEAE	<i>Dierama insigne</i> N.E.Br.	LC	No	Perennial	Geophyte, herb
IRIDACEAE	<i>Dierama mossii</i> (N.E.Br.) Hilliard	LC	No	Perennial	Geophyte, herb
IRIDACEAE	<i>Gladiolus crassifolius</i> Baker	LC	No	Perennial	Geophyte, herb
IRIDACEAE	<i>Gladiolus elliotii</i> Baker	LC	No	Perennial	Geophyte, herb
IRIDACEAE	<i>Gladiolus permeabilis</i> D.Delaroche subsp. <i>edulis</i> (Burch. ex Ker Gawl.) Oberm.	LC	No	Perennial	Geophyte, herb
IRIDACEAE	<i>Gladiolus vinosomaculatus</i> Kies	LC	No	Perennial	Geophyte, herb
IRIDACEAE	<i>Hesperantha longicollis</i> Baker	LC	No	Perennial	Geophyte, herb
IRIDACEAE	<i>Lapeirousia sandersonii</i> Baker	LC	No	Perennial	Geophyte, herb
IRIDACEAE	<i>Tritonia nelsonii</i> Baker	LC	No	Perennial	Geophyte, herb
JUNCACEAE	<i>Juncus dregeanus</i> Kunth subsp. <i>dregeanus</i>	LC	No	Perennial	Helophyte, herb
LAMIACEAE	<i>Acrotome hispida</i> Benth.	LC	No	Perennial	Herb
LAMIACEAE	<i>Aeollanthus buchnerianus</i> Briq.	LC	No	Perennial	Dwarf shrub, herb, succulent
LAMIACEAE	<i>Mentha aquatica</i> L.	LC	No	Perennial	Herb
LAMIACEAE	<i>Plectranthus cylindraceus</i> Hochst. ex Benth.	LC	No	Perennial	Herb, succulent
LAMIACEAE	<i>Pycnostachys reticulata</i> (E.Mey.) Benth.	LC	No	Perennial	Herb
LAMIACEAE	<i>Rothea hirsuta</i> (Hochst.) R.Fern.	LC	No	Perennial	Herb
LAMIACEAE	<i>Rothea louwalbertsii</i> (P.P.J.Herman) P.P.J.Herman & Retief	LC	No	Perennial	Herb
LAMIACEAE	<i>Syncolostemon pretoriae</i> (Gürke) D.F.Otieno	LC	No	[No lifecycle defined]	Herb
LAMIACEAE	<i>Teucrium trifidum</i> Retz.	LC	No	Perennial	Herb
LENTIBULARIACEAE	<i>Genlisea hispidula</i> Stapf	LC	No	Annual (occ. perennial)	Carnivore, herb, pleustophyte

LENTIBULARIACEAE	<i>Utricularia welwitschii</i> Oliv.	LC	No	Perennial Annual (occ. perennial)	Carnivore, herb
LOBELIACEAE	<i>Lobelia erinus</i> L.	LC	No		Herb
LOBELIACEAE	<i>Monopsis decipiens</i> (Sond.) Thulin	LC	No	Perennial	Herb Parasite, shrub, succulent
LORANTHACEAE	<i>Tapinanthus rubromarginatus</i> (Engl.) Danser	LC	No	Perennial	
LYTHRACEAE	<i>Nesaea cordata</i> Hiern	LC	No	Annual	Herb
LYTHRACEAE	<i>Nesaea schinzii</i> Koehne	LC	No	Perennial	Dwarf shrub
MALPIGHIACEAE	<i>Sphedamnocarpus pruriens</i> (A.Juss.) Szyszyl. subsp. <i>pruriens</i>	LC	No	Perennial	Climber, shrub
MALPIGHIACEAE	<i>Triaspis hypericoides</i> (DC.) Burch. subsp. <i>nelsonii</i> (Oliv.) Immelman	LC	No	Perennial	Climber, shrub
MALVACEAE	<i>Grewia flava</i> DC.	LC	No	Perennial	Shrub
MALVACEAE	<i>Hibiscus engleri</i> K.Schum.	LC	No	Perennial	Herb
MALVACEAE	<i>Pavonia transvaalensis</i> (Ulbr.) A.Meeuse	LC	No	Annual (occ. perennial)	Dwarf shrub, herb
MALVACEAE	<i>Sida cordifolia</i> L. subsp. <i>cordifolia</i>	LC	No	Annual (occ. perennial)	Dwarf shrub
MALVACEAE	<i>Triumfetta pilosa</i> Roth var. <i>tomentosa</i> Szyszyl. ex Sprague & Hutch.	LC	No	Perennial	Shrub
MALVACEAE	<i>Triumfetta sonderi</i> Ficalho & Hiern	LC	No	Perennial	Dwarf shrub
MELASTOMATAACEAE	<i>Antherotoma debilis</i> (Sond.) Jacq.-Fél.	LC	No	Perennial	Herb
MOLLUGINACEAE	<i>Limeum viscosum</i> (J.Gay) Fenzl subsp. <i>viscosum</i> var. <i>kraussii</i> Friedrich	LC	No	Annual	Herb
OCHNACEAE	<i>Ochna pulchra</i> Hook.f.	LC	No	Perennial	Shrub, tree
OLACACEAE	<i>Ximenia caffra</i> Sond. var. <i>caffra</i>	LC	No	Perennial	Shrub, tree
ONAGRACEAE	<i>Epilobium hirsutum</i> L.	LC	No	Perennial	Herb
ORCHIDACEAE	<i>Bonatea antennifera</i> Rolfe	LC	No	[No lifecycle defined]	[No lifeform defined]
ORCHIDACEAE	<i>Disa polygonoides</i> Lindl.	LC	No	Perennial	Geophyte, herb
ORCHIDACEAE	<i>Eulophia clitellifera</i> (Rchb.f.) Bolus	LC	No	Perennial	Geophyte, herb, succulent
ORCHIDACEAE	<i>Eulophia hians</i> Spreng. var. <i>hians</i>	LC	No	Perennial	Geophyte, herb
ORCHIDACEAE	<i>Eulophia hians</i> Spreng. var. <i>nutans</i> (Sond.) S.Thomas	LC	No	Perennial	Geophyte, herb
ORCHIDACEAE	<i>Eulophia ovalis</i> Lindl. var. <i>ovalis</i>	LC	No	Perennial	Geophyte, herb
ORCHIDACEAE	<i>Eulophia tuberculata</i> Bolus	LC	No	Perennial	Geophyte, herb, succulent
ORCHIDACEAE	<i>Habenaria filicornis</i> Lindl.	LC	No	Perennial	Geophyte, herb
OROBANCHACEAE	<i>Buchnera reducta</i> Hiern	LC	No	Annual	Herb, parasite
OROBANCHACEAE	<i>Cycnium adonense</i> E.Mey. ex Benth.	LC	No	Perennial	Herb, parasite
OROBANCHACEAE	<i>Cycnium tubulosum</i> (L.f.) Engl. subsp. <i>tubulosum</i>	LC	No	Perennial	Herb

OROBANCHACEAE	<i>Sopubia cana</i> Harv. var. <i>cana</i>	LC	No	Perennial	Herb, parasite
OROBANCHACEAE	<i>Striga asiatica</i> (L.) Kuntze	LC	No	Annual	Herb, parasite
OROBANCHACEAE	<i>Striga elegans</i> Benth.	LC	No	Annual	Herb, parasite
OXALIDACEAE	<i>Oxalis depressa</i> Eckl. & Zeyh.	LC	No	Perennial	Geophyte, succulent
OXALIDACEAE	<i>Oxalis obliquifolia</i> Steud. ex A.Rich.	LC	No	Perennial	Geophyte Climber, shrub, succulent
PASSIFLORACEAE	<i>Adenia glauca</i> Schinz	LC	No	Perennial	
PEDALIACEAE	<i>Sesamum alatum</i> Thonn.	LC	No	Annual	Herb
POACEAE	<i>Alloteropsis semialata</i> (R.Br.) Hitchc. subsp. <i>eckloniana</i> (Nees) Gibbs Russ.	LC	No	Perennial	Graminoid
POACEAE	<i>Andropogon appendiculatus</i> Nees	LC	No	Perennial	Graminoid
POACEAE	<i>Andropogon eucomus</i> Nees	LC	No	Perennial	Graminoid
POACEAE	<i>Andropogon huillensis</i> Rendle	LC	No	Perennial	Graminoid
POACEAE	<i>Andropogon schirensis</i> Hochst. ex A.Rich.	LC	No	Perennial	Graminoid
POACEAE	<i>Anthephora pubescens</i> Nees	LC	No	Perennial	Graminoid
POACEAE	<i>Aristida aequiglumis</i> Hack.	LC	No	Perennial	Graminoid
POACEAE	<i>Aristida canescens</i> Henrard subsp. <i>canescens</i>	LC	No	Perennial	Graminoid
POACEAE	<i>Aristida congesta</i> Roem. & Schult. subsp. <i>barbicollis</i> (Trin. & Rupr.) De Winter	LC	No	Perennial (occ. annual)	Graminoid
POACEAE	<i>Aristida congesta</i> Roem. & Schult. subsp. <i>congesta</i>	LC	No	Perennial	Graminoid
POACEAE	<i>Aristida diffusa</i> Trin. subsp. <i>burkei</i> (Stapf) Melderis	LC	No	Perennial	Graminoid
POACEAE	<i>Aristida recta</i> Franch.	LC	No	Perennial	Graminoid
POACEAE	<i>Aristida stipitata</i> Hack. subsp. <i>stipitata</i>	LC	No	Perennial	Graminoid
POACEAE	<i>Arundinella nepalensis</i> Trin.	LC	No	Perennial	Graminoid
POACEAE	<i>Bewsia biflora</i> (Hack.) Gooss.	LC	No	Perennial	Graminoid
POACEAE	<i>Brachiaria brizantha</i> (A.Rich.) Stapf	LC	No	Perennial	Graminoid
POACEAE	<i>Brachiaria serrata</i> (Thunb.) Stapf	LC	No	Perennial	Graminoid
POACEAE	<i>Brachiaria subulifolia</i> (Mez) Clayton	LC	No	Perennial	Graminoid
POACEAE	<i>Chloris pycnothrix</i> Trin.	LC	No	Annual (occ. perennial)	Graminoid
POACEAE	<i>Cymbopogon nardus</i> (L.) Rendle	LC	No	Perennial	Graminoid
POACEAE	<i>Cynodon dactylon</i> (L.) Pers.	LC	No	Perennial	Graminoid
POACEAE	<i>Digitaria diagonalis</i> (Nees) Stapf var. <i>diagonalis</i>	LC	No	Perennial	Graminoid
POACEAE	<i>Digitaria eriantha</i> Steud.	LC	No	Perennial	Graminoid
POACEAE	<i>Digitaria ternata</i> (A.Rich.) Stapf	LC	No	Annual	Graminoid

POACEAE	<i>Digitaria tricholaenoides</i> Stapf	LC	No	Perennial	Graminoid
POACEAE	<i>Diheteropogon amplectens</i> (Nees) Clayton var. <i>amplectens</i>	LC	No	Perennial	Graminoid
POACEAE	<i>Diheteropogon filifolius</i> (Nees) Clayton	LC	No	Perennial	Graminoid
POACEAE	<i>Elionurus muticus</i> (Spreng.) Kunth	LC	No	Perennial	Graminoid
POACEAE	<i>Eragrostis amabilis</i> (L.) Hook. & Arn.	LC	No	Annual	Graminoid
POACEAE	<i>Eragrostis curvula</i> (Schrad.) Nees	LC	No	Perennial	Graminoid
POACEAE	<i>Eragrostis gummiflua</i> Nees	LC	No	Perennial	Graminoid
POACEAE	<i>Eragrostis inamoena</i> K.Schum.	LC	No	Perennial	Graminoid
POACEAE	<i>Eragrostis nindensis</i> Ficalho & Hiern	LC	No	Perennial	Graminoid
POACEAE	<i>Eragrostis racemosa</i> (Thunb.) Steud.	LC	No	Perennial	Graminoid
POACEAE	<i>Eragrostis sclerantha</i> Nees subsp. <i>sclerantha</i>	LC	No	Perennial	Graminoid
POACEAE	<i>Eriochrysis pallida</i> Munro	LC	No	Perennial	Graminoid
POACEAE	<i>Harpochloa falx</i> (L.f.) Kuntze	LC	No	Perennial	Graminoid
POACEAE	<i>Helictotrichon turgidulum</i> (Stapf) Schweick.	LC	No	Perennial	Graminoid
POACEAE	<i>Heteropogon contortus</i> (L.) Roem. & Schult.	LC	No	Perennial	Graminoid
POACEAE	<i>Hyparrhenia anamesa</i> Clayton	LC	No	Perennial	Graminoid
POACEAE	<i>Hyparrhenia filipendula</i> (Hochst.) Stapf var. <i>pilosa</i> (Hochst.) Stapf	LC	No	Perennial	Graminoid
POACEAE	<i>Hyparrhenia hirta</i> (L.) Stapf	LC	No	Perennial	Graminoid
POACEAE	<i>Imperata cylindrica</i> (L.) Raeusch.	LC	No	Perennial	Graminoid
POACEAE	<i>Ischaemum fasciculatum</i> Brongn.	LC	No	Perennial	Graminoid
POACEAE	<i>Lophacme digitata</i> Stapf	LC	No	Perennial	Graminoid
POACEAE	<i>Loudetia simplex</i> (Nees) C.E.Hubb.	LC	No	Perennial	Graminoid
POACEAE	<i>Melinis nerviglumis</i> (Franch.) Zizka	LC	No	Perennial	Graminoid
POACEAE	<i>Melinis repens</i> (Willd.) Zizka subsp. <i>repens</i>	LC	No	Annual (occ. perennial)	Graminoid
POACEAE	<i>Microchloa caffra</i> Nees	LC	No	Perennial	Graminoid
POACEAE	<i>Microchloa kunthii</i> Desv.	LC	No	Perennial	Graminoid
POACEAE	<i>Monocymbium cerasiiforme</i> (Nees) Stapf	LC	No	Perennial	Graminoid
POACEAE	<i>Panicum coloratum</i> L. var. <i>coloratum</i>	LC	No	Perennial	Graminoid
POACEAE	<i>Panicum maximum</i> Jacq.	LC	No	Perennial	Graminoid
POACEAE	<i>Panicum natalense</i> Hochst.	LC	No	Perennial	Graminoid
POACEAE	<i>Panicum schinzii</i> Hack.	LC	No	Annual	Graminoid

POACEAE	<i>Pennisetum thunbergii</i> Kunth	LC	No	Perennial Annual (occ.)	Graminoid
POACEAE	<i>Perotis patens</i> Gand.	LC	No	perennial) Perennial (occ.)	Graminoid
POACEAE	<i>Pogonarthria squarrosa</i> (Roem. & Schult.) Pilg.	LC	No	annual)	Graminoid
POACEAE	<i>Schizachyrium sanguineum</i> (Retz.) Alston	LC	No	Perennial	Graminoid
POACEAE	<i>Schizachyrium ursulus</i> Stapf	LC	No	Perennial	Graminoid
POACEAE	<i>Setaria sphacelata</i> (Schumach.) Stapf & C.E.Hubb. ex M.B.Moss var. <i>torta</i> (Stapf) Clayton	LC	No	Perennial Annual (occ.)	Graminoid
POACEAE	<i>Sorghum versicolor</i> Andersson	LC	No	perennial)	Graminoid
POACEAE	<i>Sporobolus conrathii</i> Chiov.	LC	No	Perennial	Graminoid
POACEAE	<i>Sporobolus festivus</i> Hochst. ex A.Rich.	LC	No	Perennial	Graminoid
POACEAE	<i>Sporobolus pectinatus</i> Hack.	LC	No	Perennial	Graminoid
POACEAE	<i>Sporobolus pyramidalis</i> P.Beauv.	LC	No	Perennial	Graminoid
POACEAE	<i>Sporobolus subtilis</i> Kunth	LC	No	Perennial	Graminoid
POACEAE	<i>Stiburus alopecuroides</i> (Hack.) Stapf	LC	No	Perennial	Graminoid
POACEAE	<i>Stiburus conrathii</i> Hack.	LC	No	Perennial	Graminoid
POACEAE	<i>Themeda triandra</i> Forssk.	LC	No	Perennial	Graminoid
POACEAE	<i>Trachypogon spicatus</i> (L.f.) Kuntze	LC	No	Perennial	Graminoid
POACEAE	<i>Trichoneura grandiglumis</i> (Nees) Ekman	LC	No	Perennial	Graminoid
POACEAE	<i>Tristachya biseriata</i> Stapf	LC	No	Perennial	Graminoid
POACEAE	<i>Tristachya rehmannii</i> Hack.	LC	No	Perennial	Graminoid
POACEAE	<i>Urelytrum agropyroides</i> (Hack.) Hack.	LC	No	Perennial	Graminoid
POLYGALACEAE	<i>Polygala africana</i> Chodat	LC	No	Annual	Herb
POLYGALACEAE	<i>Polygala capillaris</i> E.Mey. ex Harv. subsp. <i>capillaris</i>	LC	No	Annual	Herb
POLYGALACEAE	<i>Polygala hottentotta</i> C.Presl	LC	No	Perennial	Dwarf shrub, herb
POLYGALACEAE	<i>Polygala rehmannii</i> Chodat	LC	No	Perennial	Herb
POLYGONACEAE	<i>Oxygonum dregeanum</i> Meisn. subsp. <i>canescens</i> (Sond.) Germish. var. <i>canescens</i>	LC	No	Annual	Herb
POLYGONACEAE	<i>Oxygonum dregeanum</i> Meisn. subsp. <i>canescens</i> (Sond.) Germish. var. <i>linearifolium</i> Germish.	LC	No	Annual	Dwarf shrub, herb
POLYGONACEAE	<i>Oxygonum dregeanum</i> Meisn. subsp. <i>dregeanum</i>	LC	No	Perennial Annual (occ.)	Herb Helophyte, herb, hydrophyte
POLYGONACEAE	<i>Persicaria attenuata</i> (R.Br.) Soják subsp. <i>africana</i> K.L.Wilson	LC	No	perennial)	Helophyte, herb
POLYGONACEAE	<i>Persicaria decipiens</i> (R.Br.) K.L.Wilson	LC	No	Annual	Helophyte, herb
POLYGONACEAE	<i>Persicaria meisneriana</i> (Cham. & Schltdl.) M.Gómez	LC	No	Annual (occ.)	Helophyte, herb,

				perennial)	hydrophyte
PORTULACACEAE	Anacampseros subnuda Poelln. subsp. subnuda	LC	No	Perennial	Herb, succulent
PORTULACACEAE	Portulaca kermesina N.E.Br.	LC	No	Annual (occ. perennial)	Herb, succulent
POTAMOGETONACEAE	Potamogeton schweinfurthii A.Benn.	LC	No	Perennial	Herb, hydrophyte
PROTEACEAE	Protea caffra Meisn. subsp. caffra	LC	No	Perennial	Shrub, tree
PROTEACEAE	Protea welwitschii Engl.	LC	No	Perennial	Dwarf shrub, shrub
RANUNCULACEAE	Clematis brachiata Thunb.	LC	No	Perennial	Climber
RHAMNACEAE	Ziziphus mucronata Willd. subsp. mucronata	LC	No	Perennial	Shrub, tree
RUBIACEAE	Afrocanthium gilfillanii (N.E.Br.) Lantz	LC	No	[No lifecycle defined]	[No lifeform defined]
RUBIACEAE	Fadogia homblei De Wild.	LC	No	Perennial	Herb
RUBIACEAE	Oldenlandia herbacea (L.) Roxb. var. herbacea	LC	No	Annual (occ. perennial)	Herb
RUBIACEAE	Pachystigma pygmaeum (Schltr.) Robyns	LC	No	Perennial	Dwarf shrub
RUBIACEAE	Pachystigma thamnus Robyns	LC	No	Perennial	Dwarf shrub
RUBIACEAE	Pavetta zeyheri Sond. subsp. zeyheri	LC	No	Perennial	Shrub, tree
RUBIACEAE	Pentanisia angustifolia (Hochst.) Hochst.	LC	No	Perennial	Herb
RUBIACEAE	Psydrax livida (Hiern) Bridson	LC	No	Perennial	Shrub, tree
RUBIACEAE	Pygmaeothamnus zeyheri (Sond.) Robyns var. zeyheri	LC	No	Perennial	Dwarf shrub
RUBIACEAE	Rubia horrida (Thunb.) Puff	LC	No	Perennial	Herb
RUBIACEAE	Vangueria infausta Burch. subsp. infausta	LC	No	Perennial	Tree
RUTACEAE	Vepris reflexa I.Verd.	LC	No	Perennial	Shrub, tree
SANTALACEAE	Thesium deceptum N.E.Br.	LC	No	Perennial	Parasite, shrub
SANTALACEAE	Thesium gracile A.W.Hill	LC	No	Perennial	Herb, parasite
SANTALACEAE	Thesium magalismsontanum Sond.	LC	No	Perennial	Herb, parasite, shrub
SANTALACEAE	Thesium procerum N.E.Br.	LC	No	Perennial	Herb, parasite, shrub
SAPOTACEAE	Mimusops zeyheri Sond.	LC	No	Perennial	Shrub, tree
SCROPHULARIACEAE	Craterostigma wilmsii Engl. ex Diels	LC	No	Perennial	Herb, succulent
SCROPHULARIACEAE	Hebenstretia integrifolia L.	LC	No	Annual	Herb
SCROPHULARIACEAE	Jamesbrittenia aurantiaca (Burch.) Hilliard	LC	No	Perennial	Herb
SCROPHULARIACEAE	Jamesbrittenia burkeana (Benth.) Hilliard	LC	No	[No lifecycle defined]	Shrub, suffrutex
SCROPHULARIACEAE	Limosella longiflora Kuntze	LC	No	Annual	Herb, hydrophyte

SCROPHULARIACEAE	<i>Manulea parviflora</i> Benth. var. <i>parviflora</i>	LC	No	Perennial	Herb
SCROPHULARIACEAE	<i>Melanospermum foliosum</i> (Benth.) Hilliard	LC	No	Annual	Herb
SCROPHULARIACEAE	<i>Melanospermum transvaalense</i> (Hiern) Hilliard	LC	No	Annual	Herb
SCROPHULARIACEAE	<i>Zaluzianskya elongata</i> Hilliard & B.L.Burtt	LC	No	Perennial	Herb
SCROPHULARIACEAE	<i>Zaluzianskya spathacea</i> (Benth.) Walp.	LC	No	Perennial	Herb Geophyte, herb,
SELAGINELLACEAE	<i>Selaginella dregei</i> (C.Presl) Hieron.	LC	No	Perennial	lithophyte
SINOPTERIDACEAE	<i>Cheilanthes viridis</i> (Forssk.) Sw. var. <i>glauca</i> (Sim) Schelpe & N.C.Anthony	LC	No	Perennial	Geophyte, herb, lithophyte
SINOPTERIDACEAE	<i>Cheilanthes viridis</i> (Forssk.) Sw. var. <i>viridis</i>	LC	No	Perennial	Geophyte, herb, lithophyte
SINOPTERIDACEAE	<i>Pellaea calomelanos</i> (Sw.) Link var. <i>calomelanos</i>	LC	No	Perennial	Geophyte, herb, lithophyte
SOLANACEAE	<i>Solanum retroflexum</i> Dunal	LC	No	Annual	Herb
STRYCHNACEAE	<i>Strychnos pungens</i> Soler.	LC	No	Perennial	Shrub, tree Geophyte, herb, hydrophyte
THELYPTERIDACEAE	<i>Thelypteris confluens</i> (Thunb.) C.V.Morton	LC	No	Perennial	Geophyte, herb, hydrophyte
THYMELAEACEAE	<i>Gnidia sericocephala</i> (Meisn.) Gilg ex Engl.	LC	No	Perennial	Dwarf shrub, shrub
VAHLIACEAE	<i>Vahlia capensis</i> (L.f.) Thunb. subsp. <i>capensis</i>	LC	No	Annual (occ. perennial)	Herb
VERBENACEAE	<i>Lippia wilmsii</i> H.Pearson	LC	No	Perennial	Shrub
VITACEAE	<i>Cyphostemma humile</i> (N.E.Br.) Desc. ex Wild & R.B.Drumm. subsp. <i>dolichopus</i> (C.A.Sm.) Wild & R.B.Drumm.	LC	No	Perennial	Scrambler, succulent
EUPHORBIACEAE	<i>Acalypha caperonioides</i> Baill. var. <i>caperonioides</i>	DDT	No	Perennial	Dwarf shrub, herb
MYROTHAMNACEAE	<i>Myrothamnus flabellifolius</i> Welw.	DDT	No	Perennial	Dwarf shrub, shrub
AMARANTHACEAE	<i>Gomphrena celosioides</i> Mart.	Not Evaluated	No	Perennial	Herb
ASPARAGACEAE	<i>Asparagus exuvialis</i> Burch. forma <i>exuvialis</i>	Not Evaluated	No	Perennial	Shrub
ASTERACEAE	<i>Schkuhria pinnata</i> (Lam.) Kuntze ex Thell.	Not Evaluated	No	Annual	Herb
CARYOPHYLLACEAE	<i>Dianthus mooiensis</i> F.N.Williams subsp. <i>kirkii</i> (Burtt Davy) S.S.Hooper	Not Evaluated	No	Perennial	Herb
CARYOPHYLLACEAE	<i>Polycarpaea corymbosa</i> (L.) Lam. var. <i>corymbosa</i>	Not Evaluated	No	Annual	Herb
CRASSULACEAE	<i>Crassula setulosa</i> Harv. var. <i>setulosa</i> forma <i>setulosa</i>	Not Evaluated	No	Perennial	Herb, succulent
FUMARIACEAE	<i>Fumaria muralis</i> Sond. ex W.D.J.Koch subsp. <i>muralis</i>	Not Evaluated	No	Perennial	Herb
HYACINTHACEAE	<i>Ornithogalum tenuifolium</i> F.Delaroche subsp. <i>tenuifolium</i>	Not Evaluated	No	Perennial	Geophyte
LAMIACEAE	<i>Plectranthus barbatus</i> Andrews	Not Evaluated	No	Perennial	Herb, shrub

ONAGRACEAE	<i>Oenothera rosea</i> L'Hér. ex Aiton	Not Evaluated	No	Perennial	Herb
PHYTOLACCACEAE	<i>Phytolacca americana</i> L.	Not Evaluated	No	Perennial	Herb, succulent
POACEAE	<i>Eragrostis tef</i> (Zuccagni) Trotter	Not Evaluated	No	Annual	Graminoid
RUBIACEAE	<i>Richardia brasiliensis</i> Gomes	Not Evaluated	No	Perennial	Herb
RUBIACEAE	<i>Richardia scabra</i> L.	Not Evaluated	No	Annual	Herb
SOLANACEAE	<i>Solanum nigrum</i> L.	Not Evaluated	No	Annual	Herb
VERBENACEAE	<i>Verbena bonariensis</i> L.	Not Evaluated	No	Annual	Herb
AYTONIACEAE	<i>Mannia capensis</i> (Steph.) S.W.Arnell		No	Perennial	Bryophyte
AYTONIACEAE	<i>Plagiochasma rupestre</i> (J.R. & G.Forst.) Steph. var. <i>rupestre</i>		No	Perennial	Bryophyte
BARTRAMIACEAE	<i>Philonotis africana</i> (Müll.Hal.) Rehm ex Paris		No	Perennial	Bryophyte
BARTRAMIACEAE	<i>Philonotis dregeana</i> (Müll.Hal.) A.Jaeger		No	Perennial	Bryophyte
BARTRAMIACEAE	<i>Philonotis falcata</i> (Hook.) Mitt.		No	Perennial	Bryophyte
BRYACEAE	<i>Bryum alpinum</i> Huds. ex With.		No	Perennial	Bryophyte
BRYACEAE	<i>Bryum capillare</i> Hedw.		No	Perennial	Bryophyte
BRYACEAE	<i>Bryum pycnophyllum</i> (Dixon) Mohamed		No	Perennial	Bryophyte, epiphyte
CALYMPERACEAE	<i>Octoblepharum albidum</i> Hedw.		No	Perennial	Bryophyte, epiphyte
DICRANACEAE	<i>Leptotrichella minuta</i> (Hampe) Ochyra		No	Perennial	Bryophyte
EXORMOTHECACEAE	<i>Exormotheca holstii</i> Steph.		No	Perennial	Bryophyte
EXORMOTHECACEAE	<i>Exormotheca pustulosa</i> Mitt.		No	Perennial	Bryophyte
FISSIDENTACEAE	<i>Fissidens borgenii</i> Hampe		No	Perennial	Bryophyte, epiphyte
FISSIDENTACEAE	<i>Fissidens bryoides</i> Hedw.		No	Perennial	Bryophyte
FISSIDENTACEAE	<i>Fissidens sciophyllus</i> Mitt.		No	Perennial	Bryophyte
FOSSOMBRONIACEAE	<i>Fossombronia crispa</i> Nees		No	Perennial	Bryophyte
FOSSOMBRONIACEAE	<i>Fossombronia gemmifera</i> Perold		No	Perennial	Bryophyte
FOSSOMBRONIACEAE	<i>Fossombronia glenii</i> Perold		No	Perennial	Bryophyte
FOSSOMBRONIACEAE	<i>Fossombronia swaziensis</i> Perold		No	Perennial [No lifecycle defined]	Bryophyte
PARMELIACEAE	<i>Parmotrema austrosinense</i> (Zahlbr.) Hale		No		Lichen
POLYTRICHACEAE	<i>Pogonatum capense</i> (Hampe) A.Jaeger		No	Perennial	Bryophyte
POTTIACEAE	<i>Hypodontium dregei</i> (Hornsch.) Müll.Hal.		No	Perennial	Bryophyte, epiphyte

POTTIACEAE	Trichostomum brachydontium Bruch		No	Perennial	Bryophyte
RANUNCULACEAE	Ranunculus multifidus Forssk.		No	Perennial	Herb
RICCIACEAE	Riccia atropurpurea Sim		No	Perennial	Bryophyte
RICCIACEAE	Riccia congoana Steph.		No	Perennial	Bryophyte
RICCIACEAE	Riccia moenkemeyeri Steph.		No	Annual	Bryophyte
RICCIACEAE	Riccia natalensis Sim		No	Perennial	Bryophyte
RICCIACEAE	Riccia okahandjana S.W.Arnell		No	Perennial	Bryophyte
RICCIACEAE	Riccia rosea O.H.Volk & Perold		No	Perennial	Bryophyte
RICCIACEAE	Riccia stricta (Lindenb.) Perold		No	Perennial	Bryophyte, hydrophyte
RICCIACEAE	Riccia volkii S.W.Arnell		No	Annual	Bryophyte
SINOPTERIDACEAE	Cheilanthes hirta Sw. var. brevopilosa W.& N.Jacobsen forma laxa (Kunze) W.& N.Jacobsen		No	[No lifecycle defined]	[No lifeform defined]
SPHAGNACEAE	Sphagnum truncatum Hornsch.		No	Perennial	Bryophyte, hydrophyte

Annexure B

Curriculum Vitae

MARY-LEE POTGIETER *Cand.Sci.Nat.*

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PERSONAL INFORMATION

Date of Birth: 13 November 1987
ID: 8711130058088
Gender: Female
Citizenship: RSA
Driver license: Code B
Language: English
Afrikaans

ACADEMIC QUALIFICATIONS

Date: 2012
Degree: **MSc Plant Science** with specialisation in Plant Ecology
Title: Long-term monitoring of elephant impact on the woody vegetation in the Tembe Elephant Park, South Africa
Institution: University of Pretoria

Date: 2009
Degree: **BSc (Hons) Plant Science** (with distinction)
Institution: University of Pretoria
Subjects: Seed Ecology 714
General Plant Ecology 722
Environmental Impact and Auditing 785
Veld Evaluation and Management 781
Plant Community Ecology 721
Plant Dynamics and Phenology 787

Date: 2008
Degree: **BSc Ecology**
Institution: University of Pretoria

Date: 2005
Degree: **Senior Certificate** (with distinction)
Institution: Hoërskool Garsfontein
Subjects: Afrikaans (1st) English (2nd)
Mathematics (HG) Science (HG)
Biology (HG) Accounting (HG)

SHORT COURSES

Wetland Management: Rehabilitation Principles

University of the Free State – Centre for Environmental Management

Course attended 25 - 27 June 2012

ASSOCIATIONS

- ~ Registered as a Candidate Natural Scientist in the field of Ecological Science with the South African Council for Natural Scientific Professions (SACNASP)
- ~ Southern African Wildlife Management Association (SAWMA)
- ~ South African Association of Botanists (SAAB)

EXPERIENCE

BOKAMSOSO LANDSCAPE ARCHITECTS & ENVIRONMENTAL CONSULTANTS CC

February 2013 – Present

Environmental Consultant and Flora Specialist

- Conducting Flora studies for various Environmental Reports
- Compilation of Basic Assessments and Environmental Impact Assessments
- Conducting Environmental Compliance Monitoring and compiling the relevant reports

ENVIRONMENTAL CONSULTING (INDEPENDENT)

November 2012

- Compiling a wetland rehabilitation plan for a new development

GEM-SCIENCE CC

January 2012 – October 2012

Vegetation Specialist

- Contribute to report writing for documents such as Water Use License Application, Environmental Impact Assessments and Risk Assessments
- Compilation of flora/vegetation assessments (for EIA, EMP, Scoping reports, Risk Assessments and Basic Assessments)
- Constructing maps using ArcGIS
- Assisted with wetland assessments (Delineation, WET-health, Wet-EcoServices)
- Reviewing of environmental documents

NORTHERN GAUTENG EXPO FOR YOUNG SCIENTIST

August 2012; September 2011

Judge

- The projects, with relation to Botany, were evaluated based on creativity, presentation and scientific accuracy

UNIVERSITY OF PRETORIA

July – November 2011; July – November 2010

Botany Tutor

- Consulted students who had questions regarding the work discussed in the course
- Help out with practicals
- Assisted with invigilation during tests and exams

- Responsible for the marking of tests and exams

February 2011; February 2010; February 2009

Molecular and Cell Biology Demonstrator

- Assist students with questions regarding the microscopy practical as well as handling of the microscopes. Responsible for the marking of practical tests

July – November 2009

Botany demonstrator

- Assisted students during the practical with questions and experiments done
- Responsible for marking the practical tests

September 2008

Student

- Assisted in vegetation surveys in Sani Pass

37TH ANNUAL CONFERENCE OF THE SOUTH AFRICAN ASSOCIATION OF BOTANISTS (SAAB)

January 2011

Poster presentation: A long-term study of elephant utilisation in Tembe Elephant Park, South Africa

TEMBE ELEPHANT PARK

2010 - 2011

MSc Student (Researcher)

- Vegetation surveys were conducted to determine elephant impact; it included utilization assessment and the recording of canopy measurements
- Data were put into a database in order to compare it to different datasets obtained by other researchers

May 2010

Assistant

- Attended lion call-ups. Assisted in tracking of lions and attaching new collars

LOSKOP DAM NATURE RESERVE - ABEERU

April – May 2009

Honours Student (Researcher)

- Braun-Blanquet vegetation surveys were done to identify plant communities and veld evaluations were conducted as to determine grazing capacities within the different plant communities
- Plant specimens were collected and identified in the Schweickerdt Herbarium
- Animal sightings were also recorded to contribute to the study

April 2009

Field Assistant

Assisted in vegetation surveys for a fellow researcher doing Whittaker plots

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Geohydrological Investigation



Appendix G4

THANDAMANZI WATER USE CONSULTANTS
GEOHYDROLOGICAL INVESTIGATION FOR PURPOSES OF A WATER USE
LICENCE APPLICATION

GEOHYDROLOGICAL INVESTIGATION
AT
MLEKI'S BEEF FEEDLOT

AUGUST 2013

DOCUMENT NUMBER

109899	MLE	2013
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Compiled by

The logo for Aurecon, featuring a green leaf-like shape above the letter 'a' in the word 'aurecon', which is written in a bold, dark green, lowercase sans-serif font.

Project Title: Geohydrological Investigation at Mleki's Beef Feedlot

Location: Cullinan, Gauteng Province

Co-ordinates (WGS84): S 25.61884⁰
E 28.64058⁰

Prepared for: Thandamanzi Water Use Consultants
PO Box 11375
Maroelana
0161

Contact person: Marli Burger
Tel No: 012 346 3810

Compiled by: Aurecon
Lynnwood Bridge Office Park
4 Daventry Street
Lynwood Manor
0081

Contact Person: Louis Stroebele
Tel No: 012 427 3151

Project team: L Stroebele Geohydrologist
M Terblanche Geotechnician

**Signed on behalf of
Aurecon:**



L Stroebele

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EXECUTIVE SUMMARY

Thandamanzi Water Use Consultants appointed Aurecon to perform a geohydrological investigation at the proposed Mleki's Beef Feedlot, located on Portion 47 of the farm Brandbach 471 JR. The objective of the geohydrological investigation is to evaluate the existing groundwater resources on the property and to perform a Rapid Reserve Determination in support of a Water Use License Application (WULA) to the Department of Water Affairs (DWA). The water use activities at the proposed feedlot need to be authorized in terms of Section 21 of the National Water Act (NWA), 1998 (Act 36 of 1998).

The investigations consisted of the following:

1. Desk study & Site Visit
2. Hydrocensus
3. Pumptesting of the existing production borehole
4. Aquifer Classification
5. Rapid Reserve Determination
6. Groundwater Management Framework & Groundwater Monitoring Program

Based on the existing data and newly acquired data, the following can be concluded:

- According to the published 1:250 000 geological map (2528 Pretoria) the project area is underlain by the Wilgeriver Formation of the Waterberg Group. According to this map, a diabase intrusion, most probably in the form of a sill, occur to the west of the property. No linear structures or faults in close proximity to the proposed feedlot are shown.
- A hydrocensus was carried out on the 13th of August 2013 on the property earmarked for the proposed feedlot, as well as the adjacent area to identify legitimate groundwater users, the groundwater potential and quality. Boreholes are used for various agricultural and domestic applications. Boreholes with significant yields exist within the project area (ranging from 3000 to 81 000 litres/hour with an average yield of 16 000 litres/hour).
- Due to the site's close proximity to the Malanspruit, a relatively shallow water table can be expected. This was confirmed by the water level measured in the boreholes identified during the hydrocensus (the majority of the boreholes having a static water level < 6 meters below ground level). It can be assumed that the regional groundwater flow direction will emulate to local topography. Groundwater flow will thus be in a north and north-easterly direction towards the Malanspruit.
- The existing production borehole on the farm was scientifically pumptested and it was calculated that a total volume of 1296 m³/month (15552 m³/annum) can be abstracted from the tested borehole.
- Water samples were collected from the existing production borehole, as well as selected boreholes identified during the hydrocensus. The water quality in all of the sampled boreholes can be classified as Class 1 and is fit for human consumption.
- Based on information collected during the hydrocensus it can be concluded that the aquifer system in the study area can be classified as a "Major Aquifer System". The local population and farms make use of groundwater as a source of potable water and borehole yields and water quality are generally good. One can also assume that the aquifer is

important for supplying base flow to the local rivers and their tributaries. Consequently, high level groundwater protection may be required.

- The results of the Reserve Determination Study revealed that the local recharge on the property will allow for abstraction of ~ 287 820 m³/annum. There will be applied for an abstraction of 276 000 m³/annum from the total registered property. The recharge calculations (abstraction being 96% of the local recharge) places the application in Category B (medium scale abstraction – 60 to 100 % abstraction of the recharge on the registered property).
- It is important to note that the existing production borehole on the farm (MBH1) will not supply in the volume of water applied for in the Water Use Licence. A groundwater exploration program will have to be embarked upon to geophysically site, drill and pump test additional boreholes.

Based on the above conclusions, the following recommendations are made:

- Uncontrolled and poor management practices of feedlots may pose a significant threat to water resource quality, particularly from nutrient-rich wastewater entering surface and groundwater bodies. In order to mitigate potential contamination of the aquifers underlying the study area, a groundwater management program needs to be developed and implemented as part of the environmental management program.
- As part of the groundwater management program, a groundwater monitoring program should be implemented to monitor the impact of the proposed feedlot on the hydrogeological environment. Should it become evident from the monitoring program that pollution of the groundwater occurs, corrective and remedial actions should be implemented.

1 INTRODUCTION

Thandamanzi Water Use Consultants appointed Aurecon to perform a geohydrological investigation at the proposed Mleki's Beef Feedlot, located on Portion 47 of the farm Brandbach 471 JR. The objective of the geohydrological investigation is to evaluate the existing groundwater resources on the property and to perform a Rapid Reserve Determination in support of a Water Use License Application (WULA) to the Department of Water Affairs (DWA). The water use activities at the proposed feedlot need to be authorized in terms of Section 21 of the National Water Act (NWA), 1998 (Act 36 of 1998).

The investigations consisted of the following:

1. Desk study & Site Visit
2. Hydrocensus
3. Pumptesting of the existing production borehole
4. Aquifer Classification
5. Rapid Reserve Determination
6. Groundwater Management Framework & Groundwater Monitoring Program

2 METHODOLOGY

The work completed for the purposes of compiling a geohydrological report comprised the following:

2.1 Desk Study & Site Visit

All existing and published data as well as data from the client was collated. Aerial photos and geological maps were studied to identify possible structural features. This data was used to familiarise ourselves with the site conditions and project objectives. A site visit was conducted to evaluate the geology, geohydrology and potential receptors of possible groundwater pollution emanating from the proposed development.

2.2 Hydrocensus

A hydrocensus was carried out on the property, as well as the adjacent area to identify legitimate groundwater users, the groundwater potential and quality. Where possible, groundwater levels were also measured to assist in the understanding of groundwater flow at the site.

2.3 Pumptesting

A 24 hour constant discharge test followed by recovery monitoring was conducted on the existing production borehole (MB-BH1). The data was scientifically analysed to determine the sustainable yield of this borehole. A groundwater sample was collected towards the end of the constant discharge test for a major inorganic analysis.

2.4 Rapid Reserve Determination

The "Reserve" and groundwater available for abstraction was calculated through a "Rapid Reserve Determination" using the "Groundwater Resources Directed Measures" software developed by the DWA.

2.5 Aquifer Classification

The aquifer(s) underlying the project area was classified in accordance with “A South African Aquifer System Management Classification” developed by the Water Research Commission and the DWA.

2.6 Reporting

Upon completion of the desk study, pumptesting and reserve determination, a document was compiled summarising the findings of the investigation.

3 AVAILABLE INFORMATION

The following information was available and was used in the investigation:

- 1:250 000 Geological Map (2528 Pretoria).
- 1:500 000 Hydrogeological Map (Johannesburg 2526).
- An Explanation of the 1:500 000 General Hydrogeological Map – Johannesburg 2526. HC Barnard, October 2000.
- R Parsons (1995). “*A South African Aquifer System Management Classification*”. Water Research Commission. Report No KV 77/95.

4 PHYSIOGRAPHY

4.1 Site Location

The site is located approximately 13 km north-east of the town of Cullinan and is accessible from the R875 district road (Map 1, Appendix A). The adjacent land-use mainly comprise of farmland where agricultural activities are practised.

4.2 Topography & Drainage

Local drainage from the proposed feedlot will be in a north and north-easterly direction (0.02 or 2%) towards the Malanspruit which flows in a north-westerly direction which eventually flows into the Elands River.

4.3 Geology & Hydrogeology

According to the published 1:250 000 geological map (2528 Pretoria) the property is underlain by the Wilgeriver Formation of the Waterberg Group (Map 2, Appendix A). According to this map, a diabase intrusion, most probably in the form of a sill, occur to the west of the property. No linear structures or faults in close proximity to the proposed feedlot are shown.

According to Barnard (2000), the Wilgeriver Formation consists predominantly of reddish-brown to purple sandstone, grit and quartzitic sandstone with intercalations of conglomerate and shale. These rocks types are to a large extent intruded by diabase sills and dykes that play a major role in the occurrence of groundwater. Groundwater occurrence is also commonly associated with fault and fracture zones and with bedding planes.

The groundwater potential generally is classed as low to moderate on the basis that 80% of boreholes on record produce less than 2 l/s. The depth to groundwater level commonly occurs between 10 and 40 m below surface.

The chemical data indicate that the quality of the groundwater in terms of salinity is generally excellent and suitable for all use (average EC value of 26 mS/m). Elevated nitrate and fluoride concentrations however have been recorded in a number of boreholes making it unfit for human consumption.

Due to the site's close proximity to the Malanspruit, a relatively shallow water table can be expected. This was confirmed by the water level measured in the boreholes identified during the hydrocensus (the majority of the boreholes having a static water level < 6 meters below ground level).

It can be assumed that the regional groundwater flow direction will emulate to local topography. Groundwater flow will thus be in a north and north-easterly direction towards the Malanspruit.

5 GROUNDWATER USE

A hydrocensus was carried out on the 13th of August 2013 on the property earmarked for the proposed feedlot, as well as the adjacent area to identify legitimate groundwater users, the groundwater potential and quality. The hydrocensus extended to a distance of ~1km from the site, except where a river or a surface water body exist. The hydrocensus did not extend past such a feature as surface water bodies are usually hydraulically connected to an aquifer, acts as a constant-head boundary and a groundwater pollution plume would theoretically not extend past a constant head boundary.

A total of 13 boreholes were identified and where possible, water samples were collected from the boreholes and submitted to Aspirata (SANAS accredited laboratory) for a major cation/anion analysis. The results of the water quality are discussed in detail in Section 7.

The location of the boreholes is indicated in Map 3, Appendix A. Table 1 summarises the most important details of the boreholes identified during the hydrocensus. A complete summary of the hydrocensus results are presented in Appendix B.

Table 1. Details of boreholes identified during hydrocensus

BH nr.	Coordinates (decimal degrees) (WGS84)		Owner/Contact details		Static water level (#mbgl)	Estimated Yield (liters/hour)	User application
MBBH1	25.61884	28.64058	Mleki Beef	079 831 3692	22.30	3 000	Stock Watering
MBBH2	25.61878	28.65616	Bongi Mbobane	0724704402	5.58	~	Not in use
MBBH3	25.61481	28.65632	Ezekiel Mkabela	0797463830	BH Sealed	3 000	Domestic
MBBH4	25.60869	28.63528	Dick von Staden	0824990120	BH Sealed	4 000	Domestic
MBBH5	25.60806	28.63565	Dick von Staden	0824990120	1.07	4 000	Not in use
MBBH6	25.60891	28.63313	Dick von Staden	0824990120	BH Sealed	12 000	Domestic
MBBH7	25.60830	28.63416	Dick von Staden	0824990120	3.20	300	Not in use
MBBH8	25.60651	28.63287	Premier Farms Manuel	0725630033	1.69	81 000	Irrigation
MBBH9	25.60646	28.63289	Premier Farms Manuel	0725630033	BH Sealed	16 000	Irrigation
MBBH10	25.60603	28.62066	Lytton Sadomba	0718696137	4.9 (pumping)	25 000	Irrigation/ Domestic
MBBH11	25.60609	28.62106	Lytton Sadomba	0718696137	BH Sealed	2 000	Domestic
MBBH12	25.60657	28.62006	Lytton Sadomba	0718696137	~	~	Rock filled
MBBH13	25.62781	28.65069	Unknown	~	5.80	500	Not in use

#mbgl - meters below ground level

From Table 1 the following can be concluded:

- Boreholes are used for various agricultural and domestic applications.
- Boreholes with significant yields exist within the project area (ranging from 3000 to 81 000 litres/hour with an average yield of 16 000 litres/hour)
- The static water level as measured within the boreholes during the hydrocensus ranges between 22.3 and 1.07 meters below ground level with the majority of the boreholes having a static water level of less than 6 meters below ground level.

6 PUMPTESTING

6.1 Description of a Pumptest

The efficient operation and utilisation of a borehole requires insight into and an awareness of its productivity and that of the groundwater resource from which it draws water. This activity, which is also known as test pumping, provides a means of identifying potential constraints on the performance of a borehole and on the exploitation of the groundwater resource. It also provides data to calculate aquifer parameters such as Transmissivity (T) values.

The existing borehole at Mleki's Beef (MBBH1) was test pumped by Trans Africa Water Services. The location of the borehole is presented in Map 3 in Appendix A and borehole test records giving testing and construction details of the borehole is presented in Appendix E.

The following tests were performed on the borehole: (1) stepped discharge test; (2) constant discharge test and (3) recovery monitoring.

6.1.1 Stepped Discharge Test

Also known as a step drawdown test, it is performed to assess the productivity of a borehole. It also serves to more clearly define the optimum yield at which the borehole can be subjected to constant discharge testing. The test involves pumping the borehole at three or more sequentially higher pumping rates each maintained for an equal length of time, generally not less than 60 minutes. The magnitude of the water level drawdown in the borehole in response to each of these pumping rates is measured and recorded in accordance with a prescribed time schedule.

6.1.2 Constant Discharge Test

A constant discharge test is performed to assess the productivity of the aquifer according to its response to the abstraction of water. This test entails pumping the borehole at a single pumping rate which is kept constant for an extended period of time. In this instance the boreholes were pumped for 24 hours.

6.1.3 Recovery Monitoring

This test provides an indication of the ability of a borehole and groundwater system to recover from the stress of abstraction. This ability can again be analysed to provide information with regards to the hydraulic properties of the groundwater system and arrive at an optimum yield for the medium to long term utilisation of the borehole.

6.2 Results & Data Processing

The data recorded during the pump test were processed and the sustainable yield of the borehole was calculated using the Flow Characterization Method (FC-Method) developed by the Institute for Groundwater Studies from the University of the Free State.

6.2.1 Sustainable Yield

The FC-Method calculates the sustainable yield of a borehole by using derivatives, boundary information and error propagation. Data used for input into the software was obtained from the pumping test conducted on the borehole. As described above a pump test basically entails continues monitoring of the water level over a given time while pumping water from the borehole at a constant pre-determined yield. After the pump has been switched off, continues measuring of the recovering water level takes place. The aquifer was then modelled to obtain a sustainable

pumping yield. The available drawdown is a critical parameter during this exercise and after calculating the sustainable yield, the water level should never drop beyond this level.

The FC Solution for the borehole is presented in Appendix C.

The calculated sustainable yield for the borehole is presented in Table 1.

Table 2. Calculated Sustainable Yield for the tested borehole

BH nr.	Coordinates (WGS84)	Depth (m)	Static water level (mbcl)	Sustainable Yield (l/s) Pumping 24 h/d	Volume available per day (m ³)
MBH1	S 25.61884 E 28.64058	120	22.30	0.5	43.2
Total volume available from borehole (m ³ /month)					<u>1296</u>

From Table 1 it can be concluded that a total volume of 1296 m³/month (15552 m³/annum) can be abstracted from the tested borehole.

7 GROUNDWATER CHEMISTRY

Groundwater samples (pumped where possible) were collected for chemical analysis from boreholes identified during the hydrocensus on the 13th of August 2013. The groundwater samples were submitted to an accredited laboratory (*Aspirata in Centurion*) for a major cation/anion analysis, as well as selected trace metals. The laboratory reports are attached in Appendix D.

The analytical results were compared with the SABS drinking water standards (SANS 241:2006, edition 6.1) (Table 3). Water is classified according to their suitability for human consumption:

- Class I: Recommended operational limit.
- Class II: Maximum allowable concentration for short term use only.

Table 3. Chemical parameters compared to SANS 241:2006 (edition 6.1) drinking water standards

Sample Nr.	MBBH1	MBBH3	MBBH6	MBBH9			Class I	Class II
Ca	7.38	6.41	9.68	6.57			150	300
Mg	4.39	1.37	3.15	1.10			70	100
Na	12.67	49.87	29.14	46.92			200	400
K	3.25	1.67	1.24	1.13			50	100
Mn	0.0014	0.0006	0	0.0117			0.1	1
Fe	0.0053	0.0159	0	0			0.2	2
F	0	0	0	0			1	1.5
NO ₃ -N	0.37	0	1.15	0.06			10	20
NH ₄ -N	0	0	0	0			0.94	1.87
Cl	1	5	2	2			200	600
SO ₄	0	0	0	12			400	600
TDS	86	170	127	160			1000	2400
pH	7.54	8.82	7.97	8.74			5.0 - 9.5	4.0 - 10.0
EC	13	27	20	25			150	370
Notes								
Yellow = Class I								
Tan = Class II								
exceeds maximum allowable drinking water standard								
analysed								
0 = below detection limit of analytical technique								

EC measurements in mS/m, other parameters in mg/l

From Table 3 it can be concluded that the water quality in all of the sampled boreholes can be classified as Class 1 and is fit for human consumption.

8 RAPID RESERVE DETERMINATION

8.1 Introduction

Definition of Reserve: *“The quantity and quality of water required to supply basic needs of people to be supplied with water from that resource and to protect aquatic ecosystems in order to secure ecologically sustainable development and use of water resources”.*

To be able to quantify the groundwater component of the Reserve, the following relationship has to be solved:

$$GW_{\text{allocate}} = (\text{Re} + GW_{\text{in}} - GW_{\text{out}}) - \text{BHN} - GW_{\text{Bf}}$$

where:

GW_{allocate}	=	groundwater allocation
Re	=	recharge
GW_{in}	=	groundwater inflow
GW_{out}	=	groundwater outflow
BHN	=	basic human needs
GW_{Bf}	=	groundwater contribution to baseflow

Under the National Water Act (Act No. 36 of 1998) the water use at the proposed Mleki's Beef Feedlot must be authorised. The water will be abstracted from a borehole(s), stored in a reservoir and used for stock watering in a commercial feedlot. Under these circumstances, the following (ground) water use is recognised as being relevant to the licence application:

- Section 21 (a) – taking water from a resource.

8.2 Approach

The assessment was done on a “rapid” level using the software GRDM version 4.0.0.0 (2010). The data used for the calculation was derived from the WRC90 dataset contained in the “GRDM” software driven by the Resource Directed Measures from the Department of Water. The local catchment falls within quaternary catchment B31A. The default values were used in the assessment in order to develop some guidance on the potential impact of the proposed abstraction on the overall groundwater use in the catchment.

8.3 Description of the Study Area

The property (Portion 47 of the farm Brandbach 471JR), hereafter referred to as Mleki's Beef Feedlot has a total area of 533 ha and falls within quaternary catchment B31A. The quaternary catchment B31A has a total area of 387 km² of which 2 km² is protected (Magaliesberg Range), leaving an effective area of 385 km². The study area falls in the Olifants Water Management Area.

The dominant vegetation type is Mixed Bushveld. The area has a sloping topography and is drained by surface runoff towards the Malanspruit which flows in a north-westerly direction which eventually flows into the Elands River.

8.4 Present Water Demand

A conservative projection of the planned water demand at the end of the project is 23 000 m³/month or 276 000 m³/annum. DWA categorises the water use licence applications in 3 categories based on the amount of recharge that is used by the applicant in relation to the specified property:

- Category A: Small scale abstractions (<60% recharge on property)
- Category B: Medium scale abstractions (60-100% recharge on property)
- Category C: Small scale abstractions (>100% recharge on property)

8.5 RDM Assessment

The following table summarises the most salient parameters relevant to this catchment (B31A):

Table 4. Most salient parameters relevant to catchment B31A.

Area km ²	Population	General Authorisation (m ³ /ha/a)	Rainfall (mm/a)	Current use (Mm ³ /a)
385	7261	75	677	0.14

It is assumed that General Authorisation as a possible route can be excluded.

8.5.1 Classification

Groundwater classification is currently based on a Stress Index which relates water use to recharge. The study area is classified as category A, which indicates unstressed or low levels of stress in terms of abstraction/recharge. The resource is still being used sustainably. At this stage Classification is not directly linked to potential abstraction, but is only indicative of the current situation. A category C classification still implies that ~8.5 (Mm³/a) can still be abstracted from the quaternary catchment before very detailed studies will be required.

8.5.2 Reserve

The following table summarizes the Reserve for the catchment.

Table 5. A summary of the Reserve for the catchment.

Quantification of Reserve: B31A	
Human Need:	
Population	7261
Basic human need [l/d/p]	25
Basic human need total [Mm ³ /a]	0.07
Recharge:	
Recharge [Mm ³ /a]	21.32
Baseflow:	
Baseflow [Mm ³ /a]	3.00
<input checked="" type="checkbox"/> Maint. low flow [Mm ³ /a]	3.00
<input type="checkbox"/> EWR [Mm ³ /a]	0.00
Flow:	
Net Flow [Mm ³ /a]	0.00
Reserve:	
Reserve as % recharge	14.4
Groundwater allocation [Mm ³ /a]	18.25
Current abstraction [Mm ³ /a]	0.14

The allocatable portion is still very high, with the greatest impact coming from base flow. If this calculation is done based on the actual area of the property, the following emerges:

Table 6. Recharge to Mleki’s Beef Feedlot

Catchment	Actual area (ha) of property	Recharge in Quaternary Catchment (mm/a)	Recharge on property
B31A	533	54	287820 m ³ /a
Total	533		287820 m³/a
			0.288 Mm³/a
			788548 l/day
			9.1 l/second

From this it is evident that local recharge (287 820 m³/annum) will not supply in the allocatable portion (18.25 Mm³/annum) for the quaternary catchment B31A. **The local recharge on the property will allow for abstraction of ~ 287 820 m³/annum.** There will be applied for an abstraction of 276 000 m³/annum from the total registered property. The recharge calculations

(abstraction being 96% of the local recharge) places the application in Category B (medium scale abstraction – 60 to 100 % abstraction of the recharge on the registered property) (see section 8.4).

8.5.3 Resource Quality Objectives

Maintain regional groundwater table to:

- Ensure that Schedule 1 water users adjacent to the site have adequate water supply to sustain the basic human need.
- Ensure that adequate water is available to maintain base flow in rivers and streams.

9 AQUIFER CLASSIFICATION

The aquifer(s) underlying the project area were classified in accordance with “A South African Aquifer System Management Classification, December 1995” by Parsons. Classification has been done in accordance with the following definitions for Aquifer System Management Classes:

- Sole Aquifer System: An aquifer which is used to supply 50% or more of domestic water for a given area, and for which there is no reasonably available alternative sources should the aquifer be impacted upon or depleted. Aquifer yields and natural water quality are immaterial.
- Major Aquifer System: Highly permeable formations, usually with a known or probable presence of significant fracturing. They may be highly productive and able to support large abstractions for public supply and other purposes. Water quality is generally very good (Electrical Conductivity of less than 150 mS/m).
- Minor Aquifer System: These can be fractured or potentially fractured rocks which do not have a high primary permeability, or other formations of variable permeability. Aquifer extent may be limited and water quality variable. Although these aquifers seldom produce large quantities of water, they are important for local supplies and in supplying base flow for rivers.
- Non-Aquifer System: These are formations with negligible permeability that are regarded as not containing groundwater in exploitable quantities. Water quality may also be such that it renders the aquifer unusable. However, groundwater flow through such rocks, although imperceptible, does take place, and needs to be considered when assessing the risk associated with persistent pollutants.

Based on information collected during the hydrocensus it can be concluded that aquifer system in the study area can be classified as a “Major Aquifer System”. The local population and farms make use of groundwater as a source of potable water and borehole yields and water quality are generally good. One can also assume that the aquifer is important for supplying base flow to the local rivers and their tributaries. In order to achieve the Groundwater Quality Management Index a points scoring system as presented in Table 7 and Table 8 was used.

Table 7. Ratings for the Aquifer System Management and Second Variable Classifications:

Aquifer System Management Classification		
Class	Points	Study area
Sole Source Aquifer System:	6	4
Major Aquifer System:	4	
Minor Aquifer System:	2	
Non-Aquifer System:	0	
Special Aquifer System:	0 – 6	
Second Variable Classification (Weathering/Fracturing)		
Class	Points	Study area
High:	3	2
Medium:	2	
Low:	1	

Table 8. Ratings for the Groundwater Quality Management (GQM) Classification System:

Aquifer System Management Classification		
Class	Points	Study area
Sole Source Aquifer System:	6	4
Major Aquifer System:	4	
Minor Aquifer System:	2	
Non-Aquifer System:	0	
Special Aquifer System:	0 - 6	
Aquifer Vulnerability Classification		
Class	Points	Study area
High:	3	2
Medium:	2	
Low:	1	

The occurring aquifer(s), in terms of the above definitions, is classified as a major aquifer system.

The vulnerability, or the tendency or likelihood for contamination to reach a specified position in the groundwater system after introduction at some location above the uppermost aquifer, in terms of the above, is classified as medium. A relatively shallow water table (~6 mbgl) and rocks with moderately weathering underlie the site. The level of groundwater protection based on the Groundwater Quality Management Classification:

$$\begin{aligned} \text{GQM Index} &= \text{Aquifer System Management} \times \text{Aquifer Vulnerability} \\ &= 4 \times 2 = 8 \end{aligned}$$

Table 9. GQM index for the study area

GQM Index	Level of Protection	Study Area
<1	Limited	8
1 - 3	Low Level	
3 - 6	Medium Level	
6 - 10	High Level	
>10	Strictly Non-Degradation	

9.1 Aquifer Susceptibility

Aquifer susceptibility, a qualitative measure of the relative ease with which a groundwater body can be potentially contaminated by anthropogenic activities and which includes both aquifer vulnerability and the relative importance of the aquifer in terms of its classification, in terms of the above, is classified as high.

9.2 Aquifer Protection Classification

The ratings for the Aquifer System Management Classification and Aquifer Vulnerability Classification yield a Groundwater Quality Management Index of 8 for the study area, indicating that high level groundwater protection may be required.

Due to the high GQM index calculated for this area, a high level of protection is needed to adhere to the Department of Water Affairs (DWA) water quality objectives. Reasonable and sound groundwater protection measures are recommended to ensure that no cumulative pollution affects the aquifer, even in the long term.

In terms of DWA's overarching water quality management objectives which is (1) protection of human health and (2) the protection of the environment, the significance of this aquifer classification is that if any potential risk exist, measures must be triggered to limit the risk to the environment, which in this case is the (1) protection of the Secondary Underlying Aquifer, (2) the Malanspruit and its tributaries which drains the subject area and (3) the external users of groundwater in the area.

10 GROUNDWATER MANAGEMENT FRAMEWORK

The disposal of animal wastes from intensive farming activities such as feedlots gives rise to concerns about nutrients and microorganisms entering the soil, groundwater and water courses through run-off. Inappropriate siting and poor management practices of feedlots may pose a significant threat to water resource quality, particularly from nutrient-rich wastewater entering surface and groundwater bodies in the following ways:

- Runoff from feedlots may percolate into groundwater,
- In manure storage areas, leachate may move through stacked manure to groundwater,
- Manure applied to land also has the potential to affect groundwater, especially if over-applied.

It is stated in several DWA publications, such as main policy documents¹, requirements of waste handling² and pollution prevention guidelines³, that waste should be reduced to the minimum and pollution should preferably be prevented at the source. Should this fail, impacts must be minimised by reuse, reclamation and treatment. In the last instance, waste water can be discharged on a risk based approach, but at the cost of polluter pays principle. A groundwater framework for the proposed Mleki's Beef Feedlot was drafted to address and adhere to these principles.

Objectives:

- Minimisation of waste.
- Contain pollution as far as is practicably possible at the feedlot.
- Reduce the level of contamination outside the feedlot boundaries.
- Adopt a user driven approach for the ground water quality.
- Implement a suitable ground water monitoring programme (section 11).

The use of feedlot wastes to supplement the nutrient requirements of pasture and crops is an environmentally acceptable practice, if managed effectively to minimise potential impact to water quality.

¹ Department of Water Affairs and Forestry, Number W.1.0: First Edition 2000. Policy and Strategy for Groundwater. Quality Management in South Africa.

² Department of Water Affairs and Forestry, Second Edition, 1998. Waste Management Series. Minimum Requirements for Water Monitoring as Waste Management Facilities.

³ Department of Water Affairs and Forestry, 2007. Best Practice Guideline H2: Pollution Prevention and Minimisation of Impacts.

Table 10. Groundwater Management Framework for the proposed Mleki's Beef Feedlot

Action	Objective	Management & Mitigation
Solid waste management	Prevent contamination of surface or groundwater resources	<p><u>Removal and storage of solid waste.</u> Most of the manure from cattle lot-fed in paddocks for relatively short periods is incorporated into the soil and the cattle should be periodically rotated between paddocks to ensure the manure loading is not excessive. Manure from intensive feedlots, where the cattle are confined in high densities or on hard stand for extended periods, should be scraped up and removed as necessary. The frequency with which pens are cleaned will depend on factors such as the stocking density and the size of the animals. Manure should be stored in a stockpile on an impervious surface where water from rain, sprinklers or surface drainage cannot access the manure (or where any run-off drains back to holding ponds). Manure can be stored for an extended period until it is used on the farm or is removed off-site for use or disposal in a manner approved by the relevant legislative body. A low moisture content in the manure will minimise odour and generation of leachate. Aerobic composting of the manure (in turned piles or rows) may be used to stabilise the waste and reduce the incidence of disease-causing organisms.</p> <p><u>Disposal of solid waste over land.</u> The soil where solid feedlot waste is to be spread needs to be suitable for, and able to sustain, the agronomic regimes proposed. The disposal area also needs to be able to accommodate the water, nutrient, salt and organic loads involved. Land application should be timed to promote most benefit to site vegetation and minimise leaching of nutrients to surface and groundwater. Manure should be incorporated into the soil where possible. Otherwise, manure should be spread evenly over the land surface using a manure spreader of suitable design. Vegetation cover should be maintained on the disposal area to prevent soil erosion and to enhance nutrient uptake.</p>

Action	Objective	Management & Mitigation
Liquid waste management	Nutrient-rich wastewater should not contaminate any surface water body or groundwater resource.	<p><u>Removal of liquid waste.</u> Clean stormwater should be channelled away from the feedlot area, using bunds, culverts or drains, to ensure it does not become contaminated with manure or urine. Any contaminated water from areas outside the feedlot, including stormwater run-off, should (wherever possible) be directed via drains to a settling pond lined with very low permeability clay or plastic. This water should then be suitable for discharge to an irrigation area. Surface run-off from the feedlot should be collected in a drainage channel, with a sufficient cross-section. To prevent effluent being washed into a watercourse, all contaminated flows should be directed to stabilisation ponds for treatment before being spread over land by tanker or irrigation. Where liquid and solid waste combine and drain to a pond, effluent treatment is recommended using a multi-pond stabilisation system, incorporating anaerobic and aerobic treatment.</p> <p><u>Storage of liquid waste in settling ponds</u></p> <ul style="list-style-type: none"> • Where possible, solids and larger suspended matter should be removed from the effluent stream by the use of coarse screening equipment prior to entering a settling pond. • The capacity of any settling pond should provide adequate retention time for entrained solids to settle out (one and a half to two hours are normally satisfactory). • Adequate free board should be provided to prevent stormwater overflowing from the pond. The outflow from the settling pond should be conveyed either to a holding pond before irrigation over land or to wastewater stabilisation ponds. Captured solids should be applied to land in a sustainable manner using crop nutrient needs and status of soil. The nutrient loading to land is a cumulative loading from all sources, i.e. solid manures, liquids and any artificial fertiliser added. <p><u>Disposal of liquid waste over land.</u> In some instances, it may be possible to retain all liquid waste for evaporation in shallow ponds. Liquid waste can be disposed of raw or after treatment (e.g. by ponding). Treatment will reduce the Biological Oxygen Demand (BOD) of the effluent and will allow the waste to be</p>

		<p>applied over a much smaller area due to reduced odours. The waste disposal area should be located at such a distance that it would not contaminate surface and groundwater resources. Where wastewater is irrigated over aquifers, monitoring may be required to allow early detection and management of adverse environmental impacts. Sufficient land disposal area should be available for a 10 to 14-day rest period between applications on any given part of the area, the objective being to alternate between anaerobic and aerobic conditions in the top layer of soil. Shorter periods may be acceptable under dry summer conditions. Crops or pasture should be maintained to take up as much as possible of the nitrogen and phosphorus from the wastewater to prevent pollution of any ground or surface waters and minimise erosion.</p> <p>Irrigation systems may include (1) Flood irrigation, (2) Sprinkler irrigation and (3) Trickle irrigation. The latter is generally not suitable for effluent, due to clogging problems.</p>
Dead stock management	Prevent contamination of soil and groundwater resources	<p>Delivery of dead animals to a rendering plant is the preferred disposal method. However, in many areas of the country, a rendering service is not available. Cattle owners should then use burial pits for disposal of dead animals in accordance with local government requirements. They should be sited and constructed as follows:</p> <ul style="list-style-type: none"> • Locate the pit at least 100 metres from boreholes, streams and surface water bodies; • Use areas with clay soil if possible; • Construct the pit so that the bottom is at least 1.5 metres above seasonal high water table; • Pits should be covered with a minimum of one metre of earth after use; and • Distribute pits throughout the property, if more than one pit is required.
Fuel Storage	Prevent contamination of soil, surface and groundwater resources	<p>Fuel containers exceeding 200 litres capacity should be stored in a manner that will prevent escape of contents to the environment in the case of accidents. Fuel containers should be stored in a secure weatherproof building or within a secondary containment compound. Above and underground ground fuel storage installations should adhere to the relevant SABS specifications</p>

Action	Objective	Management & Mitigation
Quantify & verify the impact of the activities on the groundwater environment.	Implement a ground water monitoring programme (see section 11)	<ul style="list-style-type: none">• Monitor the water quality and water levels of the sampling points as mentioned in Section 11.• Audit the suitability of monitoring network annually.• Maintain the groundwater water monitoring network.
	General	<ul style="list-style-type: none">• Address the concerns and complaints of affected parties regarding the ground water issues.• All remedial action should be done in close liaison with the Department of Water Affairs.• The liabilities and proposed preventative and remedial actions will also have to be quantified.• Ensure that all surface water and storm water related EMP's are adhered to.

11 GROUNDWATER MONITORING PROGRAM

A groundwater monitoring network has been developed for the proposed Mleki's Beef Feedlot, incorporating selected boreholes identified during the hydrocensus, as well as the existing production borehole present on the property. It is important to note that a groundwater-monitoring network should be dynamic. This means that the network should be extended over time to accommodate the migration of contaminants through the aquifer as well as the expansion of infrastructure and/or addition of possible pollution sources.

Table 11. Monitoring boreholes to be included into the monitoring program

Borehole	Objective
MBH1	Downstream from the proposed feedlot. Impact Monitoring.
MBH2	Downstream from the proposed feedlot. Impact Monitoring.
MBH3	Downstream from the proposed feedlot. Impact Monitoring.
MBH4	Downstream from the proposed feedlot. Impact Monitoring.
MBH6	Downstream from the proposed feedlot. Impact Monitoring.
MBH10	Upstream from the proposed feedlot. Background Monitoring.

Water samples must be taken from all the monitoring boreholes by using approved sampling techniques and adhering to recognised sampling procedures. Table 12 below presents the parameters and frequency that should form part of the groundwater monitoring program. The results should be recorded on a data base and reported annually to the Department of Water Affairs.

Table 12. Proposed monitoring requirements

Class	Parameter	Frequency	Motivation
Physical	Static groundwater levels	Monthly	Time dependant data is required to understand the groundwater flow dynamics of the site. An anomaly in static water levels caused by mounding below the drainage field may give early warning to spillages or leakages from lined/unlined facilities.
	Rainfall	Daily	Recharge to the saturated zone is an important parameter in assessing groundwater vulnerability. Time dependant data is required to understand the groundwater flow dynamics of the site.
	Groundwater abstraction rates	Monthly	Response of groundwater levels to abstraction rates could be useful to calculate aquifer storativity – important for groundwater management. Could also explain anomalous groundwater level measurements. Requirement of the Water Use Licence.
Chemical	Major chemical parameters: Ca, Mg, Na, K, NO ₃ , NH ₄ , SO ₄ , PO ₄ , Cl, Fe, Mn, F, Alkalinity, pH, EC, TDS, COD, BOD.	Quarterly (Jan., Apr., Jul., Sept) May be reduced to bi-annual (April & Sept.) as more data becomes available)	Background information is crucial to assess impacts during operation and thereafter. Changes in chemical composition may indicate areas of groundwater contamination and be used as an early warning system to implement management/remedial actions. Requirement of the Water Use Licence.

12 CONCLUSIONS & RECOMMENDATIONS

Based on the existing data and newly acquired data, the following can be concluded:

- According to the published 1:250 000 geological map (2528 Pretoria) the project area is underlain by the Wilgeriver Formation of the Waterberg Group. According to this map, a diabase intrusion, most probably in the form of a sill, occur to the west of the property. No linear structures or faults in close proximity to the proposed feedlot are shown.
- A hydrocensus was carried out on the 13th of August 2013 on the property earmarked for the proposed feedlot, as well as the adjacent area to identify legitimate groundwater users, the groundwater potential and quality. Boreholes are used for various agricultural and domestic applications. Boreholes with significant yields exist within the project area (ranging from 3000 to 81 000 litres/hour with an average yield of 16 000 litres/hour).
- Due to the site's close proximity to the Malanspruit, a relatively shallow water table can be expected. This was confirmed by the water level measured in the boreholes identified during the hydrocensus (the majority of the boreholes having a static water level < 6 meters below ground level). It can be assumed that the regional groundwater flow direction will emulate to local topography. Groundwater flow will thus be in a north and north-easterly direction towards the Malanspruit.
- The existing production borehole on the farm was scientifically pumptested and it was calculated that a total volume of 1296 m³/month (15552 m³/annum) can be abstracted from the tested borehole.
- Water samples were collected from the existing production borehole, as well as selected boreholes identified during the hydrocensus. The water quality in all of the sampled boreholes can be classified as Class 1 and is fit for human consumption.
- Based on information collected during the hydrocensus it can be concluded that the aquifer system in the study area can be classified as a "Major Aquifer System". The local population and farms make use of groundwater as a source of potable water and borehole yields and water quality are generally good. One can also assume that the aquifer is important for supplying base flow to the local rivers and their tributaries. Consequently, high level groundwater protection may be required.
- The results of the Reserve Determination Study revealed that the local recharge on the property will allow for abstraction of ~ 287 820 m³/annum. There will be applied for an abstraction of 276 000 m³/annum from the total registered property. The recharge calculations (abstraction being 96% of the local recharge) places the application in Category B (medium scale abstraction – 60 to 100 % abstraction of the recharge on the registered property).
- It is important to note that the existing production borehole on the farm (MBH1) will not supply in the volume of water applied for in the Water Use Licence. A groundwater exploration program will have to be embarked upon to geophysically site, drill and pumptest additional boreholes.

Based on the above conclusions, the following recommendations are made:

- Uncontrolled and poor management practices of feedlots may pose a significant threat to water resource quality, particularly from nutrient-rich wastewater entering surface and

groundwater bodies. In order to mitigate potential contamination of the aquifers underlying the study area, a groundwater management program needs to be developed and implemented as part of the environmental management program.

- As part of the groundwater management program, a groundwater monitoring program should be implemented to monitor the impact of the proposed feedlot on the hydrogeological environment. Should it become evident from the monitoring program that pollution of the groundwater occurs, corrective and remedial actions should be implemented.

APPENDIX A

MAPS



Project Title:
**GEOHYDROLOGICAL
 INVESTIGATION AT
 MLEKI'S BEEF FEEDLOT**

Map Title:
**Mleki's Beef:
 Locality Map**

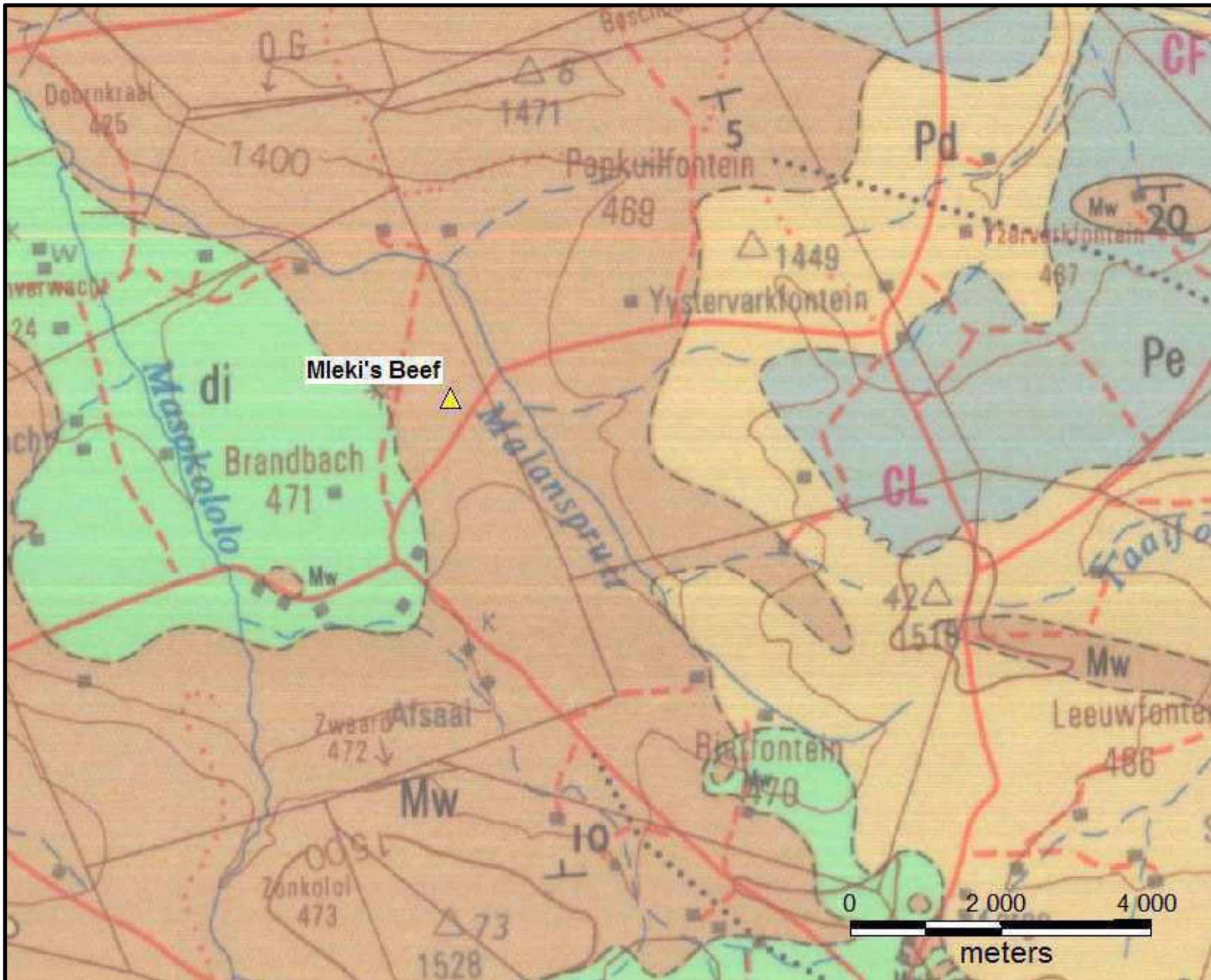
Map Number:
Map 1

LEGEND



Project nr: 109899/MLEKI

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 Lynnwood Bridge Office Park
 4 Daventry Street
 Lynnwood Manor 0040
 www.aurecongroup.com



Project Title:
GEOHYDROLOGICAL INVESTIGATION AT MLEKI'S BEEF FEEDLOT

Map Title:
Mleki's Beef: Geology Map

Map Number:
Map 2

LEGEND

- Pe:** Ecca (Sandstone, Shale, Coal)
- Pd:** Dwyka (Tillite, Shale)
- Mw:** Wilgerivier (Sandstone, Conglomerate)
- di:** Diabase



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Project Title:
**GEOHYDROLOGICAL
 INVESTIGATION AT
 MLEKI'S BEEF FEEDLOT**

Map Title:
**Mleki's Beef:
 Borehole Positions**

Map Number:
Map 3

LEGEND

-  Borehole
-  Mleki's Beef Property Boundary



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APPENDIX B

HYDROCENSUS DATA

BH nr.	Description	Coordinates (S & E) (decimal degrees) (WGS84)		Property Description	Owner/ Contact Person	Tel nr.	Date drilled	Depth (m)	Collar height (m)	Static waterlevel (mbcl)	Date measured	Equipment	Yield (l/h)	User application	Est. Usage (l/day)
MBBH1	Mleki Beef	25.61884	28.64058	Brandbach 471 Portion 47	Marli Burger	012 346 3810	Unknown	120	0	22.30	08/08/2013	Submersible Pump	3 000	Stock Watering	100 000
MBBH2	Communal BH	25.61878	28.65616	Papkuilfontein 469 Portion 1	Bongi Mbobane	0724704402	2006	18.1	0.42	6.00	13/08/2013	None	~	Not in use	~
MBBH3	Communal BH	25.61481	28.65632	Papkuilfontein 469 Portion 1	Ezekiel Mkabela	0797463830	Unknown	Unknown	0	BH Sealed	13/08/2013	Submersible Pump	3 000	Domestic	15 000
MBBH4	Vegetable Farm	25.60869	28.63528	Brandbach 471 Portion 14	Dick von Staden	0824990120	Unknown	35	0	BH Sealed	13/08/2013	Submersible Pump	4 000	Domestic	5 000
MBBH5	Vegetable Farm	25.60806	28.63565	Brandbach 471 Portion 14	Dick von Staden	0824990120	2011	300	0.18	1.25	13/08/2013	Submersible Pump	4 000	Not in use	~
MBBH6	Vegetable Farm	25.60891	28.63313	Brandbach 471 Portion 14	Dick von Staden	0824990120	Unknown	90	0.25	BH Sealed	13/08/2013	Submersible Pump	12 000	Domestic	5 000
MBBH7	Vegetable Farm	25.60830	28.63416	Brandbach 471 Portion 14	Dick von Staden	0824990120	Unknown	40	0.08	3.28	13/08/2013	None	300	Not in use	~
MBBH8	Vegetable Farm	25.60651	28.63287	Brandbach 471 Portion 13	Premier Farms Manuel	0725630033	2009	50	0.25	1.94	13/08/2013	Submersible Pump	81 000	Irrigation	50 000
MBBH9	Vegetable Farm	25.60646	28.63289	Brandbach 471 Portion 13	Premier Farms Manuel	0725630033	2010	50	0.6	BH Sealed	13/08/2013	Submersible Pump	16 000	Irrigation	100 000
MBBH10	Onverwacht Agri Project	25.60603	28.62066	Brandbach 471 Portion 12	Lytton Sadomba	0718696137	Unknown	20	0.1	5.0 (pumping)	13/08/2013	Submersible Pump	25 000	Irrigation/ Domestic	30 000
MBBH11	Onverwacht Agri Project	25.60609	28.62106	Brandbach 471 Portion 12	Lytton Sadomba	0718696137	Unknown	Unknown	0	BH Sealed	13/08/2013	Submersible Pump	2 000	Domestic	5 000
MBBH12	Onverwacht Agri Project	25.60657	28.62006	Brandbach 471 Portion 12	Lytton Sadomba	0718696137	Unknown	Rock Filled	~	~	13/08/2013	None	~	~	~
MBBH13	Game Farm	25.62781	28.65069	Brandbach 471 Portion 6	Unknown	~	Unknown	Unknown	0.25	6.05	13/08/2013	Windmill - Destroyed	500	Not in use	~
									AVERAGE	6.80		AVERAGE	13 709	TOTAL	310 000

APPENDIX C

CALCULATION OF SUSTAINABLE YIELD

FC-METHOD : Estimation of the sustainable yield of a borehole			
MBBH1			
Extrapolation time in years = (enter)	2	1051200	Extrapol.time in minutes
Effective borehole radius (r_e) = (enter)	47.74 ←	47.74 ←	Est. r_e ← From $r(e)$ sheet
Q (l/s) from pumping test =	1	2.87E-05 ←	S-late ← Change r_e
s_a (available drawdown), σ_s = (enter)	50.0		← σ_s from risk
Annual effective recharge (mm) =	10	52.00	$s_{available}$ working drawdown(m)
t(end) and s(end) of pumping test =	1440	30.71	End time and drawdown of test
Average maximum derivative = (enter)	24.7 ←	24.7	Estimate of average of max deriv
Average second derivative = (enter)	0.0 ←	0.0	Estimate of average second deriv
Derivative at radial flow period = (enter)	5.93 ←	5.93	Read from derivative graph
T and S estimates from derivatives (To obtain correct S-value, use program RPTSOLV)	T-early[m ² /d] =	2.67	Aqui. thick (m) = 20
	T-late [m ² /d] =	0.64	Est. S-late = 1.10E-03
	S-late =	5.00E-03	S-estimate could be wrong
BASIC SOLUTION			
(Using derivatives + subjective information about boundaries) (No values of T and S are necessary)		Maximum influence of boundaries at long time	
	No boundaries	1 no-flow	2 no-flow
sWell (Extrapol.time) =	101.39	171.98	242.58
Q_sust (l/s) =	0.51	0.30	0.21
	Best case →		← Worst case
Average Q_sust (l/s) =	0.25		
with standard deviation =	0.17		
(If no information exists about boundaries skip advanced solution and go to final recommendation)			
ADVANCED SOLUTION			
(Using derivatives+ knowledge on boundaries and other boreholes)			
(Late T-and S-values a priori + distance to boundary)			
T-late [m ² /d] = (enter) →	0.64		
S-late = (enter) →	5.00E-03		
1. BOUNDARY INFORMATION (choose a or b)	(Code =9999 = dummy value if not applicable)		
(a) Barrier (no-flow) boundaries →	Closed Square	Single Barrier	Intersect. 90°
Bound. distance a[meter] : (enter)	9999	9999	9999
Bound. distance b[meter] : (enter)			9999
$s_{Bound}(t = Extrapol.time)$ [m] =	#NUM!	#NUM!	#NUM!
(b) Fix head boundary + no-flow →	Closed Fix	Single Fix	90°Fix+no-flow
Bound. distance to fix head a[meter] : (enter)	9999	9999	9999
Bound. distance to no-flow b[meter] : (enter)			9999
$s_{Bound}(t = Extrapol.time)$ [m] =	#NUM!	#NUM!	#NUM!
2. INFLUENCE OF OTHER BOREHOLES →	Q (l/s)	r (m)	u_r
BH1			0.00E+00
BH2			0.00E+00
$s_{(influence\ of\ BH1,BH2)}$ =	0.00	0.00	6.09E-03
SOLUTION INCLUDING BOUNDS AND BH's			
Fix head + No-flow : Q_sust (l/s) =	9999.00	9999.00	9999.00
No-flow : Q_sust (l/s) =	9999.00	9999.00	9999.00
Enter selected Q for risk analysis = (enter) →		Sigma_s =	0.000
(Go to Risk sheet and perform risk analysis from which σ_s will be estimated : only for barrier boundaries)			
FINAL RECOMMENDED ABSTRACTION RATE			
Abstraction rate (l/s) for 24 hr/d = (enter)	0.50		
Total amount of water allowed to be abstracted per month (m ³) =	1296		
COMMENTS			
Q_sust with 68% safety =			
Q_sust with 95% safety =			

APPENDIX D

LABORATORY REPORTS

Aspirata Microbiological & Chemical Laboratory

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TEST REPORT

AMCL13/0900



Page 1 of 8

Report number: C13/0108/01

Report date: 2013-08-23



CLIENT DETAILS:

Client reference / Order number: 109899/Mleki Beef
Client name: Aurecon SA
Address:
Fax number: 086 606 0396
Telephone number: 082 857 9488
E-mail address: marius.terblanche@aurecongroup.com,
louis.stroebe@louis.stroebe@aurecongroup.com

Report date: 2013-08-23

Sampling date: 2013-08-13

Date samples received: 2013-08-15

SAMPLE DETAILS

Label information: MBBH1
Date sample was received: 2013-08-15
Condition of sample: Clear, colourless, non-viscous liquid, no visible precipitate
Commencement of analysis: 2013-08-15
Completion of analysis: 2013-08-23
Sample type: Water sample
Sample preparation: Allowed to reach room temperature (20 °C; measured)

Analytical Results

Analytical Method	Determinant		Units	Specification	Results
AMS-ACL-201	pH	pH	-	5.0-9.7 at 25 °C	7.54 at 20.2°C
AMS-ACL 201	Conductivity	EC	mS/m	≤170 at 25°C	13.45 at 25°C
AMS-ACL-207	Total Dissolved Solids	TDS	mg/L	≤ 1 200	86.08
AMS-ACL-201/1	Ammonium	NH4- N	mg/L	≤ 1.50	< 0.05
AMS-ACL-201/5	Fluoride	F-	mg/L	≤ 1.5	< 0.6
AMS-ACL-201/6	Nitrite	NO2- N	mg/L	≤ 0.90	< 0.05
AMS-ACL-201/10	Nitrate	NO3- N	mg/L	≤ 11.00	0.3671
AMS-ACL-201/9	Sulphate	SO4 2-	mg/L	≤ 250	< 10.00
AMS-ACL-203	Total Alkalinity	TA	mg/L CaCO3	-	62.13
AMS-ACL-201/2	Chloride	Cl	mg/L	≤ 300	0.71

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TEST REPORT AMCL13/0900



Report number: C13/0108/01

Report date: 2013-08-23



Analytical Results					
Analytical Method	Determinant		Units	Specification	Results
AMS-ACL-201-8	Orthophosphate	PO4	mg/L	Orthophosphate	0.05673
AMS-ACL-202	Calcium	Ca	mg/L	-	7.38
AMS-ACL-202	Magnesium	Mg	mg/L	-	4.39
AMS-ACL-202	Sodium	Na	mg/L	≤ 200	12.67
AMS-ACL-202	Potassium	K	mg/L	-	3.25
AMS-ACL-202	Aluminium	Al	ug/L	≤ 300	18.25
AMS-ACL-202	Iron	Fe	ug/L	≤ 300	5.26
AMS-ACL-202	Manganese	Mn	ug/L	≤ 100	1.38
Calculation	Total Hardness	TH	mg/L CaCO3	Total Hardness (Ca, Mg)	35.7

The results contained in this report relate only to the test samples received and analysed as recorded above. The content of this report is proprietary information of the abovementioned client and may not be disclosed without the consent of the abovementioned client. This report shall not be reproduced, except in full, without the written approval of Aspirata Microbiological and Chemical Laboratory.

* These tests are not SANAS accredited and are not included in the SANAS Schedule of Accreditation for this laboratory.

** Opinions and interpretations expressed in this report are outside the scope of SANAS accreditation.

Comment:

Approved signatory:

Elrisa Taljaard Laboratory Manager

 Name in full

 Designation

 Signature

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TEST REPORT

AMCL13/0900



Page 3 of 8

Report number: C13/0108/02

Report date: 2013-08-23



CLIENT DETAILS:

Client reference / Order number: 109899/Mleki Beef
Client name: Aurecon SA
Address:
Fax number: 086 606 0396
Telephone number: 082 857 9488
E-mail address: marius.terblanche@aurecongroup.com,
louis.stroebel@aurecongroup.com

Report date: 2013-08-23
Sampling date: 2013-08-13
Date samples received: 2013-08-15

SAMPLE DETAILS

Label information: MBBH3
Date sample was received: 2013-08-15
Condition of sample: Clear, colourless, non-viscous liquid, no visible precipitate
Commencement of analysis: 2013-08-15
Completion of analysis: 2013-08-23
Sample type: Water sample
Sample preparation: Allowed to reach room temperature (20 °C; measured)

Analytical Results

Analytical Method	Determinant		Units	Specification	Results
AMS-ACL-201	pH	pH	-	5.0-9.7 at 25 °C	8.82 at 20.0°C
AMS-ACL 201	Conductivity	EC	mS/m	≤170 at 25°C	26.53 at 25°C
AMS-ACL-207	Total Dissolved Solids	TDS	mg/L	≤ 1 200	169.79
AMS-ACL-201/1	Ammonium	NH4- N	mg/L	≤ 1.50	< 0.05
AMS-ACL-201/5	Fluoride	F-	mg/L	≤ 1.5	< 0.6
AMS-ACL-201/6	Nitrite	NO2- N	mg/L	≤ 0.90	< 0.05
AMS-ACL-201/10	Nitrate	NO3- N	mg/L	≤ 11.00	1.17
AMS-ACL-201/9	Sulphate	SO4 2-	mg/L	≤ 250	< 10.00
AMS-ACL-203	Total Alkalinity	TA	mg/L CaCO3	-	111.83
AMS-ACL-201/2	Chloride	Cl	mg/L	≤ 300	5.26

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TEST REPORT

AMCL13/0900



Report number: C13/0108/02

Report date: 2013-08-23



Analytical Results					
Analytical Method	Determinant		Units	Specification	Results
AMS-ACL-201-8	Orthophosphate	PO4	mg/L	Orthophosphate	< 0.05
AMS-ACL-202	Calcium	Ca	mg/L	-	6.41
AMS-ACL-202	Magnesium	Mg	mg/L	-	1.37
AMS-ACL-202	Sodium	Na	mg/L	≤ 200	49.87
AMS-ACL-202	Potassium	K	mg/L	-	1.67
AMS-ACL-202	Aluminium	Al	ug/L	≤ 300	142.41
AMS-ACL-202	Iron	Fe	ug/L	≤ 300	15.87
AMS-ACL-202	Manganese	Mn	ug/L	≤ 100	0.55
Calculation	Total Hardness	TH	mg/L CaCO3	Total Hardness (Ca, Mg)	20.99

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Comment:

Approved signatory:

	Elrisa Taljaard	Laboratory Manager	
	Name in full	Designation	Signature

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TEST REPORT

AMCL13/0900



Page 5 of 8

Report number: C13/0108/03

Report date: 2013-08-23



CLIENT DETAILS:

Client reference / Order number: 109899/Mleki Beef
Client name: Aurecon SA
Address:
Fax number: 086 606 0396
Telephone number: 082 857 9488
E-mail address: marius.terblanche@aurecongroup.com,
louis.stroebel@aurecongroup.com

Report date: 2013-08-23

Sampling date: 2013-08-13

Date samples received: 2013-08-15

SAMPLE DETAILS

Label information: MBBH6
Date sample was received: 2013-08-15
Condition of sample: Clear, colourless, non-viscous liquid, no visible precipitate
Commencement of analysis: 2013-08-15
Completion of analysis: 2013-08-23
Sample type: Water sample
Sample preparation: Allowed to reach room temperature (20 °C; measured)

Analytical Results

Analytical Method	Determinant		Units	Specification	Results
AMS-ACL-201	pH	pH	-	5.0-9.7 at 25 °C	7.97 at 20.1°C
AMS-ACL 201	Conductivity	EC	mS/m	≤170 at 25°C	19.89 at 25°C
AMS-ACL-207	Total Dissolved Solids	TDS	mg/L	≤ 1 200	127.3
AMS-ACL-201/1	Ammonium	NH4- N	mg/L	≤ 1.50	< 0.05
AMS-ACL-201/5	Fluoride	F-	mg/L	≤ 1.5	< 0.6
AMS-ACL-201/6	Nitrite	NO2- N	mg/L	≤ 0.90	< 0.05
AMS-ACL-201/10	Nitrate	NO3- N	mg/L	≤ 11.00	1.15
AMS-ACL-201/9	Sulphate	SO4 2-	mg/L	≤ 250	< 10.00
AMS-ACL-203	Total Alkalinity	TA	mg/L CaCO3	-	111.83
AMS-ACL-201/2	Chloride	Cl	mg/L	≤ 300	1.98

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TEST REPORT AMCL13/0900



Report number: C13/0108/03

Report date: 2013-08-23



Analytical Results					
Analytical Method	Determinant		Units	Specification	Results
AMS-ACL-201-8	Orthophosphate	PO4	mg/L	Orthophosphate	< 0.05
AMS-ACL-202	Calcium	Ca	mg/L	-	9.68
AMS-ACL-202	Magnesium	Mg	mg/L	-	3.15
AMS-ACL-202	Sodium	Na	mg/L	≤ 200	29.14
AMS-ACL-202	Potassium	K	mg/L	-	1.24
AMS-ACL-202	Aluminium	Al	ug/L	≤ 300	28.34
AMS-ACL-202	Iron	Fe	ug/L	≤ 300	< 0.372
AMS-ACL-202	Manganese	Mn	ug/L	≤ 100	< 0.070
Calculation	Total Hardness	TH	mg/L CaCO3	Total Hardness (Ca, Mg)	36.13

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Comment:

Approved signatory:

Elrisa Taljaard	Laboratory Manager	
-----	-----	-----
Name in full	Designation	Signature

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TEST REPORT

AMCL13/0900



Report number: C13/0108/04

Report date: 2013-08-23



CLIENT DETAILS:

Client reference / Order number: 109899/Mleki Beef
 Client name: Aurecon SA
 Address:
 Fax number: 086 606 0396
 Telephone number: 082 857 9488
 E-mail address: marius.terblanche@aurecongroup.com,
 louis.stroebel@aurecongroup.com

Report date: 2013-08-23
 Sampling date: 2013-08-13
 Date samples recieved: 2013-08-15

SAMPLE DETAILS

Label information: MBBH9
 Date sample was received: 2013-08-15
 Condition of sample: Clear, colourless, non-viscous liquid, no visible precipitate
 Commencement of analysis: 2013-08-15
 Completion of analysis: 2013-08-23
 Sample type: Water sample
 Sample preparation: Allowed to reach room temperature (20 °C; measured)

Analytical Results					
Analytical Method	Determinant		Units	Specification	Results
AMS-ACL-201	pH	pH	-	5.0-9.7 at 25 °C	8.74 at 20.3°C
AMS-ACL 201	Conductivity	EC	mS/m	≤170 at 25°C	25.06 at 25°C
AMS-ACL-207	Total Dissolved Solids	TDS	mg/L	≤ 1 200	160.38
AMS-ACL-201/1	Ammonium	NH4- N	mg/L	≤ 1.50	< 0.05
AMS-ACL-201/5	Fluoride	F-	mg/L	≤ 1.5	< 0.6
AMS-ACL-201/6	Nitrite	NO2- N	mg/L	≤ 0.90	< 0.05
AMS-ACL-201/10	Nitrate	NO3- N	mg/L	≤ 11.00	0.06255
AMS-ACL-201/9	Sulphate	SO4 2-	mg/L	≤ 250	11.51343
AMS-ACL-203	Total Alkalinity	TA	mg/L CaCO3	-	116.8
AMS-ACL-201/2	Chloride	Cl	mg/L	≤ 300	1.82

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TEST REPORT

AMCL13/0900



Page 8 of 8

Report number: C13/0108/04

Report date: 2013-08-23



Analytical Results					
Analytical Method	Determinant		Units	Specification	Results
AMS-ACL-201-8	Orthophosphate	PO4	mg/L	Orthophosphate	< 0.05
AMS-ACL-202	Calcium	Ca	mg/L	-	6.57
AMS-ACL-202	Magnesium	Mg	mg/L	-	1.1
AMS-ACL-202	Sodium	Na	mg/L	≤ 200	46.92
AMS-ACL-202	Potassium	K	mg/L	-	1.13
AMS-ACL-202	Aluminium	Al	ug/L	≤ 300	24.76
AMS-ACL-202	Iron	Fe	ug/L	≤ 300	< 0.372
AMS-ACL-202	Manganese	Mn	ug/L	≤ 100	11.71
Calculation	Total Hardness	TH	mg/L CaCO3	Total Hardness (Ca, Mg)	20.29

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Comment:

Approved signatory:

Elrisa Taljaard

Laboratory Manager

Name in full

Designation


Signature

APPENDIX E

PUMPTESTING FIELD SHEETS

TRANS AFRICA WATER SERVICES

BOREHOLE TEST CONTROL SHEET

Borehole Number:	MBBH1	Old/Alternative Number:	
Contractor:	Trans Africa	Supervisor:	Marais
Operator	Ruben	Rig Number:	No1

EXISTING EQUIPMENT

Type of Pump	Depth	Condition	Drive Unit	Condition	Pumphouse	Condition
Electric	100	Good	Brisan 2.2 kW	Good	No	~

TESTING EQUIPMENT

Pump type	Depth Installed	Date and Time (started)	Date and Time (Completed)
BP200	63	08/08/2013 14:00	08/08/2013 17:10

MULTI-RATE OR STEPTEST DETAILS

Step	Duration (min)	Recovery (min)	Yield (l/s)	Drawdown (m)
1	60.00		0.35	6.18
2	60.00		0.64	12.28
3	60.00		1.08	29.17
4	10.00		2.08	40.02
5				
Calibration				
TOTAL:	190.00	410.00		
COMMENT:				

CONSTANT RATE DISCHARGE TEST

Type of pump	Depth Installed	Date and Time (started)	Date and Time (Completed)
BP200	63	09/08/2013 08:00	11/08/2013 14:48
Yield (l/s)	Drawdown (m)	Duration (min)	Recovery (min)
1.02	30.71	1440	410
TOTAL (Multi-rate and Constant discharge rate)			
COMMENT:			

GENERAL

Establishment	From: Pretoria	To: Cullinan	Distance (km)
Site Move	From	To	Distance (km)
	Village Borehole #	Village Borehole #	
	Mleki BH01		
Maintenance	Work Time (hr)	Parts Re-place/repair	Travelling (km)
After Test Measurements	Water Level 22.3	Borehole Depth 120.00	Casing Depth
REMARKS:			
Signed for Contractor:		Signed for Consultant:	

BOREHOLE TEST RECORD SHEET

REQUEST NO:		MAP REFERENCE:		REGION:	Gauteng
BOREHOLE NO:	MBBH1	COORDINATES (Dec. Deg.)	Lo:	DISTRICT:	Cullinan
ALT. BH. NO:		LATITUDE:	25.61884	X:	
ALT. BH. NO:		LONGITUDE:	28.64058	Y:	
BOREHOLE DEPTH (m):	120.00	DATUM LEVEL ABOVE CASING (m):	0.68	EXISTING PUMP:	
WATER LEVEL (m):	22.30	CASING HEIGHT (magl):	0.00	CONTRACTOR:	
DEPTH OF PUMP (m):	63.00	BH DIAM. (PUMP INLET) (mm):	165.00	PUMP TYPE:	BP200

MULTI-RATE DISCHARGE TEST AND RECOVERY

DISCHARGE RATE 1					DISCHARGE RATE 2					DISCHARGE RATE 3				
DATE: 08/08/2013		TIME: 14:00			DATE: 08/08/2013		TIME: 15:00			DATE: 08/08/2013		TIME: 16:00		
TIME (min)	DRAWDOWN (m)	YIELD (l/s)	TIME (min)	RECOVERY (m)	TIME (min)	DRAWDOWN (m)	YIELD (l/s)	TIME (min)	RECOVERY (m)	TIME (min)	DRAWDOWN (m)	YIELD (l/s)	TIME (min)	RECOVERY (m)
1	1.17		1		1	6.44		1		1	12.74		1	
2	1.46		2		2	7.26		2		2	13.38		2	
3	1.70		3		3	7.95	0.67	3		3	14.22	1.06	3	
5	2.13		5		5	8.52	0.65	5		5	15.33		5	
7	3.00	0.35	7		7	8.98		7		7	16.94		7	
10	3.88		10		10	9.48		10		10	17.66	1.06	10	
15	4.37	0.34	15		15	10.30	0.65	15		15	19.14		15	
20	4.90		20		20	10.58		20		20	21.07		20	
30	5.31	0.35	30		30	11.02	0.65	30		30	23.50	1.06	30	
40	5.74		40		40	11.47		40		40	25.33		40	
50	6.00	0.35	50		50	11.82	0.64	50		50	27.38	1.08	50	
60	6.18		60		60	12.28		60		60	29.17		60	
70			70		70			70		70			70	
80			80		80			80		80			80	
90			90		90			90		90			90	
100			100		100			100		100			100	
110			110		110			110		110			110	
120			120		120			120		120			120	
150			150		150			150		150			150	
180			180		180			180		180			180	
240			240		240			240		240			240	
300			300		300			300		300			300	
410			410		410			410		410			410	
440			440		440			440		440			440	

DISCHARGE RATE 4					DISCHARGE RATE 5					YIELD (CALIBRATION) TEST				
DATE: 08/08/2013		TIME: 17:00			DATE:		TIME:			DATE:		TIME:		
TIME (min)	DRAWDOWN (m)	YIELD (l/s)	TIME (min)	RECOVERY (m)	TIME (min)	DRAWDOWN (m)	YIELD (l/s)	TIME (min)	RECOVERY (m)	TIME (min)	DRAWDOWN (m)	YIELD (l/s)	TIME (min)	RECOVERY (m)
1	31.88		1	35.70	1			1		1			1	
2	33.60		2	27.66	2			2		2			2	
3	35.27	2.08	3	20.06	3			3		3			3	
5	37.80		5	13.68	5			5		5			5	
7	39.06	2.08	7	8.70	7			7		7			7	
10	40.02		10	6.64	10			10		10			10	
15	PI	1.53	15	4.26	15			15		15			15	
20	PI	1.50	20	2.87	20			20		20			20	
30	PI	1.50	30	2.55	30			30		30			30	
40			40	2.26	40			40		40			40	
50			50	2.02	50			50		50			50	
60			60	1.76	60			60		60			60	
70			70	1.54	70			70		70			70	
80			80	1.33	80			80		80			80	
90			90	1.25	90			90		90			90	
100			100	1.12	100			100		100			100	
110			110	0.81	110			110		110			110	
120			120	0.63	120			120		120			120	
150			150	0.44	150			150		150			150	
180			180	0.32	180			180		180			180	
240			240	0.24	240			240		240			240	
300			300	0.13	300			300		300			300	
410			410	0.00	410			410		410			410	
440			440		440			440		440			440	

COMMENTS: 1)

BOREHOLE TEST RECORD SHEET

REQUEST NO:		MAP REFERENCE:		REGION: Gauteng	
BOREHOLE NO: MBBH1		COORDINATES (Dec. Deg.)		DISTRICT: Cullinan	
ALT. BH. NO:		LATITUDE: 25.61884 X:		FARM NAME:	
ALT. BH. NO:		LONGITUDE: 28.64058 Y:		VILLAGE: 0	
BOREHOLE DEPTH (m): 120.00		DATUM LEVEL ABOVE CASING (m): 0.68		EXISTING PUMP	
WATER LEVEL (mbgl): 22.30		CASING HEIGHT (magl): 0.00		NONE	
DEPTH OF PUMP (m): 63.00		BH DIAM. (PUMP INLET) (mm): 165.00		Contract dgm	
CONSTANT RATE DISCHARGE TEST AND RECOVERY					
TEST STARTED		TEST COMPLETED		DURATION (min): 1440	
DATE: 09/08/2013		TIME: 08:00		DATE: 11/08/2013	
		TIME: 14:48		TYPE OP PUMP: BP200	
"NOTE" Distance between discharge and observation holes in m.					
		OBSERV. HOLE 1		OBSERV. HOLE 2	
		Nr:		Nr:	
		Distance:		Distance:	
		Distance:		Distance:	
DISCHARGE BOREHOLE					
TIME	DRAWDOWN	YIELD	TIME	RECOVERY	TIME
(min)	s' (m)	(l/s)	(min)	s' (m)	(min)
					DRAWDOWN
					(m)
1	1.26		1	26.12	1
2	2.17		2	22.55	2
3	2.91		3	19.16	3
5	3.45	0.84	5	15.44	5
7	4.06	0.97	7	13.00	7
10	4.84	1.15	10	9.88	10
15	5.23		15	7.55	15
20	5.78	1.09	20	6.70	20
30	6.33	1.02	30	5.41	30
40	7.62		40	4.66	40
60	9.37	1.01	60	4.20	60
90	10.72		90	3.55	90
120	11.44	1.03	120	3.17	120
150	12.00		150	2.72	150
180	13.17	1.01	180	2.48	180
210	14.03		210	2.41	210
240	15.50	0.99	240	2.35	240
300	17.13	1.03	300	2.29	300
360	19.64		360	2.24	360
420	21.67	1.02	420	2.18	420
480	22.30		480	2.14	480
540	23.52		540	2.10	540
600	24.14	1.01	600	2.05	600
720	25.06		720	1.98	720
840	25.95	0.98	840	1.92	840
960	26.47	1.03	960	1.88	960
1080	27.33		1080	1.83	1080
1200	28.62	1.02	1200	1.79	1200
1320	29.22	1.01	1320	1.75	1320
1440	30.71	1.02	1440	1.71	1440
1800			1800		1800
2280			2280		2280
2880			2880		2880
3480			3480		3480
3900			3900		3900
4320			4320		4320
4920			4920		4920
5760			5760		5760
TOTAL TIME PUMPED (r		1440		NOTE: t" = total time since pumping started	
AVERAGE YIELD (l/s):		1.01		t" = time since pumping started	
COMMENTS: 1).					

Environmental Management Plan (EMP)



Appendix H

February
2014

Final Environmental Management Plan (EMP) for the Proposed Cattle Feedlot, Cullinan

REF No GAUT: 002/12-13/E0222



BOKAMOSO
LANDSCAPE ARCHITECTS &
ENVIRONMENTALCONSULTANTS CC
P.O. BOX 11375
MAROELANA
0161
TEL: (012) 346 3810
Fax: 086 570 5659
Email: Lizelleg@mweb.co.za



1 PROJECT OUTLINE

1.1 Background

Bokamoso Landscape Architects & Environmental Consultants was appointed by **Mlekis Beef** to compile a Basic Assessment Report for the proposed cattle feedlot near Cullinan. The study area for the proposed cattle feedlot forms part of the larger study area (533 hectares) of the farm Brandbach.

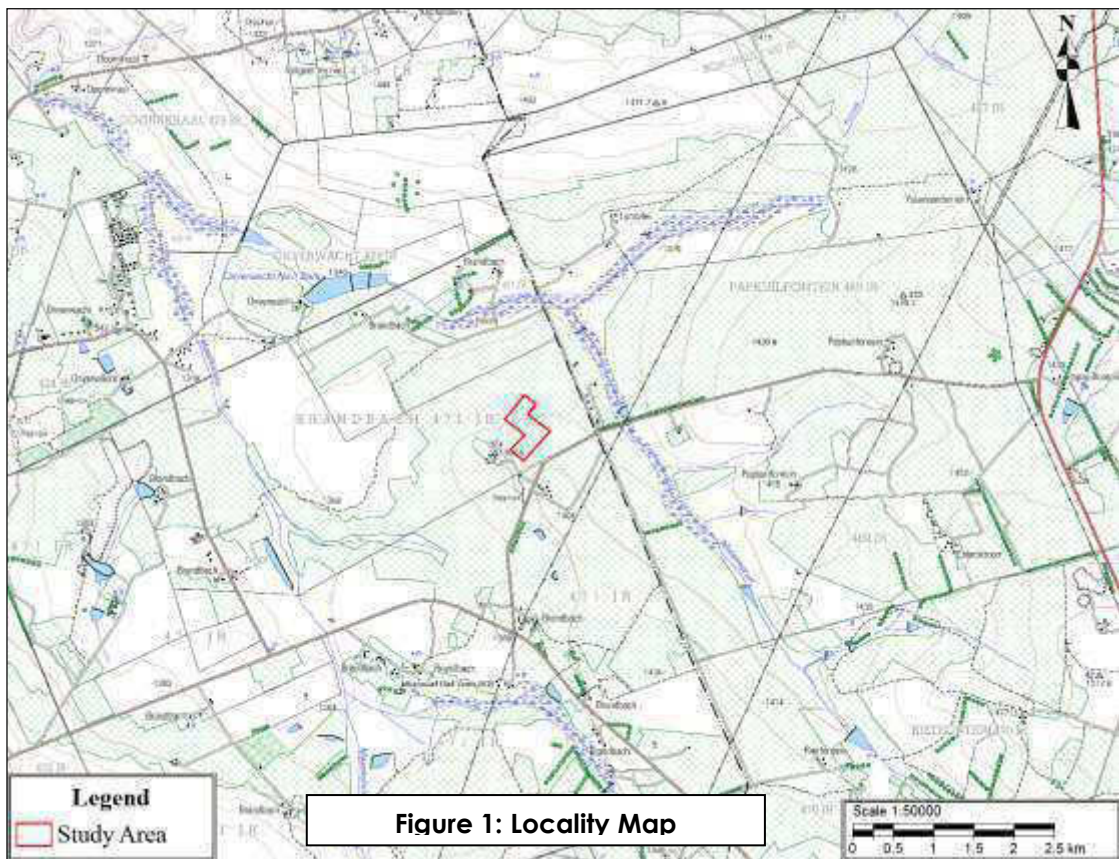
1.2 Project Description

The Proposed Development will be known as **Mlekis Cattle Feedlot** and will be established as an open-air feedlot and as a result the animals will be exposed to weather and climate conditions, including rain, heat and cold. The proposed cattle feedlot is situated on a Part of Portion 47 of the farm Brandbach 471 JR, Cullinan, Gauteng Province.

The Total extent of the proposed application site(s) is approximately 19.9 hectares and is located in the area of jurisdiction of the **City of Tshwane Metropolitan Municipality** in Gauteng Province.

(Refer to Figure 1 for the Locality Map and Figure 2 for the Aerial Map)

February 2014



Timeframe for construction:

Construction will commence as soon as the project is approved. The **proposed cattle feedlot** will be responsible for the on-site activities. The EMP will be a binding document for purposes of compliance.

1.3 Receiving Environment

Hydrology:

- No river or wetlands occur on the development area. The study area is not affected by any floodlines;

Fauna and Flora:

- According to the GDARD C-Plan the study area does not fall within an irreplaceable site;
- Eight Red data plant species are known to occur in the 2528DA quarter degree grid cell. According to the GDARD C-Plan only one Orange Listed plant possibly occur in the surrounding areas, more than 600m away from the site. No red data plant species were observed during the flora assessment;
- The study area does not fall on a ridge or in a buffer zone of any ridge; and
- It is unlikely that there are any threatened animal species or any other animal species of particular conservation concern distinctly using the site as a habitat. It is therefore concluded that there would be no threat to any threatened species or any other species of particular conservation concern at the site for the proposed footprint.

Cultural /Historical:

- No obvious features, sites or artefacts of cultural significance were found on the site.

Visual:

- The study area is visible from the R875, a short (± 8.5 km) farm road connecting two gravel roads.

Geology:

- The site is underlain by the Waterberg Formation, Soutpansberg Group of the Oranje River Supergroup. No dolomite has been identified on the proposed study area. The soils on site have limiting soil depth with low clay content and impeded internal drainage.

2 EMP OBJECTIVES AND CONTEXT

Objectives

The objectives of this plan are to:

- Identify the possible environmental impacts of the proposed activity;
- Develop measures to minimise, mitigate and manage these impacts;
- Meet the requirements of the Record of Decision of GDARD and requirements of other Authorities; and
- Monitor the project.

EMP context

This EMP fits into the overall planning process of the project by carrying out the conditions of consent set out by the Gauteng Department of Agriculture and Rural Development. In addition, all mitigation measures recommended in the Basic Assessment report are included in the EMP.

This EMP addresses the following three phases of the development:

- Pre-construction planning phase;
- Construction phase; and
- Operational phase.

3 MONITORING

In order for the EMP to be successfully implemented all the role players involved must have a clear understanding of their roles and responsibilities in the project.

These role players may include the Authorities (A), other Authorities (OA), Developer/proponent (D), Environmental Control Officer (ECO), Project Manager (PM), Contractors (C), Environmental Assessment Practitioner (EAP) and Environmental Site Officer (ESO). Landowners interested and affected parties and the relevant environmental and project specialist's area also important role players.

3.1 Roles and responsibilities

Developer (D)

The developer is ultimately accountable for ensuring compliance with the EMP and conditions contained in the RoD. The developer must appoint an independent Environmental Control Officer (ECO), for the duration of the pre-construction and construction phases, to ensure compliance with the requirements of this EMP. The developer must ensure that the ECO is integrated as part of the project team.

Project Manager (PM)

The project Manager is responsible for the coordination of various activities and ensures compliance with this EMP through delegation of the EMP to the contractors and monitoring of performance as per the Environmental Control Officer's monthly reports.

February 2014

Environmental Control Officer (ECO)

An independent Environmental Control Officer (ECO) shall be appointed, for the duration of the pre-construction and construction phase of the services and bulk infrastructure, by the developer to ensure compliance with the requirements of this EMP. Thereafter the individual property owners will be responsible for the further appointment of the ECO.

- The Environmental Control Officer shall ensure that the contractor is aware of all the specifications pertaining to the project;
- Any damage to the environment must be repaired as soon as possible after consultation between the Environmental Control Officer, Consulting Engineer and Contractor;
- The Environmental Control Officer shall ensure that the developer staff and/or contractor are adhering to all stipulations of the EMP;
- The Environmental Control Officer shall be responsible for monitoring the EMP throughout the project by means of site visits and meetings. This should be documented as part of the site meeting minutes;
- The Environmental Control Officer shall be responsible for the environmental training program;
- The Environmental Control Officer shall ensure that all clean up and rehabilitation or any remedial action required, are completed prior to transfer of properties;
- A post construction environmental audit is to be conducted to ensure that all conditions in the EMP have been adhered to.

Contractor (C):

The contractors shall be responsible for ensuring that all activities on site are undertaken in accordance with the environmental provisions detailed in this document and that sub-contractor and labourers are duly informed of their roles and responsibilities in this regard.

February 2014

The contractor will be required, where specified to provide Method Statements setting out in detail how the management actions contained in the EMP will be implemented.

The contractors will be responsible for the cost of rehabilitation of any environmental damage that may result from non-compliance with the environmental regulations.

Environmental Site Officer (ESO):

The ESO is not an independent appointment but must be a member of the contractor's management team. The ESO must ensure that he/she is involved at all phases of the construction (from site clearance to rehabilitation).

Authority (A):

The authority is the relevant environmental department that has issued the Environmental Authorisation. The authority is responsible for ensuring that the monitoring of the EMP and other authorization documentation is carried out by means of reviewing audit reports submitted by the ECO and conducting regular site visits.

Other Authorities (OA):

Other authorities are those that may be involved in the approval process of the EMP.

Environmental Assessment Practitioner (EAP):

According to Section 1 of NEMA the definition of an environmental assessment practitioner is "the individual responsible for the planning, management and coordination of environmental impact assessments, strategic environmental assessments, environmental management plans or any other appropriate environmental instruments through regulations".

3.2 Lines of Communication:

The Environmental Control Officer in writing should immediately report any breach of the EMP to the Project Manager. The Project Manager should then be responsible for rectifying the problem on-site after discussion with the contractor. Should this require additional cost, then the developer should be notified immediately before any additional steps are taken.

3.3 Reporting Procedures to the Developer:

Any pollution incidents must be reported to the Environmental Control Officer immediately (within 12 hours). The Environmental Control Officer shall report to the Developer on a regular basis (site meetings).

3.4 Site Instruction Entries:

The site instruction book entries will be used for the recording of general site instructions as they relate to the works on site. There should be issuing of stop work order for the purposes of immediately halting any activities of the contractor that may pose environmental risk.

3.5 ESA/ESO (Environmental Site Officer) Diary Entries:

Each of these books must be available in duplicate, with copies for the Engineer and Environmental Site Officer. These books should be available to the authorities for inspection or on request. All spills are to be recorded in the ESA/Environmental Site Officer's diary.

3.6 Methods Statements:

Methods statements from the contractor will be required for specific sensitive actions on request of the authorities or ESA/ESO (Environmental Site Officer). All method statements will form part of the EMP documentation and are subject to all terms and

conditions contained within the EMP document. For each instance wherein it is requested that the contractor submit a method statement to the satisfaction of ESA/ESO, the format should clearly indicate the following:

- What – a brief description of the work to be undertaken
- How- a detailed description of the process of work, methods and materials
- Where- a description / sketch map of the locality of work; and
- When- the sequencing of actions with due commencement dates and completion date estimate.

The contractor must submit the method statement before any particular construction activity is due to start. Work may not commence until the method statement has been approved by the ESA/ESO.

3.7 Record Keeping:

All records related to the implementation of this management plan (e.g. site instruction book, ESA/ESO dairy, methods statements etc.) must be kept together in an office where it is safe and can be retrieved easily. These records should be kept for two years at any time be available for scrutiny by any relevant authorities.

3.8 Acts:

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

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

- ❑ Meeting the basic human needs of present and future generations;
- ❑ Promoting equitable access to water;
- ❑ Promoting the efficient, sustainable and beneficial use of water in the public interest;
- ❑ Reducing and preventing pollution and degradation of water resources;

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- ❑ Facilitating social and economic development; and
- ❑ Providing for the growing demand for water use.

Impact on proposed Development:

Significant- The proposed development is not subjected to flood lines of any natural stream or water course within an expected frequency of 1:50 and 1:100 years and therefore in terms of Section 21 of the National Water Act no water use licenses, for activity (c) and (i), are required for the development itself. However, the larger study area does contain a natural stream running through the property at the southern corner and some operational activities may require authorisation in terms of Section 21 of the National Water Act.

3.8.2 National Environmental Management: Air Quality Act, 2004 (Act 39 of 2004)

The NEMA: AQA serves to repeal the Atmospheric Pollution Prevention Act (45 of 1965) and various other laws dealing with air pollution and it provides a more comprehensive framework within which the critical question of air quality can be addressed.

The purpose of the Act is to set norms and standards that relate to:

- ❑ Institutional frameworks, roles and responsibilities
- ❑ Air quality management planning
- ❑ Air quality monitoring and information management
- ❑ Air quality management measures
- ❑ General compliance and enforcement.

Amongst other things, it is intended that the setting of norms and standards will achieve the following:

- The protection, restoration and enhancement of air quality in South Africa
- Increased public participation in the protection of air quality and improved public access to relevant and meaningful information about air quality
- The reduction of risks to human health and the prevention of the degradation of air quality.

The Act describes various regulatory tools that should be developed to ensure the implementation and enforcement of air quality management plans. These include:

- Priority Areas, which are air pollution 'hot spots'
- Listed Activities, which are 'problem' processes that require an Atmospheric Emission Licence
- Controlled Emitters, which includes the setting of emission standards for 'classes' of emitters, such as motor vehicles, incinerators, etc.
- Control of Noise
- Control of Odours.

Impact on proposed Development:

Significant – During the construction phase, dust and the generation of noise can become a significant factor, especially to the surrounding landowners. However if the development is well planned and the mitigating measures are successfully implemented the proposed development's contribution to air pollution and the generation of air pollution can become less significant. During the operational phase of the feedlot methane and CO₂ will be emitted into the atmosphere, however, this is not controlled by legislation in South Africa.

3.8.3 National Environmental Management Act (Act 107 of 1998)

The NEMA is primarily an enabling Act in that it provides for the development of environmental implementation plans and environmental management plans. The principles listed in the act serve as a general framework within which environmental management and implementation plans must be formulated.

The principles in essence state that environmental management must place people and their needs at the forefront of its concern and that development must be socially, environmentally and economically sustainable.

Impact on proposed Development:

Significant – Section 28 (1) of NEMA stated that every person who causes, has caused or may cause significant pollution or degradation of the environment must

take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm to the environment is authorised by law or cannot reasonably be avoided or stopped, to minimise and rectify such pollution or degradation of the environment.

The EMP is compiled in terms of Section 28 of NEMA.

3.8.4 National Environmental Management: Waste Act (Act 59 of 2008)

This Act came into effect on 11 June 2009. It aims to consolidate waste management in South Africa, and contains a number of commendable provisions, including:

- The establishment of a national waste management strategy, and national and provincial norms and standards for, amongst others, the classification of waste, waste service delivery, and tariffs for such waste services;
- Addressing reduction, reuse, recycling and recovery of waste;
- The requirement for industry and local government to prepare integrated waste management plans;
- The establishment of control over contaminated land;
- Identifying waste management activities that requires a licence, which currently include facilities for the storage, transfer, recycling, recovery, treatment and disposal of waste on land;
- Co-operative governance in issuing licenses for waste management facilities, by means of which a licensing authority can issue an integrated or consolidated license jointly with other organs of state that has legislative control over the activity; and
- The establishment of a national waste information system.

On 3 July 2009 the Minister of Environmental Affairs and Tourism promulgated a list of waste management activities that might have a detrimental effect on the environment. These listed activities provide the activities that require a Waste Management License. Two Categories is specified: Category A and Category B. As part of Category A Waste Management License application a Basic Assessment in

terms of Section 24(5) of the National Environmental Management Act (Act 107 of 1998) must be submitted to the relevant Authority. As part of a Category B Waste Management License a Scoping and EIA process in terms of Section 24(5) of the National Environmental Management Act (Act 107 of 1998) must be followed and submitted to the relevant Authority.

Impact on proposed Development:

Not significant- A waste management license will not be required during the operational phases of the proposed Cattle feedlot as animal waste material (manure) will be generated as a by-product and by-products are not considered to be waste.

3.8.5 National Veld and Forest Fire Act, 1998 (Act No. 101, 1998)

The purpose of this Act is to prevent and combat veld, forest and mountain fires throughout the Republic. Furthermore the Act provides for a variety of institutions, methods and practices for achieving the prevention of fires.

Impact on proposed Development:

Significant – Fires of construction workers may only be lit in the designated site camp as indicated in assistance with the ECO. It is important that a site development camp be located on a part of the application site that is already disturbed.

3.8.6 National Heritage Resources Act, 1999 (Act No. 25 of 1999)

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

Impact on proposed Development:

Not significant- No cultural/historical significant areas were identified within the application site and thus no areas of historical or cultural value will be affected.

3.8.7 Conservation of Agricultural Resources Act (Act No. 43 of 1983)

This Act provides for control over the utilization of the natural agricultural resources of the Republic in order to promote the conservation of the soil, the water sources and the vegetation and the combating of weeds and invader plants; and for matters connected therewith.

Impact on proposed Development:

Not Significant – According to the Gauteng Agricultural Potential Atlas (GAPA 3), the proposed Cattle Feedlot Development is located on a moderate to high potential for Agricultural Land. The proposed development will be in line with the surrounding land-uses and as it is an agricultural development it fits in with Agricultural Hub and associated activities.

3.8.8 Water Services Act, 1997 (Act No. 108 of 1997)

This Act provides for the minimum standards and measures of which the following Water Services should adhere to:

- Basic sanitation
- Basic water supply
- Interruption in provision of water services
- Quality of potable water
- Control of objectionable substances
- Disposal of grey water
- Use of effluent
- Quantity and quality of industrial effluent discharged into a sewerage system
- Water services audit as a component in the Water Services Development Plan
- Water and effluent balance analysis and determination of water losses
- Repair of leaks

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- Consumer installations other than meters
- Pressure in reticulation system

Impact on proposed Development:

Significant – The application will adhere to the water services act.

3.8.9 National Environmental Management Act: Biodiversity Act (Act No. 10 of 2004)

The purpose of the Biodiversity Act is to provide for the management 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 the implementation strategy, the National Spatial Biodiversity Assessment was developed.

Impact on proposed Development:

Not Significant – According to the GDARD C-Plan the study area does not fall within an irreplaceable site. No red data plant species were found on site during the flora assessment as well as no red data fauna species during the Ecological Fauna Habitat survey. No wetland were found on site.

3.8.10. National Spatial Biodiversity assessment

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

Impact on proposed Development:

Not Significant – No irreplaceable sites exist on the land development area.

3.8.11 Protected Species – Provincial Ordinances

Provincial ordinances were developed to protect particular plant species within specific provinces. The protection of these species is enforced through permitting

requirements associated with provincial lists of protected species. Permits are administered by the Provincial Departments of Environmental Affairs.

Impact on proposed Development:

Not Significant- No provincially protected species were identified on the study site.

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

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

Impact on proposed Development:

Not Significant – The study area is not situated in a Protected Area identified in terms of the Protected Areas Act.

3.8.13 National Road Traffic Act, 1996 (Act No. 93 of 1996)

This Act provides for all road traffic matters which shall apply uniformly throughout the Republic and for matters connected therewith.

Impact on proposed Development:

Not significant - Not applicable.

3.8.14 Environmental Conservation Act: Noise Regulations, 1989 (Act no.73 of 1989)

The purpose of this Act is to provide measures and management relating Noise levels. This Act enables Noise levels to be acceptable to standards within a specific area and community.

Impact on proposed Development:

Significant – The proposed development may include some noisy activities during the construction phase.

4 PROJECT ACTIVITIES

4.1 Pre-Construction Phase

Aspect	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
General	Project contract	To make the EMPr enforceable under the general conditions of the contract.	The EMPr document must be included as part of all tender documentation.	The EMPr is included as part of the tender documentation	Applicant	During planning and design
Planning and design	Geology and Soils - Contamination and/or pollution of top and sub-soils; Land contamination	To minimise and/or prevent the contamination of top and sub-soils due to the operation of the proposed Cattle Feedlot.	A proper storm water management system should be designed for implementation during construction to manage all surface water flows in a sustainable manner. Provision should in addition be made for an oil-water separator to remove all hydrocarbons, greases etc. as a result of waste items that may be contaminated, prior to be discharged into the municipal storm water system; and Proper provision should be made for a designated area on site for the duration of the operational phase for the storage of hazardous and/or flammable items, including oils, greases, fuel etc. The said	Storm water management system design by a relevant professional, and ready for implementation during construction. Provision made for a designated area for the storage of hazardous and/or flammable substances.	Applicant Civil Engineer	During planning and design

Aspect	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
	Erosion and Siltation	To prevent the unnecessary loss of soil through bad management	<p>area should be lined with some form of secondary containment and bunded to contain at least 110% of the spilled substance.</p> <p>All surface run-offs should be managed in such a way so as to ensure erosion of soil does not occur. Provisions should be made for the development of a rehabilitation plan, prior to construction, to ensure that all the areas which are susceptible to erosion shall be covered with a suitable vegetative cover as soon as construction is completed.</p>			
	Surface Hydrology – Surface water pollution Contamination of storm water generated on site.	To prevent and minimise the risk for surface water pollution, as a result of storm water contamination.	<p>A detailed storm water management plan must be approved by the Local Authority prior to commencement of construction activities. Provision should be made for an oil-water separator to remove all hydrocarbons, greases etc, prior to discharge in the existing storm water management system. The storm water management systems should be implemented according to guidelines provided by the relevant Local Authority Departments;</p> <p>The storm water system for the proposed</p>	<p>Compilation and approval of storm water management plan.</p> <p>Provision made for a designated area for the storage of hazardous and/or flammable substances.</p>	Engineer Individual Applicant	During Planning and Design

Aspect	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
			<p>Cattle Feedlot must be designed to:</p> <ul style="list-style-type: none"> o Reduce and/ or prevent siltation, erosion and water pollution; o Storm water runoff should not be concentrated as far as possible and sheet flow should be implemented; o Provide for the removal of hydrocarbons, greases via an oil/water separator. <p>Provision should be made for energy dissipaters where necessary to reduce the velocity of storm water flows on site;</p> <p>Surface storm water generated as a result of the development must not be channeled directly into any natural drainage system or wetland;</p> <p>The storm water management plan should be designed in a way that aims to ensure that post development runoff does not exceed predevelopment values in:</p> <ul style="list-style-type: none"> o Peak discharge for any given storm; o Total volume of runoff for any given storm; 			

Aspect	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
			<ul style="list-style-type: none"> ○ Frequency of runoff; and ○ Pollutant and debris concentrations reaching water courses. <p>The storm water drainage network must be kept separate from the sewage effluent system;</p> <p>The municipality must be contacted with regard to any discharges either to storm water drainage system or to the municipal sewage sewer system;</p> <p>A spill Contingency or Emergency Response Plan must be drawn up and should include the actions that need to be taken in account in the event of spillages of chemicals, fuels etc, during the construction and operational phase of the proposed activity; and</p> <p>Proper provision should be made for a designated area on site for the duration of the operational phase for the storage of hazardous and/or flammable items, including oils, greases, fuel etc. The said area should be lined with some form of secondary containment and banded to</p>			

Aspect	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
			contain at least 110% of the spilled substance.			
	<p>Sub-surface Hydrology -</p> <p>Sub-surface water pollution, as a result of contaminated storm water.</p>	To prevent and minimise the risk for sub-surface water pollution, as a result of storm water contamination.	<p>A proper storm water management system should be designed for implementation during construction to manage all surface water flows in a sustainable manner. Provision should in addition be made for an oil-water separator to remove all hydrocarbons, greases etc. as a result of waste items that may be contaminated, prior to be discharged into a storm water system; and</p> <p>Proper provision should be made for a designated area on site for the duration of the operational phase for the storage of hazardous and/or flammable items, including oils, greases, fuel etc. The said area should be lined with some form of secondary containment and bunded to contain at least 110% of the spilled substance.</p>	<p>Storm water management system design by a relevant professional, and ready for implementation during construction.</p> <p>Provision made for a designated area for the storage of hazardous and/or flammable substances.</p>	Applicant Civil Engineer	During planning and design phase
	Waste storage	To control the temporary storage of waste.	Temporary waste storage points on site shall be determined. These storage points shall be accessible by waste removal trucks and these points should not be located in sensitive areas/areas highly visible from the properties of the		Applicant	

Aspect	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
			surrounding land-owners in areas where the wind direction will carry bad odours across the properties of adjacent landowners.			
	<p>Ambient Air Quality - Emissions to air generated and discharged by the manure.</p>	<p>To ensure that the emissions to air generated by cattle feedlot, and manure associated with it, does not pose an adverse effect on the ambient air quality of the surrounding area.</p>	<p>The proposed development of a cattle feedlot should be planned and layout plans should be drawn to incorporate the following:</p> <p>The proposed cattle feedlot will be situated 400 meters away from the nearest neighbour residence;</p> <p>The odour need to be managed by regularly removing manure from the feedlot to the temporary storage facility;</p> <p>Due to trampling by the cattle, the feedlot will generate dust and this can be mitigated by spraying little water on dry areas; and</p> <p>Material covers can be used to cover the manure storage areas.</p>		Applicant	During Planning and Design phase

4.2 Construction Phase

Aspect	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
General	Surrounding Residents	Service Interruption.	Contractor should inform all residents, landowners and tenants at least 48hours before the proposed interruption.		Applicant Contractor	
Contractors Camp	Vegetation and topsoil	To minimize damage to and loss of vegetation and retain quality of Topsoil.	<p>-Site to be established under supervision of ECO;</p> <p>- Clearing and relocation of plants to be undertaken in accordance with site specific requirements;</p> <p>-The Clearing of the Site should take place within phases to prevent large areas exposed which could be prone to erosion;</p> <p>-The Contractor's Camp should not be established in areas which are deemed to be sensitive. Areas with low Sensitivity such as degraded areas should rather be considered for the establishment of the contractor's Site Camp;</p> <p>-Valuable Topsoil that is cleared should be retained in designated stockpiles and used again during rehabilitation works.</p>	Minimal vegetation removed/ damaged during site activities.	Contractor	As and when required
	Surface and	To minimize	1) Sufficient and temporary facilities	Effluents	Contractor	As and when

Aspect	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
	<p>ground water pollution</p>	<p>pollution of surface and groundwater resources.</p>	<p>including ablution facilities must be provided for construction workers operating on the site;</p> <p>2) A minimum of one chemical toilet shall be provided per 10 persons. The contractor shall keep the toilets in a clean, neat and hygienic condition. Toilets provided by the contractor must be easily accessible and a maximum of 50m from the works area to ensure they are utilized. The contractor (who must use reputable toilet-servicing company) shall be responsible for the cleaning, maintenance and servicing of the toilets. The contractor (using reputable toilet-servicing company) shall ensure that all toilets are cleaned and emptied before the builders' or other public holidays;</p> <p>3) No person is allowed to use any other area than chemical toilets;</p> <p>4) No French drain systems may be installed;</p> <p>5) No chemical or waste water must be allowed to contaminate the run-off on site;</p>	<p>managed Effectively.</p> <p>No pollution of water resources from site.</p> <p>Workforce use toilets provided.</p>		<p>required</p>

Aspect	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
			6) Avoid the clearing of the site camp (of specific phase) or paved surfaces with soap.			
		To minimize pollution of surface and groundwater resources due to spilling of materials.	1) Drip trays and/ or lined earth bunds must be provided under vehicles and equipment, to contain spills of hazardous materials such as fuel, oil and cement; 2) Repair and storage of vehicles only within the demarcated site area; 3) Spill kits must be available on site; 4) Oils and chemicals must be confined to specific secured areas within the site camp. These areas must be bunded with adequate containment (at least 1.5 times the volume of the fuel) for potential spills or leaks; 5) All spilled hazardous substances must be contained in impermeable containers for removal to a licensed hazardous waste site; 6) No leaking vehicle shall be allowed on site. The mechanic/ the mechanic of the appointed contractor must supply the	No pollution of the environment	Contractor	Daily

Aspect	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
			<p>environmental officer with a letter of confirmation that the vehicles and equipment are leak proof;</p> <p>7) No bins containing organic solvents such as paints and thinners shall be cleaned on site, unless containers for liquid waste disposal are placed for this purpose on site.</p>			
		To minimize pollution of surface and groundwater resources by cement	The mixing of concrete shall only be done at specifically selected sites, as close as possible to the entrance, on mortar boards or similar structures to prevent run-off into drainage lines, streams and natural vegetation.	No evidence of contaminated soil on the construction site.	Contractor	Daily
		To minimize pollution of surface and groundwater resources due to effluent.	No effluent (including effluent from any storage areas) may be discharged into any water, surface or ground water resource.	No evidence of contaminated water resources.	Contractor	Daily
	Pollution of the environment	To prevent unhygienic usage on the site and pollution of the natural assets.	<p>1) Weather proof waste bins must be provided and emptied regularly;</p> <p>2) The contractor shall provide labourers to clean up the contractor's camp and construction site on a daily basis;</p>	<p>No waste bins overflowing</p> <p>No litter or building waste lying in or around the site</p>	Contractor	Daily Weekly

Aspect	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
			<p>3) Temporary waste storage points on the site should be determined. THESE AREAS SHALL BE PREDETERMINED AND LOCATED IN AREAS THAT IS ALREADY DISTURBED. These storage points should be accessible by waste removal trucks and these points should be located in already disturbed areas /areas not highly visible from the properties of the surrounding land-owners/ in areas where the wind direction will not carry bad odours across the properties of adjacent landowners. This site should comply with the following:</p> <ul style="list-style-type: none"> • Skips for the containment and disposal of waste that could cause soil and water pollution, i.e. paint, lubricants, etc.; • Small lightweight waste items should be contained in skips with lids to prevent wind littering; • Bunded areas for containment and holding of dry building waste. <p>4) No solid waste may be disposed of on the site;</p> <p>5) No waste materials shall at any stage be disposed of in the open veld of adjacent</p>			

Aspect	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
			<p>properties;</p> <p>6) The storage of solid waste on the site, until such time as it may be disposed of, must be in a manner acceptable to the local authority and DWA;</p> <p>7) Cover any wastes that are likely to wash away or contaminate storm water.</p>			
		Recycle material where possible and correctly dispose of unusable wastes	<p>1) Waste shall be separated into recyclable and non-recyclable waste, and shall be separated as follows:</p> <ul style="list-style-type: none"> • General waste: including (but not limited to) construction rubble, • Reusable construction material. <p>2) Recyclable waste shall preferably be deposited in separate bins;</p> <p>3) All solid waste including excess spoil (soil, rock, rubble etc) must be removed to a permitted waste disposal site on a weekly basis;</p> <p>4) No bins containing organic solvents such as paints and thinners shall be cleaned on site, unless containers for liquid waste disposal are placed for this purpose on site;</p>	<p>Sufficient containers available on site</p> <p>No visible signs of pollution</p>	Contractor	Daily Weekly

Aspect	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
			5) Keep records of waste reuse, recycling and disposal for future reference.			
	Increased fire risk to site and surrounding areas	To decrease fire risk.	1) Fires shall only be permitted in specifically designated areas and under controlled circumstances' 2) Fire extinguishers to be provided in all vehicles and fire beaters must be available on site; 3) Emergency numbers/ contact details must be available on site, where applicable.	No open fires on site that have been left unattended	Contractor	Monitor daily
Construction site	Geology and soils- *Unstable structured due to the underlying geotechnical conditions of the site; *Loss of valuable	To prevent the damaging of the existing soils and geology.	1) The top layer of all areas to be excavated for the purposes of construction shall be stripped and stockpiled in areas where this material will not be damaged, removed or compacted; 2) All surfaces that are susceptible to erosion, shall be protected either by cladding with biodegradable material or with the top layer of soil being seeded with grass seed/planted with a suitable groundcover.	Excavated materials correctly stockpiled No signs of erosion	Contractor	Monitor daily
		To prevent the loss	1) Stockpiling will only be done in	Excavated	Contractor of	Monitor daily

Aspect	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
	Topsoil	of topsoil To prevent siltation & water pollution.	designated places where it will not interfere with the natural drainage paths of the environment; 2) In order to minimize erosion and siltation and disturbance to existing vegetation, it is recommended that stockpiling be done/ equipment is stored in already disturbed/exposed areas; 3) Cover stockpiles and surround downhill sides with a sediment fence to stop materials washing away; 4) Remove vegetation only in areas designated during the planning stage; 5) Rehabilitation/ landscaping are to be done immediately after the involved works are completed; 6) All compacted areas should be ripped prior to them being rehabilitated/landscaped by the contractor as appointed by the individual erf owner; 7) The top layer of all areas to be	materials correctly stockpiled No visible signs of erosion and sedimentation Minimal invasive weed growth Vegetation only removed in designated areas	the Individual Developer	

Aspect	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
			<p>excavated must be stripped and stockpiled in areas where this material will not be damaged, removed or compacted. This stockpiled material should be used for the rehabilitation of the site and for landscaping purposes;</p> <p>8) Strip topsoil at start of works and store in stockpiles no more than 1,5 m high in designated materials storage area;</p> <p>9) During the laying of any cables, pipelines or infrastructure (on or adjacent to the site) topsoil shall be kept aside to cover the disturbed areas immediately after such activities are completed.</p>			
	Erosion and siltation	To prevent erosion and siltation	<p>1) It is recommended that the construction of the development be done in phases;</p> <p>2) Mark out the areas to be excavated;</p> <p>3) Large exposed areas during the construction phases should be limited. Where possible areas earmarked for construction during later phases should remain covered with vegetation coverage until the actual construction phase. This will prevent unnecessary erosion and siltation in</p>	<p>No erosion scars</p> <p>No loss of topsoil</p> <p>All damaged areas successfully rehabilitated</p>	Contractor	Monitor daily

Aspect	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
			<p>these areas;</p> <p>4) Unnecessary clearing of flora resulting in exposed soil prone to erosive conditions should be avoided;</p> <p>5) All embankments must be adequately compacted and planted with grass to stop any excessive soils erosion and scouring of the landscape if required;</p> <p>6) The eradication of alien vegetation should be followed up as soon as possible by replacement with indigenous vegetation to ensure quick and sufficient coverage of exposed areas by the applicant. This will be advantageous for cattle grazing as well.</p> <p>7) Storm water outlets shall be correctly designed to prevent any possible soil erosion;</p> <p>8) All surface run-offs shall be managed in such a way so as to ensure erosion of soil does not occur;</p> <p>9) Implementation of temporary storm water management measures that will help</p>			

Aspect	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
			<p>to reduce the speed of surface water by the individual erf owner / developer;</p> <p>10) All surfaces that are susceptible to erosion shall be covered with a suitable vegetative cover as soon as construction is completed by the individual erf owner / developer.</p>			
	<p>Hydrology</p>	<p>To ensure that:</p> <ul style="list-style-type: none"> -Construction works and structures are not flooded during heavy precipitation; -To minimise potential significant environmental damage due to extensive soil erosion, siltation and water pollution 	<p>The storm water management plan which has been developed prior to construction should be implemented on a continuous basis;</p>	<ul style="list-style-type: none"> -No damage caused to construction works and structures due to the effective management of floodwater; -No visible signs of Environmental damage in the form of erosion, water pollution etc. 	<p>Contractor Civil Engineers</p>	

Aspect	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
		To minimise pollution of soil, surface and groundwater	<p>-Increased run-off during construction must be managed using berms and other suitable structures as required to ensure flow velocities are reduced;</p> <p>-The contractor shall ensure that excessive quantities of sand, silt and silted water do not enter the storm water system.</p>	<p>No visible signs of erosion.</p> <p>No visible signs of pollution</p>	Contractor	Monitor daily
	Fauna and Flora	To protect the existing fauna and flora.	<p>1) All exotic invaders and weeds must be eradicated on a continuous basis;</p> <p>2) Exotic invaders must be included in an alien management program for the site. Eradication must occur every 3 months;</p> <p>3) No plants not indigenous to the area, or exotic plant species, especially lawn grasses and other ground-covering plants, should be introduced in the communal landscaping of the proposed site, as they will drastically interfere with the nature of the area;</p> <p>4) Where possible, trees naturally growing on the site should be retained;</p>	No exotic plants used for landscaping	Contractor Applicant	<p>As and when required</p> <p>Every 6 months</p>

Aspect	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
			5) Alien and invasive species must be removed.			
		To protect the existing fauna and flora.	1) Trees that are intended to be retained shall be clearly marked on site; 2) Snaring and hunting of fauna by construction workers on or adjacent to the study area are strictly prohibited and the Council shall prosecute offenders; 3) All mitigation measures for impacts on the indigenous flora of the area should be implemented in order to limit habitat loss as far as possible and maintain and improve available habitat, in order to maintain and possibly increase numbers and species of indigenous fauna; 4) Wood harvesting of any trees or shrubs on the study area or adjacent areas shall be prohibited; 5) Where possible, work should be restricted to one area at a time; 6) Noise should be kept to a minimum and the development should be done in phases to allow faunal species to temporarily	No measurable signs of habitat destruction	Contractor	As and when required

Aspect	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
			<p>migrate into the conservation areas in the vicinity;</p> <p>7) The integrity of remaining wildlife should be upheld, and no trapping or hunting by construction personnel should be allowed. Caught animals should be relocated to the conservation areas in the vicinity.</p> <p>8) 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.</p>			
			All Declared weeds and invaders should be removed from the open spaces on an ongoing basis.			
		To mitigate the negative impact on the ecological environment due to the installation of services	Rehabilitate areas which were disturbed by the instillation of services immediately after works have been completed	Disturbed areas successfully rehabilitated	Site Supervisor Contractor	
	Social, safety and security	To ensure the safety of the public	Although regarded as a normal practice, it is important to erect proper signs indicating the operations of heavy machinery in the	Visible signs erected	Contractor	

Aspect	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
			vicinity of dangerous crossings and access roads or erven in the development site if necessary.			
			With the exemption of the appointed security personnel, no other workers, friend or relatives will be allowed to sleep on the construction site (weekends included)		Security Personal contractor	
			<p>-Heavy construction vehicles should avoid using the local road network during peak traffic times;</p> <p>-These vehicles should use only specific roads, and strictly keep within the speed limits and abide to all traffic laws. No speeding or reckless driving should be allowed;</p> <p>- Access to the site for construction vehicles should be planned to minimize the impact on the surrounding road network ;</p> <p>-Warning signs should be erected on the roads if needed</p>			
			<p>The following actions would assist in the management of safety along the road:</p> <p>-Adequate road marking;</p>		Project Manager Heath and	

Aspect	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
			-Adequate roadside recovery areas; -Allowance for pedestrians and cyclists		Safety officer	
		To mitigate localized vibration	Activities that cause localised vibration should be limited to normal working hours only, between 07h00 and 18h00 on weekdays and between 08h00 and 13h00 on Saturdays. No construction activities will be allowed on Sundays, and public holidays.			
		Noise Impact- To maintain noise levels below “disturbing” as defined in the National Noise Regulations.	- Site workers must comply with the Provincial noise requirements; -Construction will only be permitted during working hours of between 07h00 and 18h00 on weekdays, and between 08h00 and 13h00 on Saturdays. No construction activities will be allowed on Sundays and Public Holidays; -The surrounding residents must be notified of blasting activities in advance. The necessary safety measures must also be implemented;	No complaints from surrounding residents and I & AP	Contractor	Monitored daily

Aspect	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
		<p>Dust Impact- Minimise dust from the site. To ensure the adequate protection of construction workers against dust pollution</p>	<p>-Dust pollution could occur during the construction works, especially during the dry months. Regular and effective damping down of working areas (especially during the dry and windy periods) must be carried out to avoid dust pollution that will have a negative impact on the surrounding environment</p> <p>-Stockpiles of fine material should be wetted and/or covered during windy conditions;</p> <p>-Workers on site should wear dust masks during dry and windy conditions;</p> <p>- 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.</p>	<p>No visible signs of dust pollution</p> <p>No complaints from surrounding residents and I & AP</p>	Contractor	Monitored daily
		<p>Visual Impact- In order to minimise the visual impact.</p>	<p>The disturbed areas shall be rehabilitated immediately after the involved construction works are completed as the construction vehicle and equipments will be causing visual impact during construction phase.</p>	Visual impacts minimized	Contractor	Monitor daily
		<p>To mitigate the inconvenience of</p>	<p>There should be consulted with affected parties to determine the most convenient</p>		Project Manage,	

Aspect	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
		temporary power failures, disconnection of water and sewage, and telecommunication	times for service disruptions. The interested and affected parties should also be notified in advance of dates that services will be disrupted.		Contractor	
		Increased fire risk to site and surrounding areas- To decrease fire risk.	-Fires shall only be permitted in specifically designated areas and under controlled circumstances. -Food vendors shall be allowed within specified areas. - Fire extinguishers to be provided in all vehicles and fire beaters must be available on site. -Emergency numbers/contact details must be available on site, where applicable.	No open fires on site that have been left unattended.	Contractor	Monitor daily
	Infrastructure and services	Installation of services	Determine areas where services will be upgraded and relocated well in advance. Discuss possible disruptions with affected parties to determine most convenient times for service disruptions and warn affected parties well in advance of dates that service disruptions will take place	No complaints from I & AP	Contractor ESO	When required
	Cultural Resources	To ensure the protection of heritage resources	If any graves or archaeological sites are exposed during construction work it should immediately be reported to a museum. The	No destruction of or damage to graves or	Contractor ESO	Monitor daily

Aspect	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
		if exposed during construction	report from the archaeologist must be provided to GDARD if any graves are recovered.	known archaeological sites		
	Vegetation	Loss of plants	<p>1) Aerate compacted soil and check and correct pH for soils affected by construction activities;</p> <p>2) Make sure plant material will be matured enough and hardened off ready for planting. Water in plants immediately as planting proceeds;</p> <p>3) Apply mulch to conserve moisture Plant according to the layout and planting techniques specified by the Landscape Architect in the Landscape Development plans for the site.</p> <p>4) Alien and invasive plants must be removed.</p>	Landscaping done according to landscape development plan	Landscape architect Contractor / Individual Developer	When required
		Spread of weeds	Ensure that materials used for mulching and topsoil/ fertilisers are certified weed free. Collect certifications where available. Control weeds growth that appears during construction.	Weed growth controlled	Landscape architect Contractor	When required
		To ensure rehabilitation of	1) Compacted soils shall be ripped at least 200mm;	Grass have hardened off	Contractor	Once a day Then every 4

Aspect	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
		the site	2) All clumps and rocks larger than 30mm diameter shall be removed from the soil to be rehabilitated; 3) The soil shall be levelled before seeding; 4) Hydroseed the soil with Potch mixture; 5) Watering shall take place at least once per day for the first 14 days until germination of seeds have taken place; 6) Thereafter watering should take place at least for 20 minutes every 4 days until grass have hardened off.			days

4.3 Operational Phase

Aspect	Environmental risk or issue	Objective or requirement	Mitigation measure	Responsibility	Frequency of Action
Feedlot activities in Operational Phase	Storm water control	Limit soil erosion and water pollution downstream	All canals on the feedlot development should always function correctly and be in good condition. After heavy rain, repairs should be done and the canals cleaned.	Owner Labourers	
	Solid Waste Management	Prevent contamination of surface or groundwater resources	<p><u>Removal and storage of solid waste:</u></p> <ul style="list-style-type: none"> • Most of the manure from cattle lot-fed in paddocks for relatively short periods is incorporated into the soil and the cattle should be periodically rotated between paddocks to ensure the manure loading is not excessive. • Manure from intensive feedlots, where the cattle are confined in high densities or on hard stand for extended periods, should be scraped up and removed as necessary. • The frequency with which pens are cleaned will depend on factors such as the stocking density and the size of the animals. • Manure should be stored in a stockpile on an impervious surface where water from rain, sprinklers or surface drainage cannot access the manure (or where any run-off drains back to holding ponds). • Manure can be stored for an extended period until it is used on the farm or is removed off-site for use or disposal in a manner approved by the relevant legislative body. • Low moisture content in the manure will minimise odour and generation of leachate. 	Owner Labourers	

Aspect	Environmental risk or issue	Objective or requirement	Mitigation measure	Responsibility	Frequency of Action
			<ul style="list-style-type: none"> • Aerobic composting of the manure (in turned piles or rows) may be used to stabilise the waste and reduce the incidence of disease-causing organisms. <p><u>Disposal of solid waste over land:</u></p> <ul style="list-style-type: none"> • The soil where solid feedlot waste is to be spread needs to be suitable for, and able to sustain, the agronomic regimes proposed. The disposal area also needs to be able to accommodate the water, nutrient, salt and organic loads involved. • Land application should be timed to promote most benefit to site vegetation and minimise leaching of nutrients to surface and groundwater. • Manure should be incorporated into the soil where possible. Otherwise, manure should be spread evenly over the land surface using a manure spreader of suitable design. • Vegetation cover should be maintained on the disposal area to prevent soil erosion and to enhance nutrient uptake. 		
	Liquid Waste Management	Nutrient-rich wastewater should not contaminate any surface water body or groundwater resource.	<p><u>Removal of liquid waste:</u></p> <ul style="list-style-type: none"> • Clean stormwater should be channelled away from the feedlot area, using bunds, culverts or drains, to ensure it does not become contaminated with manure or urine. • Any contaminated water from areas outside the feedlot, including stormwater run-off, should (wherever possible) be directed via drains to a settling pond lined with very low 	Owner Labourers	

Aspect	Environmental risk or issue	Objective or requirement	Mitigation measure	Responsibility	Frequency of Action
			<p>permeability clay or plastic. This water should then be suitable for discharge to an irrigation area.</p> <ul style="list-style-type: none"> • Surface run-off from the feedlot should be collected in a drainage channel, with a sufficient cross-section. To prevent effluent being washed into a watercourse, all contaminated flows should be directed to stabilisation ponds for treatment before being spread over land by tanker or irrigation. • Where liquid and solid waste is combined and drain to a pond, effluent treatment is recommended using a multi-pond stabilisation system, incorporating anaerobic and aerobic treatment. <p><u>Storage of liquid waste in settling ponds:</u></p> <ul style="list-style-type: none"> • Where possible, solids and larger suspended matter should be removed from the effluent stream by the use of coarse screening equipment prior to entering a settling pond. • The capacity of any settling pond should provide adequate retention time for entrained solids to settle out (one and a half to two hours are normally satisfactory). • Adequate free board should be provided to prevent stormwater overflowing from the pond. The outflow from the settling pond should be conveyed either to a holding pond before irrigation over land or to wastewater stabilisation ponds. Captured solids should be 		

Aspect	Environmental risk or issue	Objective or requirement	Mitigation measure	Responsibility	Frequency of Action
			<p>applied to land in a sustainable manner using crop nutrient needs and status of soil. The nutrient loading to land is a cumulative loading from all sources, i.e. solid manures, liquids and any artificial fertiliser added.</p> <p><u>Disposal of liquid waste over land:</u></p> <ul style="list-style-type: none"> • In some instances, it may be possible to retain all liquid waste for evaporation in shallow ponds. Liquid waste can be disposed of raw or after treatment (e.g. by ponding). Treatment will reduce the Biological Oxygen Demand (BOD) of the effluent and will allow the waste to be applied over a much smaller area due to reduced odours. The waste disposal area should be located at such a distance that it would not contaminate surface and groundwater resources. • Where wastewater is irrigated over aquifers, monitoring may be required to allow early detection and management of adverse environmental impacts. • Sufficient land disposal area should be available for a 10 to 14-day rest period between applications on any given part of the area, the objective being to alternate between anaerobic and aerobic conditions in the top layer of soil. Shorter periods may be acceptable under dry summer conditions. • Crops or pasture should be maintained to take up as much as possible of the nitrogen and phosphorus from the wastewater to prevent pollution of any ground or surface 		

Aspect	Environmental risk or issue	Objective or requirement	Mitigation measure	Responsibility	Frequency of Action
			waters and minimise erosion. Irrigation systems may include (1) Flood irrigation, (2) Sprinkler irrigation and (3) Trickle irrigation. The latter is generally not suitable for effluent, due to clogging problems.		
	Effluent dam control	Limit water contamination	The effluent dams should be monitored regularly for leaks and should be repaired accordingly.	Owner Labourers	
	Irrigation via the effluent dams	Limit water contamination	The irrigation of waste water should be done according to the conditions stipulated in the Water Use License. Irrigation activities may only commence once a Water Use License has been granted by the Department of Water Affairs.	Owner Labourers	
	Alien Invasive Plant Monitoring	Limit the establishment of alien invasive plant species	Aliens and invasive plant species should be eradicated and managed on the study area. An Invasive species control plan should be implemented at least every 3 months of the operational phase..	Owner Labourers	
Site cleanup and prepared for use	Storm water pollution	Do not allow any materials to wash into the storm water system.	Remove erosion and sediment controls only if all bare soil is sealed, covered or re-vegetate. Sweep roadways clean and remove all debris from kerb and gutter areas. Do not wash into drains.	Contractor	
	Waste management	Minimise waste	Decontaminate and collect waste in storage area ready for off-site recycling or disposal.	Contractor	

Aspect	Environmental risk or issue	Objective or requirement	Mitigation measure	Responsibility	Frequency of Action
			Arrange for final collection and removal of excess and waste materials.		
General	Waste management		No waste material shall at any stage be disposed off in the adjacent open spaces.	Contractor Maintenance	To be agreed
			Open fires and smoking during maintenance works are strictly prohibited.	Contractor Maintenance Contractor	
Materials failure	Structural damage. Loss of site materials.		Inspect all structures monthly to detect any cracking or structural problems. Confirm with designer if there are design problems. Rectify with materials to match, or other agreed solution.	Contractor	
Drainage failure	The flooding of structures and basements etc, due to drainage failure	To ensure effective storm water management on site during the operational phase	All site drainage works should be inspected and maintained on a continues basis	Maintenance Contractor	
Site audit	Eventual project failure	Successful project establishment	Routinely audit the works and adjust maintenance schedule accordingly.	Contractor	

February 2014

5 PROCEDURES FOR ENVIRONMENTAL INCIDENTS

5.1 Leakages & spills

- Identify source of problem.
- Stop goods leaking, if safe to do so.
- Contain spilt material, using spills kit or sand.
- Notify Environmental Control Officer
- Remove spilt material and place in sealed container for disposal (if possible).
- Environmental Control Officer to follow Incident Management Plan.

5.2 Failure of erosion/sediment control devices

- Prevent further escape of sediment.
- Contain escaped material using silt fence, hay bales, pipes, etc.
- Notify ECO.
- Repair or replace failed device as appropriate.
- Dig/scrape up escaped material; take care not to damage vegetation.
- Remove escaped material from site.
- ECO to follow Incident Management plan.
- Monitor for effectiveness until re-establishment.

5.3 Bank/slope failure

- Stabilize toe of slope to prevent sediment escape using aggregate bags, silt fence, logs, hay bales, pipes, etc.
- Notify ECO.
- ECO to follow Incident Management plan.
- Divert water upslope from failed fence.
- Protect area from further collapse as appropriate.
- Restore as advised by ECO.
- Monitor for effectiveness until stabilized.

5.4 Discovery of rare or endangered species

- Stop work.
- Notify ECO.
- If a plant is found, mark location of plants.
- If an animal, mark location where sighted.
- ECO to identify or arrange for identification of species and or the relocation of the species if possible.
- If confirmed significant, ECO to liaise with Endangered Wildlife Trust.
- Recommence work when cleared by ECO.

5.5 Discovery of archaeological or heritage items

- Stop work.
- Do not further disturb the area.
- Notify ECO.
- ECO to arrange appraisal of specimen.
- If confirmed significant, ECO to liaise with National, Cultural and History Museum.
P.O. Box 28088
SUNNYSIDE
0132
Contact Mr. J. van Schalkwyk
or Mr.Naude
- Recommence work when cleared by ECO.

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6 EMP REVIEW

1. The Site supervisor is responsible for ensuring the work crew is complying with procedures, and for informing the work crew of any changes. The site supervisor is responsible for ensuring the work crew is aware of changes that may have been implemented by GDARD before starting any works.
2. If the contractor cannot comply with any of the activities as described above, they should inform the ECO with reasons within 7 working days.

Enlarged Figures

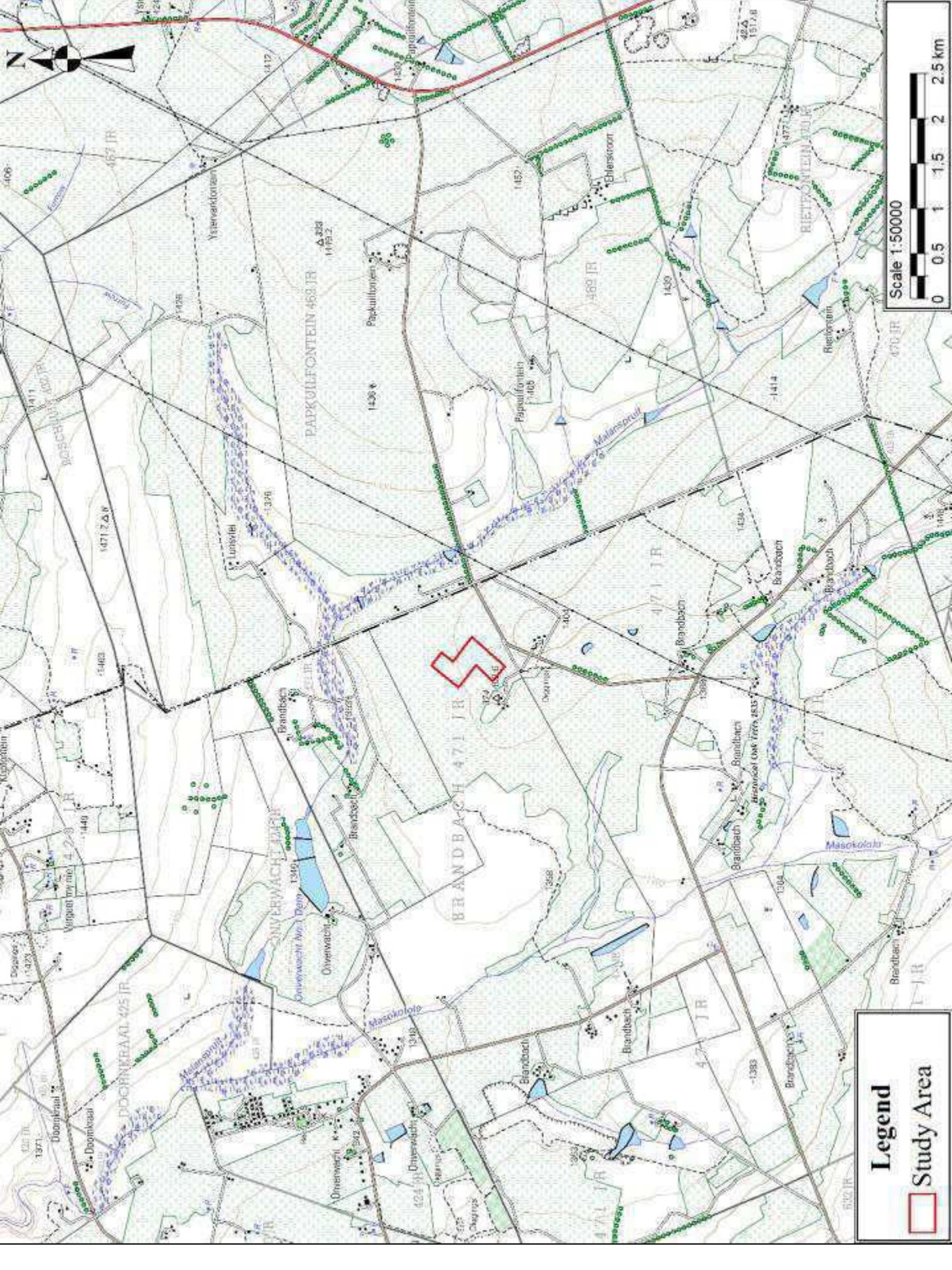


Appendix I

Locality Map Figure 1



Appendix I1



Scale 1:50000



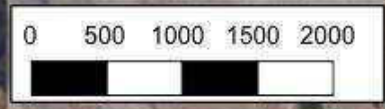
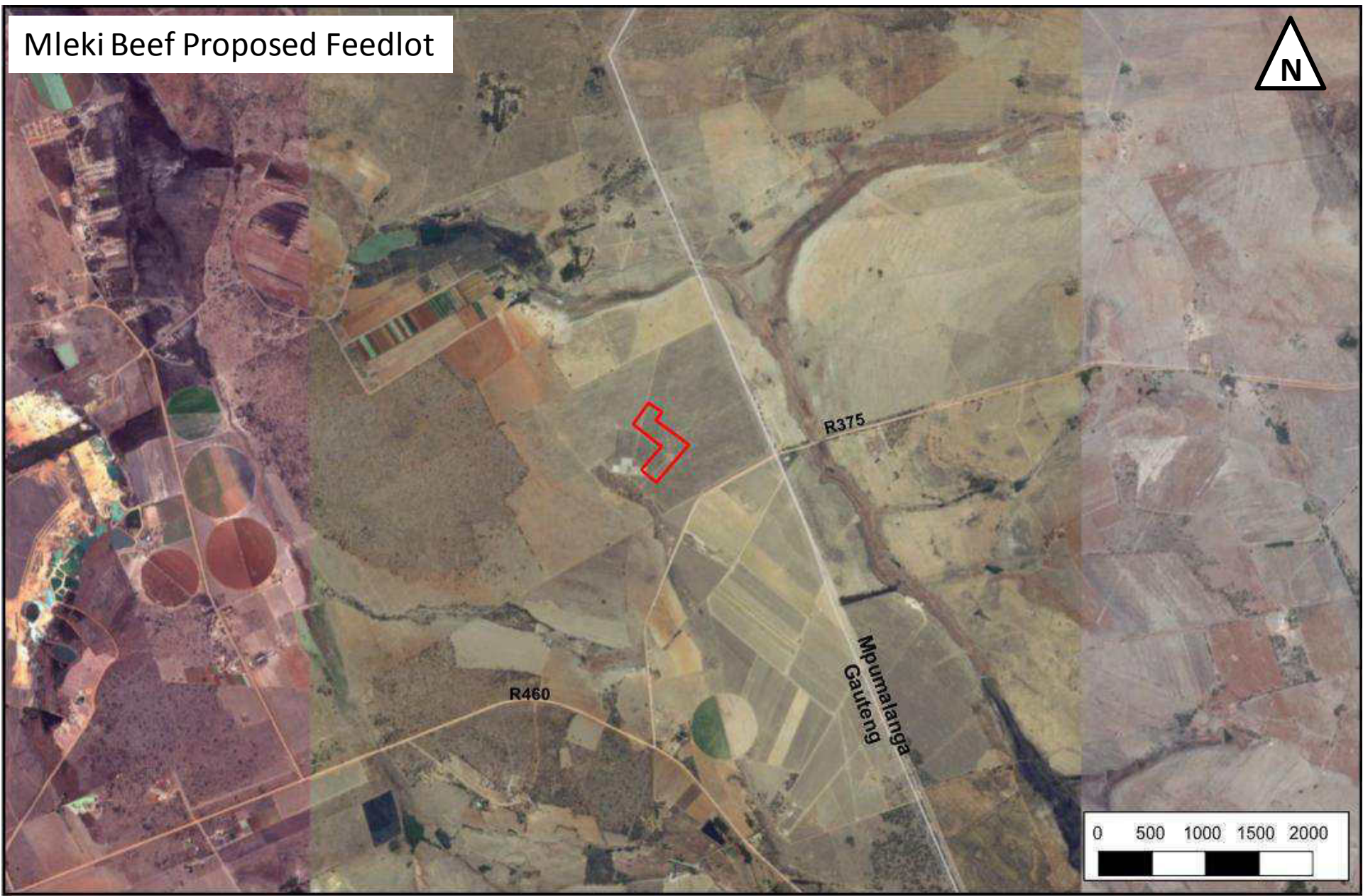
Legend

 Study Area

**Aerial Map
Figure 2**



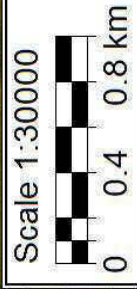
Mleki Beef Proposed Feedlot



Hydrology Map Figure 3



Appendix 13



Legend

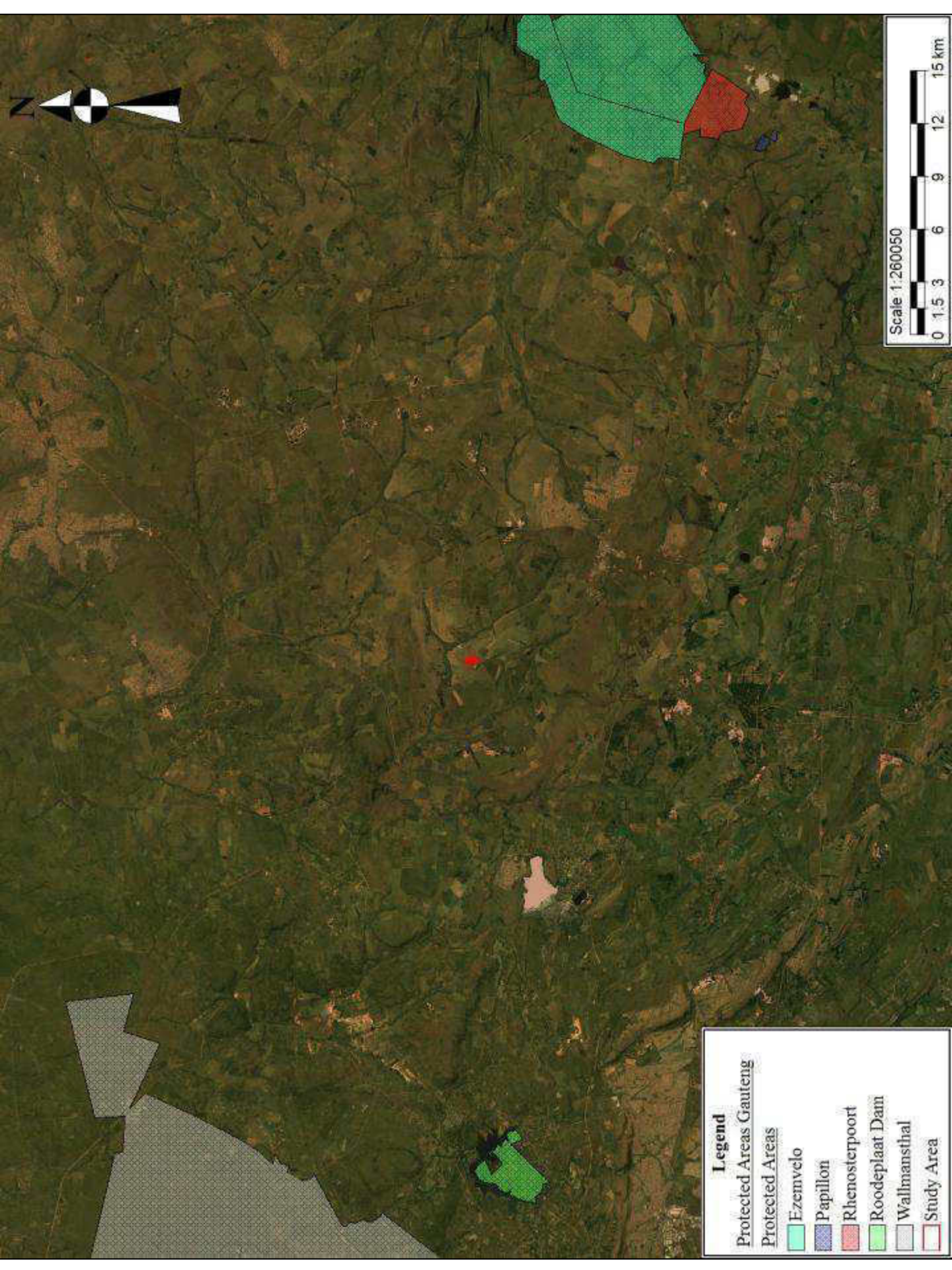
Rivers		Non-Perennial
Wetlands		Wetland
		Waterbody
		Study Area

Protected Areas Map

Figure 4



Appendix 14



Scale 1:260050



Legend

Protected Areas Gauteng

Protected Areas

- Ezemvelo
- Papillon
- Rhenosterpoort
- Roodeplaat Dam
- Wallmanssthal
- Study Area

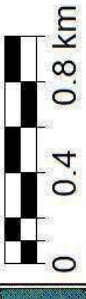
Irreplaceable sites Map Figure 5



Appendix 15



Scale 1:30000



Legend

- C. Plan area
- Irreplaceable
 - Prior Quat Catch, Prim veg
 - RL bird hab, Prior Quat Catch
 - RL bird hab, Prior Quat Catch, Prim veg
 - RL plant hab, RL bird hab, Prior Quat Catch, Prim veg
- Study Area

**Ridges Map
Figure 6**



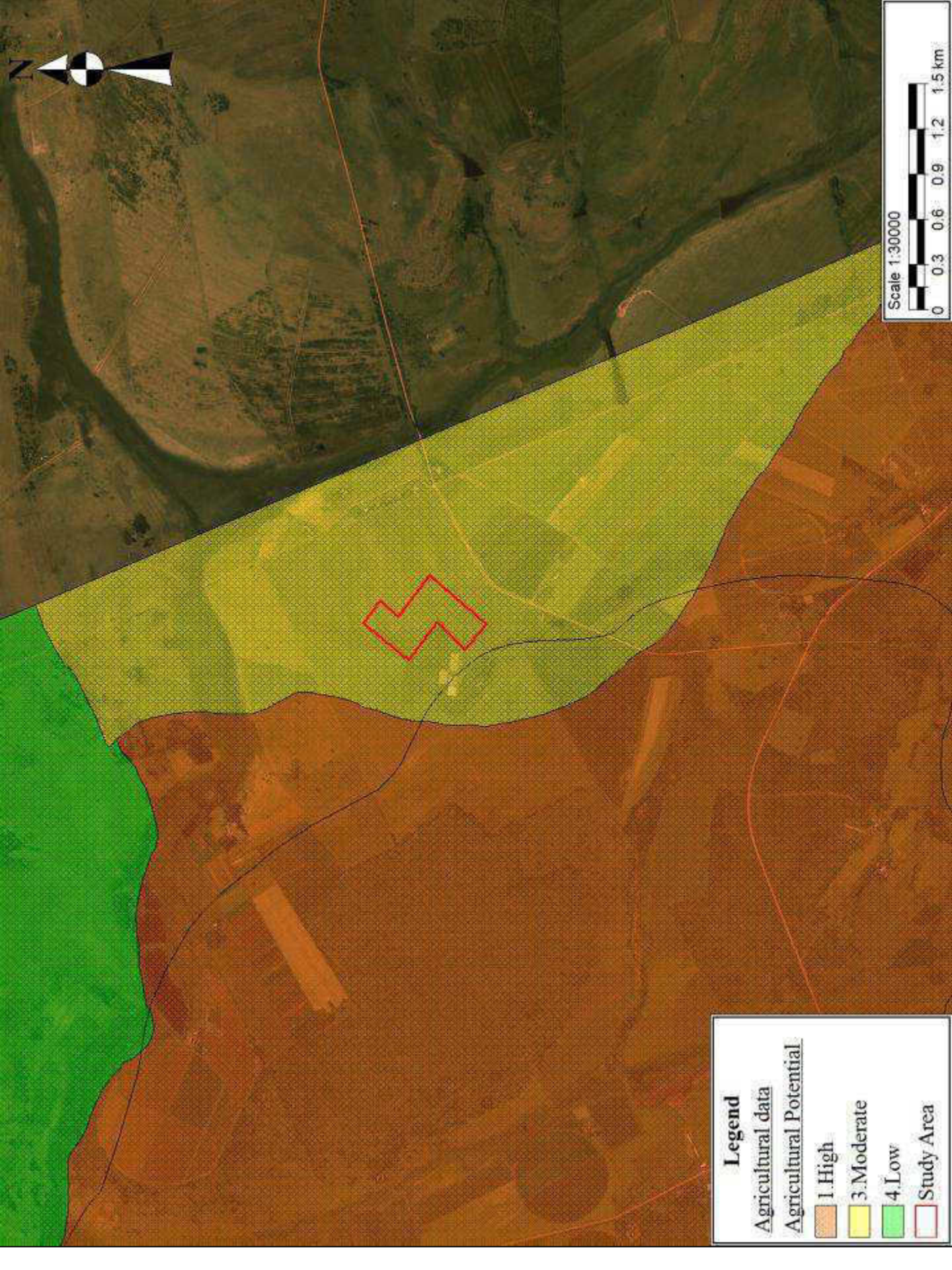


Agricultural Potential Map

Figure 7



Appendix 17



Legend

Agricultural data

Agricultural Potential

- 1. High
- 3. Moderate
- 4. Low
- Study Area

Scale 1:30000

0 0.3 0.6 0.9 1.2 1.5 km

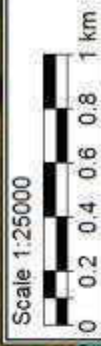


Agricultural Hubs Map

Figure 8



Appendix 18



Scale 1:25000

Legend

-  Study Area
-  Agricultural Hub
-  Nokeng

**Urban Edge Map
Figure 9**



Appendix 19



Scale 1:63360

Legend

Urban Edge

Urban_Edge

Study Area

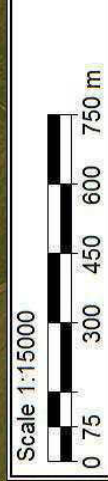
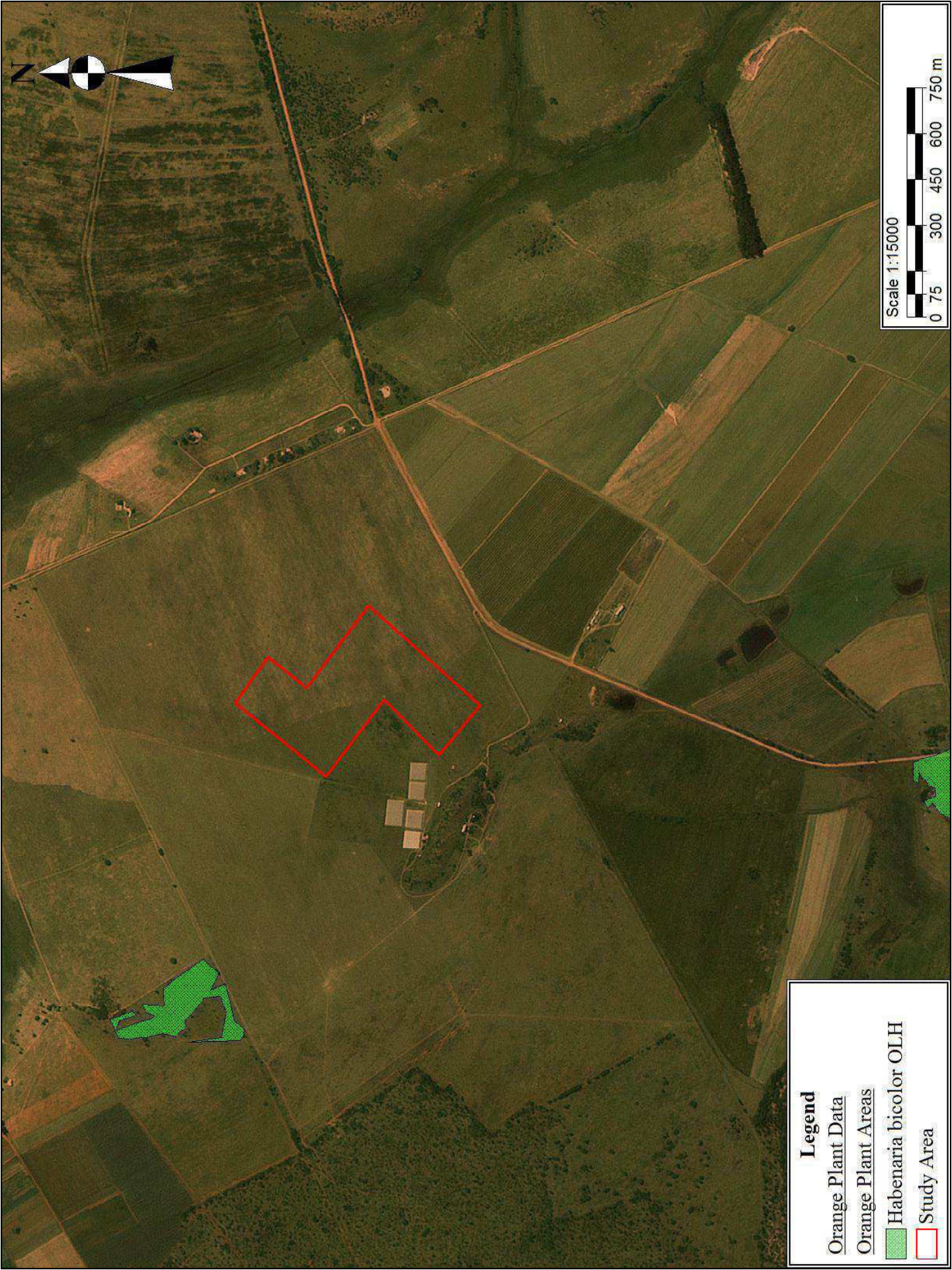


Orange Data Plants Map

Figure 10



Appendix I10



Legend

- Orange Plant Data
- Orange Plant Areas
- Habenaria bicolor OLH
- Study Area

**Soils Map
Figure 11**





Legend

Agricultural data

Soil

- Limiting soil depth
- Limiting soil depth, impeded internal drainage, rock outcrops
- Limiting soil depth, low clay content, impeded internal drainage
- Study Area

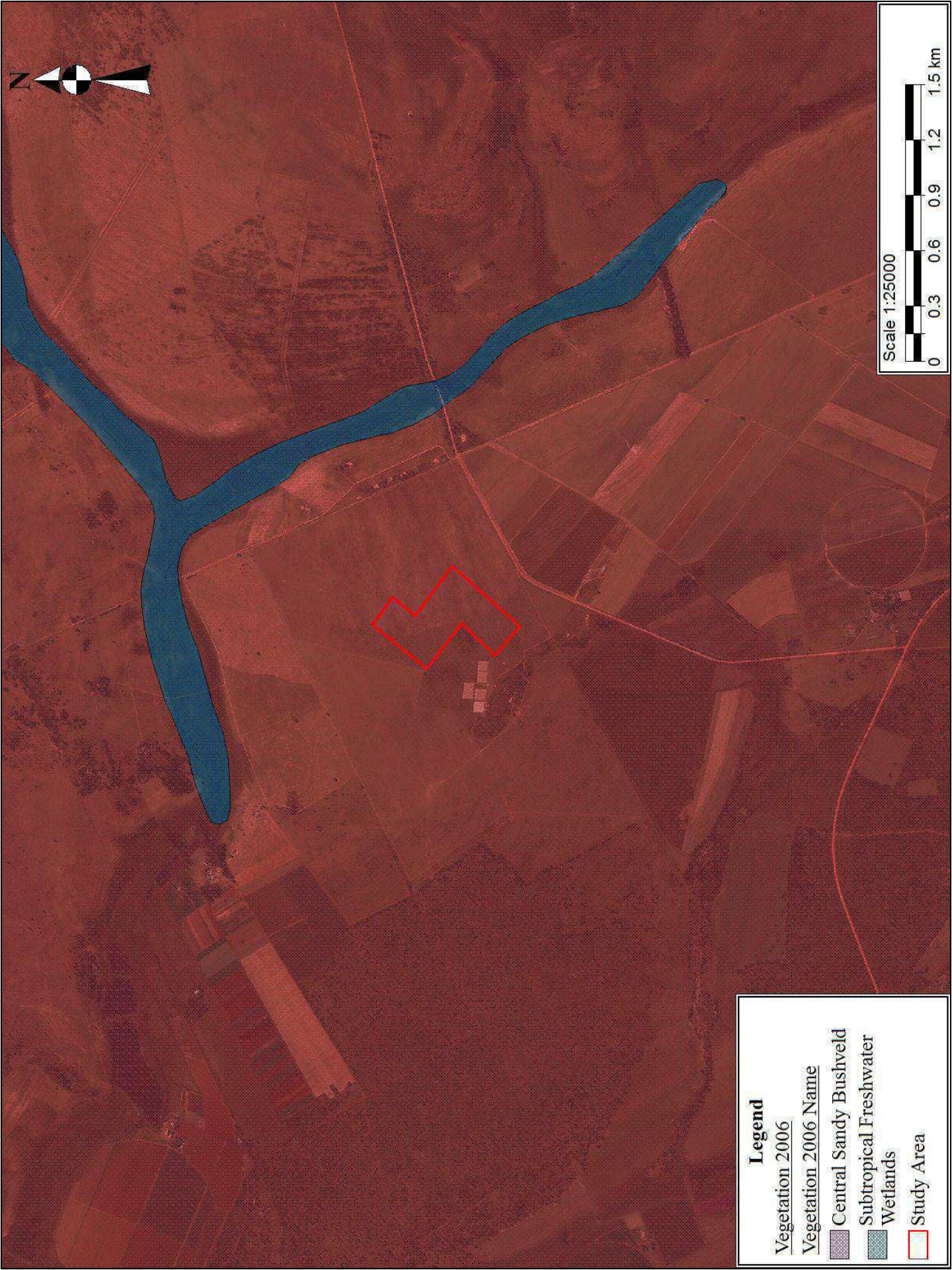
Scale 1:30000

0 0.3 0.6 0.9 1.2 1.5 km

Vegetation Groundcover Map

Figure 12





Legend

Vegetation 2006

Vegetation 2006 Name

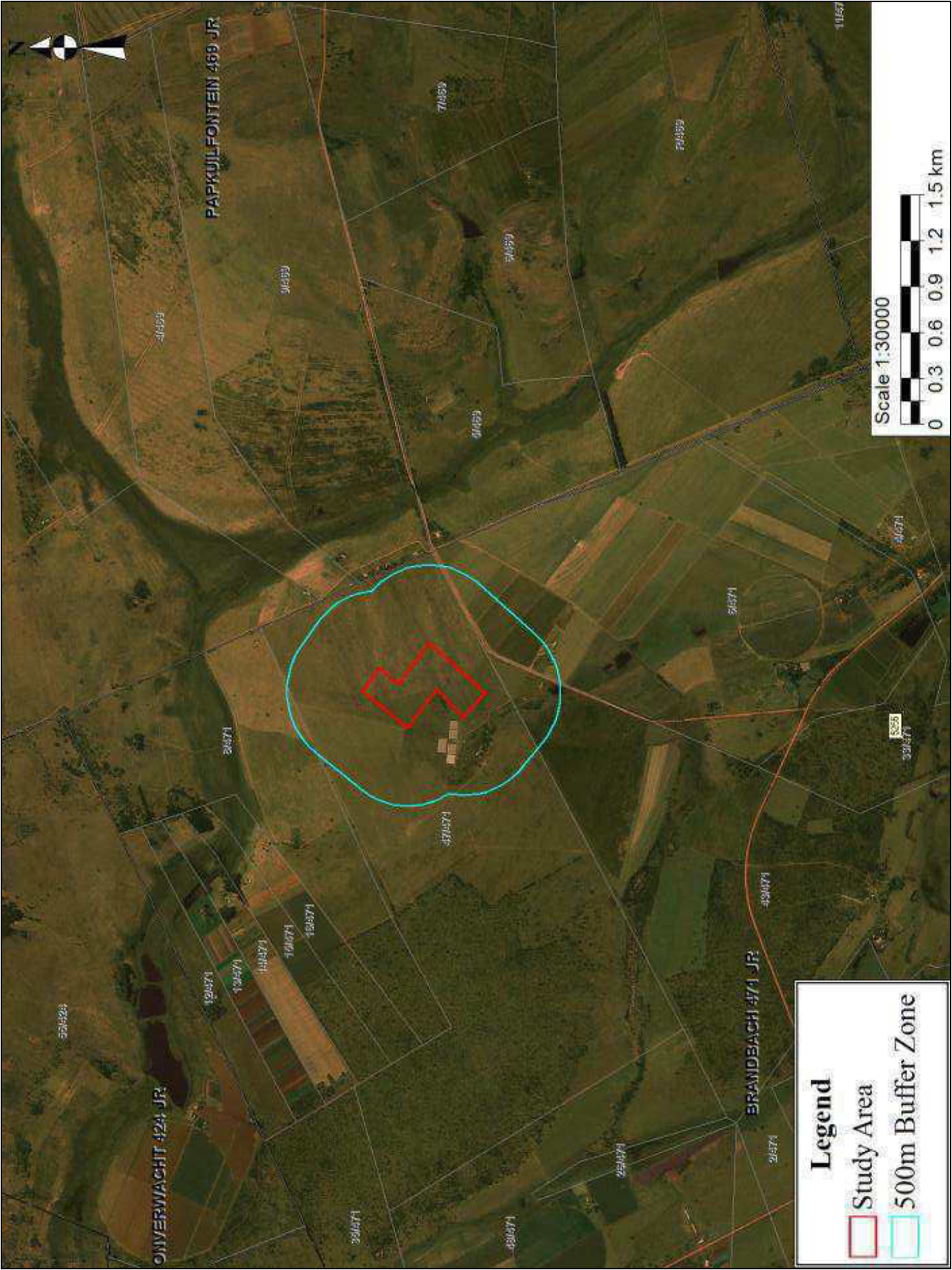
- Central Sandy Bushveld
- Subtropical Freshwater
- Wetlands
- Study Area

Scale 1:25000

0 0.3 0.6 0.9 1.2 1.5 km

**Surrounding Land-Uses Map
Figure 13**





ONVERWACHT 424 JR

PAKKUIJL FONTEIN 469 JR

BRANDBACH 471 JR

Legend

- Study Area
- 500m Buffer Zone

Scale 1:30000

0 0.3 0.6 0.9 1.2 1.5 km

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



Appendix J



Bokamoso

Landscape Architects &
Environmental consultants

P.O. BOX 11375
Maroofana
0161

Tel: (012) 246 2810
Fax: (086) 570 5559

E-mail: izaliba@bokamoso.co.za
Website: www.bokamoso.net

- 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



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.



Bokamoso
Pty Ltd

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.

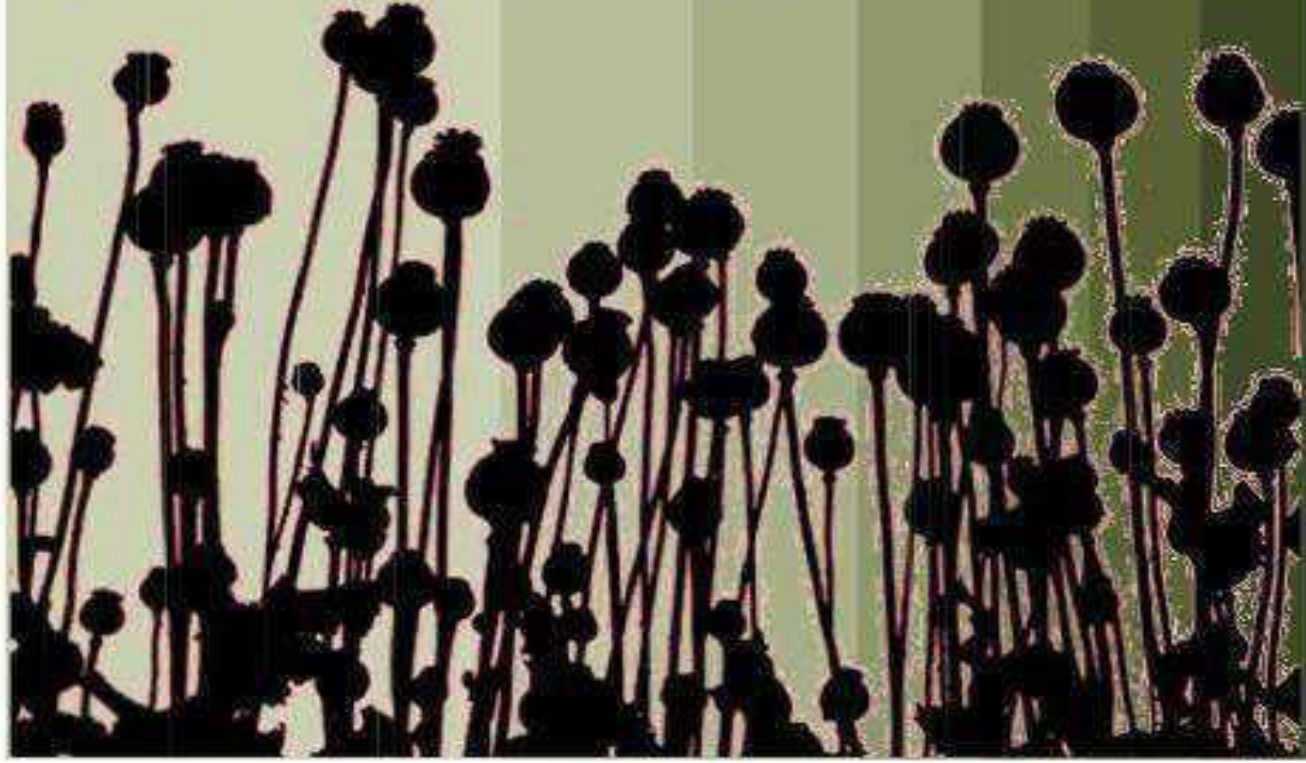
Mission:

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

بکاموسو
Bokamoso



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.



Bokamoso
Pty Ltd

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 18 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 GAUTFIANS/former PWV Consortium with Environmental input and reports regarding road network plans, road determinations, preliminary and detailed designs for the past 12 years.



Bokamoso

03 Human Resources

032 Members

Consulting

Mientjie Coetzee

MSc Medical Sciences (US)

BSc (Hons) Medical Sciences (US)

More than 8 years experience in the compilation of various environmental reports

Ane 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)

Project Manager

More than 10 years experience in the compilation of various environmental reports

Qiqqa Nkangana

BA Environmental Management (UNISA)

Specialises in compiling various environmental reports.

Nicolene Lotter

BSc (Hons) Environmental Science (NWU)

BSc Tourism (NWU)

1 year 4 months experience in the field of Environmental Sciences.

Specialises in Water Use License Applications

Ben Bhukwana

BSc Landscape Architecture (UP)

More than 4 years experience in the field of Landscape Architecture.

Specialises in Landscape Design, ECO & Environmentalist in training.

Marli Burger

B-Tech Nature Conservation (TUT)

N. Dip. Nature Conservation (TUT)

EM' Training (GDARD/University of Pretoria)

5years Biodiversity Enforcement & Awareness Training experience

Specialises in Water Use Licences



Anton Nel

B-Tech Landscape Technology (TUT)
N Dip Landscape Technology (TUT)
1 year experience in ECO
Specialises in Basic Assessment Reports

Juanita de Beer

Events Management and Marketing (Damelin)
Specializes in Public relations and public participation processes

Mary-Lee Potgieter

Msc Plant Science (UP)
BSc (Hons) Plant Science (UP)
BSc Ecology (UP)
1 year 5 months working experience in the Environmental field
Specialises in ECO works, Basic Assessments, EIA's, and Flora Reports

Alfred Thomas

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

Maretha Roux

Effective People Management (UCT)
18 years management experience
Specializes in AutoCAD, Visio, Accounting, and Administration
Compiling of various Environmental Reports/
Assisting Project Management
Photographer



Bokamoso

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
18 years experience in landscape contracting works..

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



03 Human Resources

035 Personnel

01 Environmental Management Services

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

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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

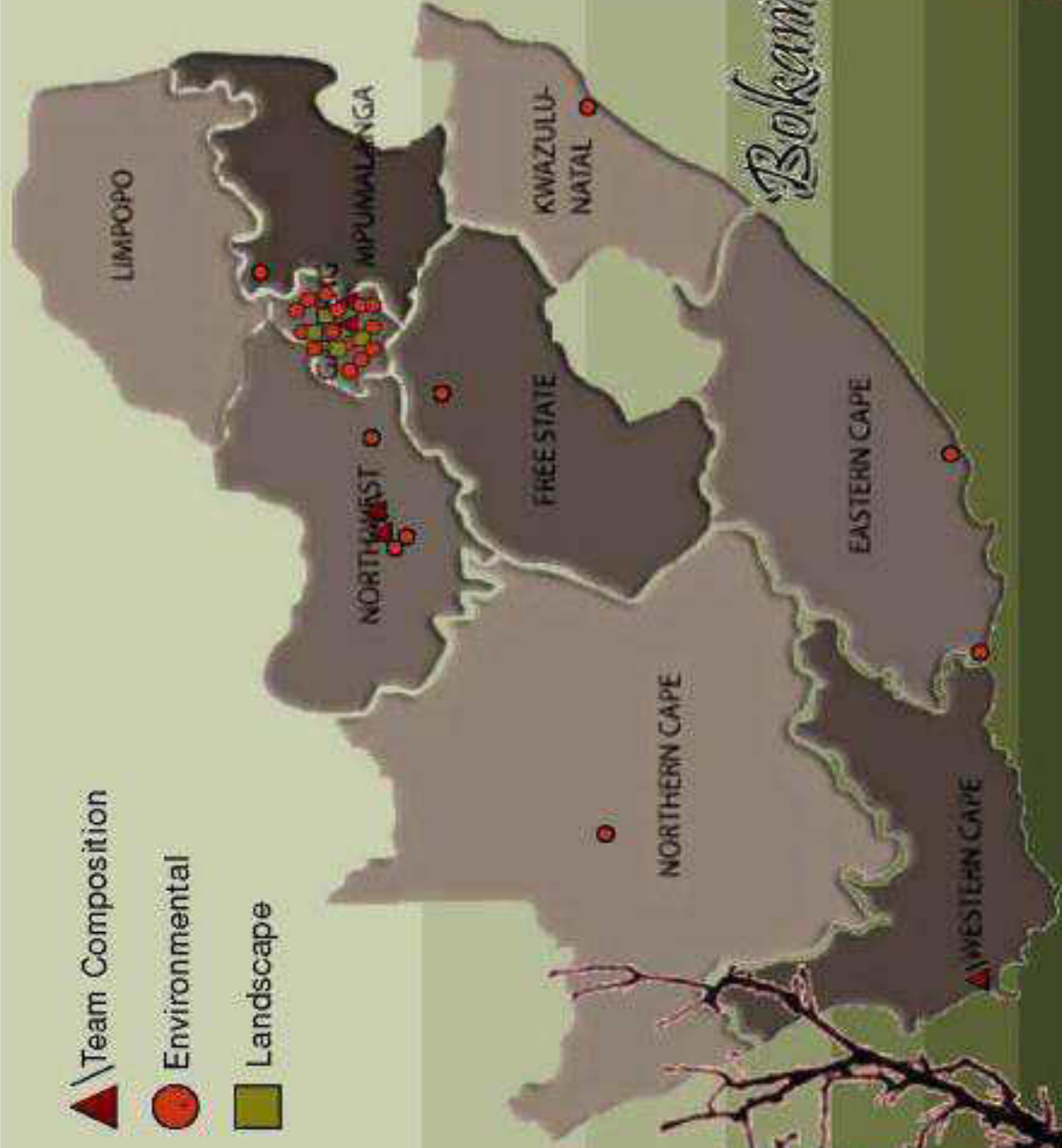


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Pty Ltd

04 Services

04.2 Contracting Services

- ▲ Team Composition
- Environmental
- Landscape



Bokamoso

04 Services

043 Orientation

01 Valpre Bottling Plant, Heidelberg



project

shelter

site plan

Bokamoso

05 Landscape Projects- Current

051 Commercial



01 Valpre Bottling Plant, Heidelberg



Bokamoso



05 Landscape Projects - Current

051 Commercial

01 Valpre Bottling Plant, Heidelberg

concept plan

natural veld

gatehouse

veldgrass

feature planting

entrance water features

planting areas



project

gatehouse



natural veld

veldgrass

seating benches

teraced garden to accommodate visitors

Cynodon lawn

project

front garden



veldgrass

Cynodon discoloripes



Bokamoso



05 Landscape Projects- Current

051 Commercial

01 Valpre Bottling Plant, Heidelberg

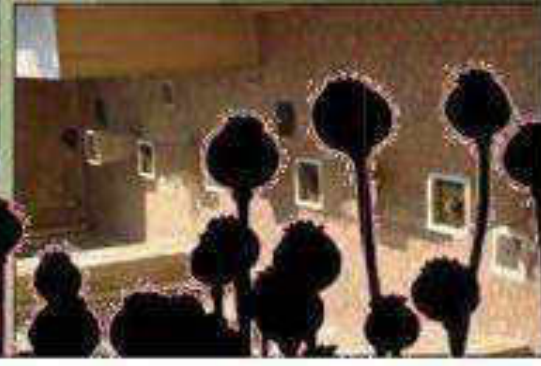
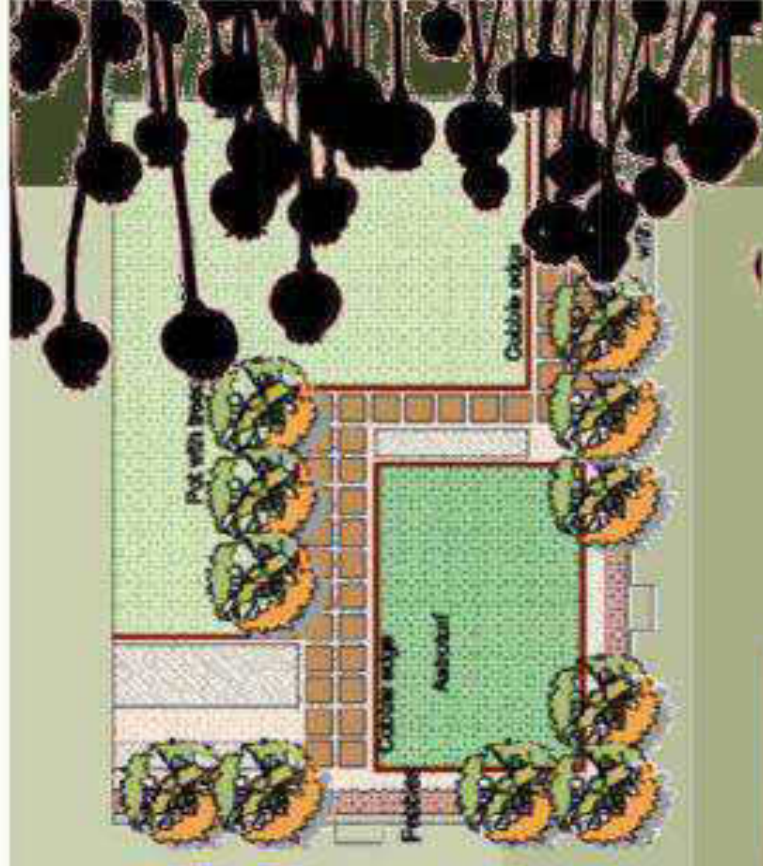


05 Landscape Projects - Current

05.1 Commercial

Bokamoso

03 Grain Building, Pretoria



05 Landscape Projects - Completed
053 Offices

04 Ismail Dawson offices, Pretoria



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05 Landscape Projects – Conceptual

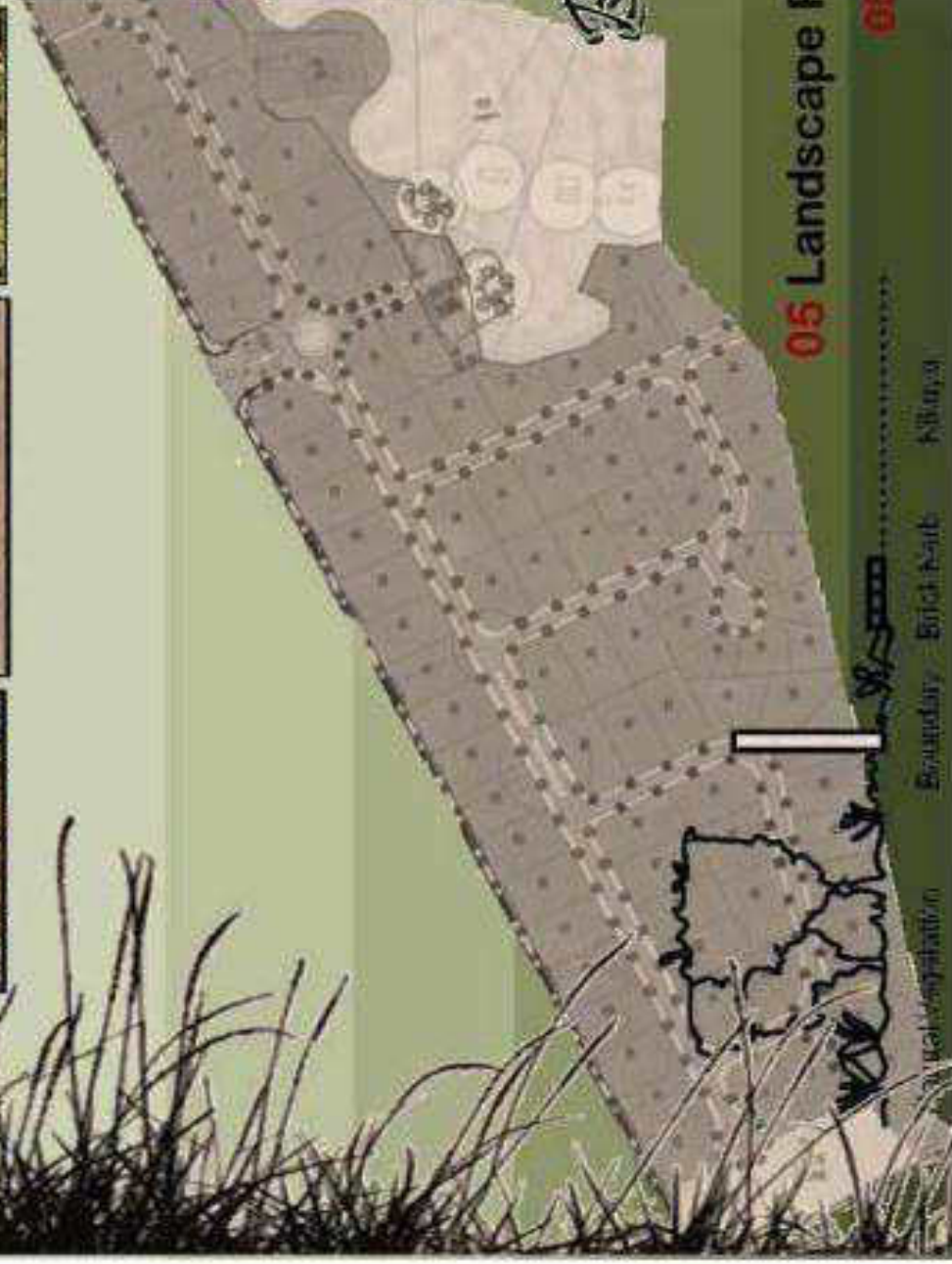
053 Offices



05 Celtic Manor, Pretoria



Bokamoso



05 Landscape Projects - Completed
654 Complex Development

Boundary Birch Park Klerksd

Welkompton

05 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

Landscape Projects – Completed
055 Residential

09 The Wilds, Pretoria N-



Bokamoso

05 Landscape Projects – Completed

055 Residential

010 The Wilds, Pretoria



Bokamoso

005 L'Orangerie De Bijvoets Completed
005 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

Bokamoso



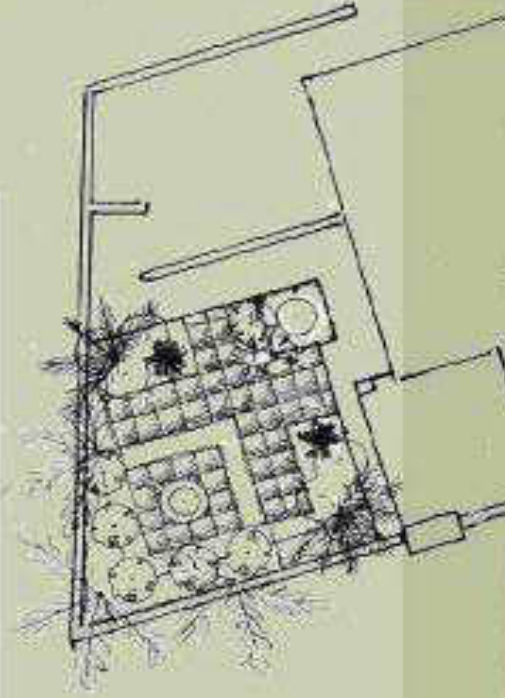
013 Forest Garden, Pretoria



Bokamoso
Landscape Architects

Landscape Projects – Completed
055 Residential

016 Forest Garden, Pretoria

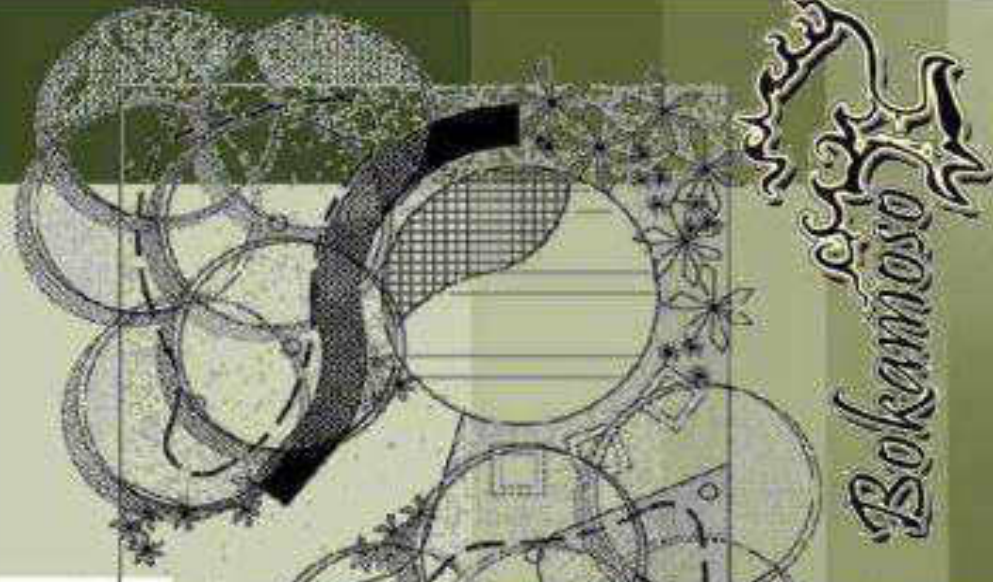


Bokamoso

05 Landscape Projects - Completed
055 Residential

01 Safari Garden Expo

Received a Silver Certificate at the Safari Garden Expo, 2010



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06 Corporate Highlights

061 Awards

02 UNISA Sunnyside Campus, Pretoria
Best Commercial Paving Plan in Gauteng. 1997



06 Corporate Highlights

081 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 X1	In Progress	Scoping & EIA
Doomvallei Phase 6 & 7	In Progress	EIA
Engen Interchange	In Progress	Scoping & EIA
Erasmia X15	In Progress	EIA
Franschoot	In Progress	EIA
K113	Amendment of ROD	EIA
K220 East	ROD	EIA
K220 West	ROD	EIA
K54 ROD conditions	In Progress	EIA
Knopselaagte 9.5/Peachtree	ROD	EIA
Knopselaagte portion 20 & 21	ROD	EIA
Lilliesiel/Nootgedacht	In Progress	EIA
Mooiplaats 70 (Sutherland)	In Progress	EIA
Naauwpoort 1 - 12/Valley View	In Progress	EIA
PeachTree X5	In Progress	EIA
Snydfontein 60	In Progress	EIA
Thaba Mbiswere	In Progress	Scoping & EIA
Maklaats	In Progress	EIA
Waterval Valley	In Progress	EIA
Environmental Opinion		
Doomkloof 69 (Rogss)	In Progress	Opinion
Monawoni X 53	In Progress	SA & Opinion
Mookkoot (USN)	In Progress	Opinion
Norwood Mall/Santspruit	In Progress	Opinion
Riversong X 9	In Progress	Opinion
SadiScheme	In Progress	Opinion
USN Banich 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
Harbeeshoek 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
Olivenhoutbosch Road	In Progress	ECO
Orchards 39	In Progress	ECO
Pierre van Rynsveld Reservoir	In Progress	ECO
Project Shelter	In Progress	ECO

S24-G		
Wonderboom	In Progress	S24-G
Mogwasi Guest houses	Completed	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 & EA
Doornpoort Filling Station	In Progress	DFA & EIA & Scoping
Eastwood Junction	In Progress	DFA
Ingersd Road (Erf 78, 81 - 83)	In Progress	DFA
Rooi Senekal	In Progress	DFA & EIA & Scoping
Thaba Meitse 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 45	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 Poth	In Progress	WULA
Jozini Shopping Centre	In Progress	WULA+BA
K60	Completed	WULA
Malabo Roads	In Progress	WULA
Kwazele Sewerage Works	In Progress	WULA
Monatoni External Services	In Progress	WULA+BA
Nyathi Eco Estate	In Progress	WULA
Prinses Glants 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
Mbnavoni Shopping Centre	Completed	EMP
Forest Hill Development	Completed	EMP
Wetvreden Farm 105KG	Completed	EMP+EIA
Roslouw 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
Veimore Hotel	Completed	Rehabilitation
Grace Point Church	Completed	Rehabilitation
Mmametodi Pipeline	Completed	Rehabilitation

Visual Impact Assessment		
Swazkop Industrial Development	Completed	Assessment +DFA
Erasmia	Completed	Assessment

Signage Application		
Marilyn 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
- Cento 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



- 
- 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

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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.

Waste Management Plan (WMP)



Appendix K

March 2014

Draft Waste Management Plan (WMP) for the Proposed Cattle Feedlot

Ref nr: GAUT 002/12-13/E0222

BOKAMOSO
LANDSCAPE ARCHITECTS &
ENVIRONMENTALCONSULTANTS CC
P.O. BOX 11375
MAROELANA
0161

TEL: (012) 346 3810
Fax: 086 570 5659
Email: lizelleg@mweb.co.za



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2.2	WMP context	4
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5.1	Establishment of a Successful Recycling Programme	7

LIST OF FIGURES:

Figure 1: Locality Map

Figure 2: Aerial Map

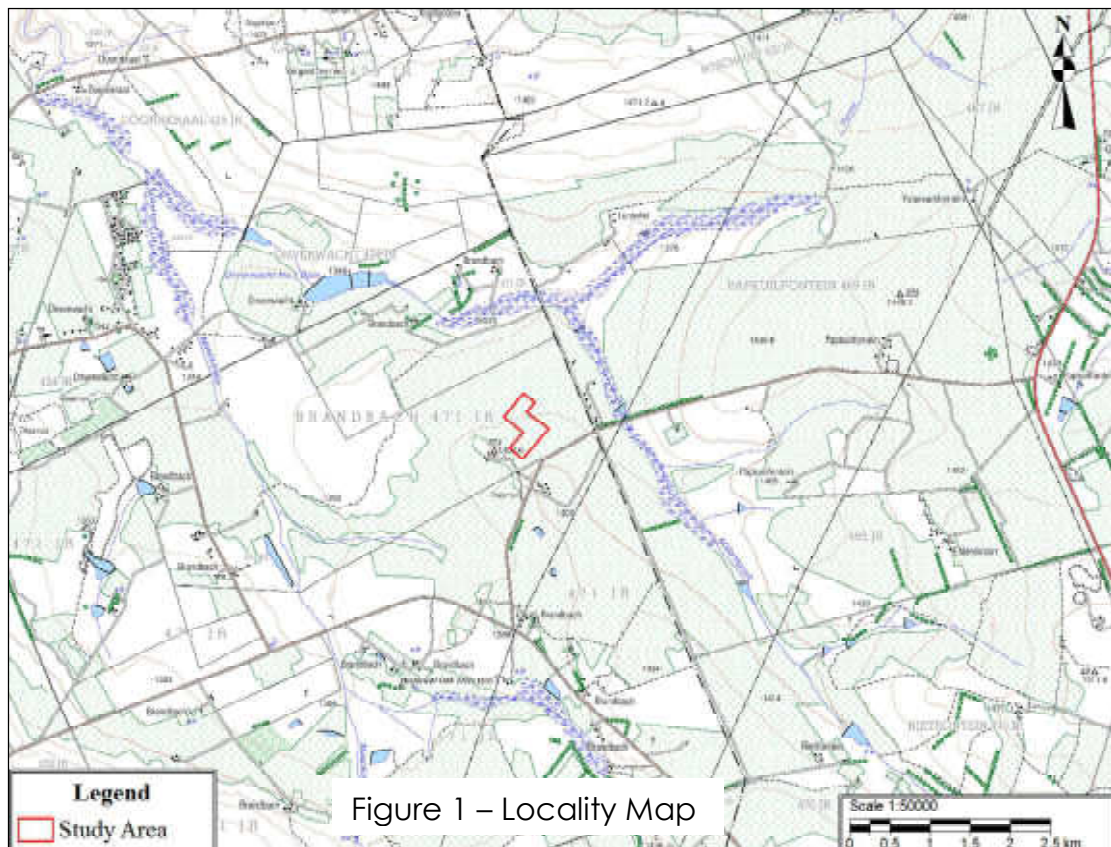
LIST OF TABLES:

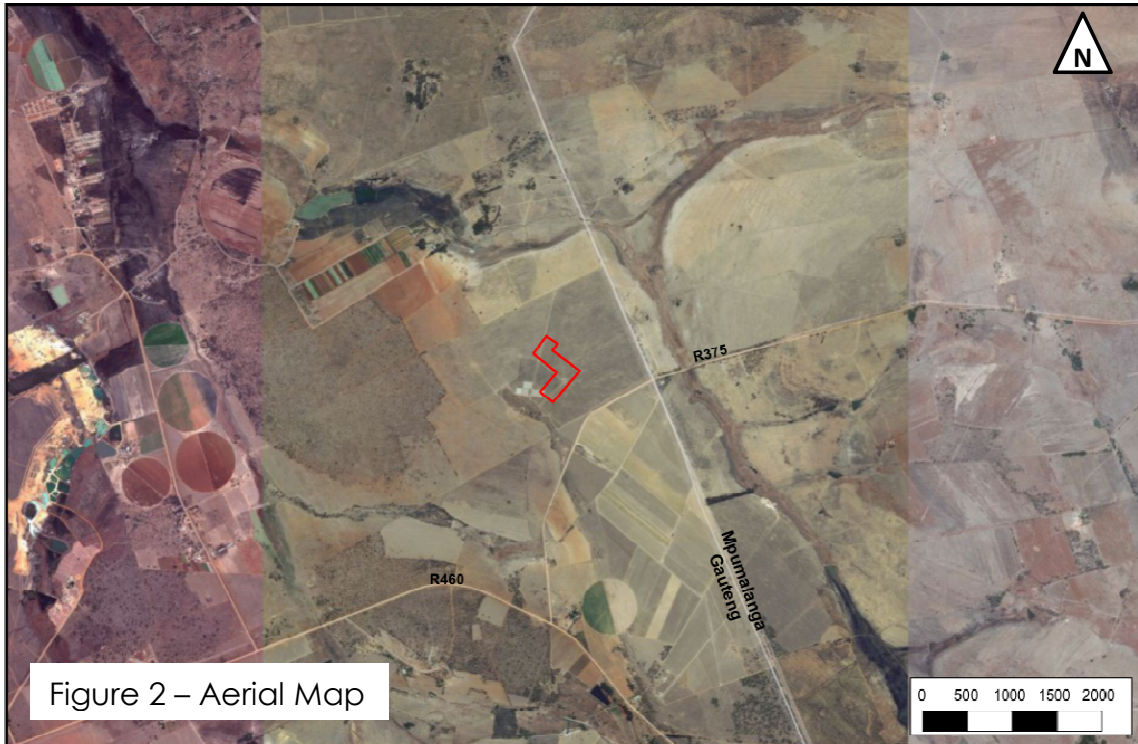
Table 1: Mitigation measures and guidelines for Waste Management

1. Project Outline

Bokamoso Landscape Architects & Environmental Consultants was appointed as independent environmental consultant/ Environmental Assessment Practitioner (EAP) to facilitate the application process for Environmental Authorisation (EA) for the proposed **Cattle Feedlot** in terms of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) (NEMWA) and the 2010 Environmental Impact Assessment (EIA) Regulations.

The proposed cattle feedlot is situated on a Part of Portion 47 of the farm Brandbach 471 JR, Cullinan, Gauteng Province and will measure approximately 19.9 hectares in extent. **(Please refer to Figure 1-Locality Map and Figure 2-Aerial Map)**





The purpose of this WMP is to ensure that all waste material generated at the Cattle Feedlot is correctly sorted, stored, handled and where possible recycled or otherwise disposed of in accordance with legislative requirements, SHEQ policy and objectives and targets. The plan was also compiled to act as guideline document for many years, even if Waste Control Officer and Operational Manager are replaced.

2. WMP Objectives and Context

2.1 Objectives and Principles

The primary objective of this Waste Management Plan (WMP) is to promote the minimization of waste and to ensure that all waste materials generated during the operational phase of the Cattle Feedlot is correctly sorted, stored, handled,

transported, disposed of, monitored and where possible, recycled in accordance with the International, National, Provincial and Local legislative requirements.

The ongoing implementation of the above mentioned WMP will integrate and optimize sustainable waste management and waste recycling principles in order to maximize efficiency and minimize the associated environmental impacts and financial costs of waste and to improve the quality of life of all South Africans.

This WMP has been compiled to promote (amongst others) the following sustainable waste management principles:

- waste prevention;
- cleaner production;
- waste minimization;
- re-use;
- recycling;
- waste treatment; and
- disposal (as a last resort)

It is important that any plan, once implemented, is evaluated and where necessary reviewed to ensure that the respective objectives are being met. Furthermore, it is important to share success stories achieved through additional initiatives and to identify problem areas associated with the existing WMP.

2.2 WMP context

Waste management during the design and construction phases of a development differ significantly from waste management during the operational phase.

Waste management during the construction phase requires temporary measures, it involves less parties, it must aim to set short term goals that will have immediate positive effects and it ends when the construction of a facility is completed. Waste

management and recycling during the operational phase is an ongoing activity that should strive (on a continuous basis) to achieve the short and long term goals and objectives as listed in this management plan. This plan should be regarded as a dynamic plan, which should not only take new and improved technology into consideration, but it should also be updated and amended to eliminate ineffective measures and to incorporate the ever changing legislation, policies, guidelines, by-laws etc. on an international, national, provincial and local level.

3. Legislative Framework

On a National, Provincial and Local Level

The following environmental legislation should be taken into consideration during the planning and execution of waste management activities and processes:

- The Constitution of the Republic of South-Africa, Act No. 108 of 1996 Section 24, 33, Schedule 4 Part 8, Schedule 5: Part B, and Section 156(1);
- The National Environmental Management Act (NEMA), Act No. 107 of 1998 with specific reference to the principles of NEMA;
- Hazardous Substances Act, Act 15 of 1973;
- The National Water Act, Act 36 of 1998 (Sections 19 and 21);
- National Environmental Management: Air quality Act, Act 39 of 2004;
- The National Road Traffic Act, Act No. 93 of 1996;
- The Nuclear Energy Act, Act No. 46 of 1999;
- Schedule 2 of The Atmospheric Pollution Prevention Act , Act No. 44 of 1965 must be regarded as listed activities until the new listed activities in terms of Schedule 21 of the Air Quality Act came into effect;
- The National Environmental Management: Waste Act, Act 59 of 2008;
- The “Draft Waste Classification and Management Regulations”, March 2010; and

- “The Minimum Requirements for Waste Disposal”, Second Edition 1998.

General Background:

It should be noted that on 29 November 2013, the listed activities of the National Environmental Management Waste Act 2008 (Act no 59, 2008) changed as per Government Notice 921 in Government Gazette 37083. Due to this notice some of the activities are no longer triggered. In addition, it is now understood that animal manure is not regarded as waste and therefore the National Environmental Management: Waste Act is not triggered at all and the applicant should only apply for Environmental Authorisation as per the Amended Environmental Impact Assessment Regulations in terms of Chapter 5 of the National Environmental Management Act, 1998 (Act 107 of 1998) (NEMA). Government Notice 278 in Government Gazette 32000 which published National Environmental Management: Waste Act (No 59 of 2008) defined waste as follows:

“waste” means any substance, whether or not that substance can be reduced, re-used, recycled and recovered-

- (a) that is surplus, unwanted, rejected, discarded, abandoned or disposed of;
- (b) which the generator has no further use of for the purposes of production;
- (c) that must be treated or disposed of; or
- (d) that is identified as a waste by the Minister by notice in the Gazette, and includes waste generated by the mining, medical or other sector, but –
 - (i) a by-product is not considered waste; and
 - (ii) any portion of waste, once re-used, recycled and recovered, ceases to be waste.

Government Notice 718 in Government Gazette 32368 which published the List of Waste Management Activities under Section 19(1) of the National Environmental Management: Waste Act (No 59 of 2008) defined animal manure as follows:

“animal manure” means a by-product animal excreta which is bio-degradable in nature and could further be used for fertilization purposes.

Animal manure is defined as a by-product and waste is explicitly defined as not being a by-product and therefore the Waste License application is considered to no longer be required for this proposed project.

4. Waste Classification

In order to formalise the characterisation and separation of waste at source, it is essential that waste generated and managed the Proposed Cattle Feedlot be formally classified according to the provisions of the waste classification system as per National Waste Management Strategy (NWMS). Waste is categorised/classified as either General or Hazardous waste, which in turn can be categorised according to their source into domestic, commercial and industrial (Department of Environmental Affairs and Tourism, 2000).

Hazardous Waste

Hazardous waste is in terms of NEMWA waste which *“owing to its inherent physical, chemical or toxicological characteristics”* has a detrimental impact on human health and the environment. Hazardous waste is subsequently

categorised accordingly in nine different classes which is designated as hazard ratings in terms of the Department of Water Affairs and Forestry (DWAF) Minimum Requirements for the handling, Classification and Disposal of Hazardous Waste (Department of Environmental Affairs and Tourism, 2000).

General Waste

NEMWA refers to general waste as “Waste that does not pose an immediate hazard or threat to health or the environment, and includes (a) domestic waste; (b) building and demolition waste; (c) business waste; (d) inert waste”. General waste can in turn be sub-divided into paper, metals, glass, plastics, organic and inert wastes as per the NWMS.

5. Waste Management Plan

All principles of the Waste Hierarchy Implementation Plan (WHIP) are applicable and needs to be implemented for the Waste Management Plan for the Cattle Feedlot. Measures will be applied to ensure optimal reuse and recycling of materials. The waste generated at Mlekis Cattle Feedlot, animal manure, is classified as General Waste.

5.1 Establishment of a Successful Recycling Programme

The following steps should be followed for the establishment of a successful recycling program:

- Appoint a Waste Control Officer to act as recycling coordinator;
- Identify materials to be collected;
- Identify waste collection points within the waste streams;
- Determine waste sorting methods;
- Determine collection programme logistics;

- Implement and manage waste reduction and recycling plan; and
- Monitor, evaluate and refine the plan.

Table 1. Mitigation measures and guidelines for Waste Management

Mitigation Measures/ Guidelines	Purpose of Guideline/ Mitigation Measure	Time Frame	Responsible Party
GENERAL			
Build a bund around waste storage area to stop overflow into storm water and adjacent wetlands.	Pollution Prevention	Construction Phase	
Confirmation is needed from the local registered landfill site that they do have the capacity to receive the waste generated by the operational phase of the facility.	Pro-Active Planning, Identification of Alternatives	Planning Phase	
Solid waste must be sent through the waste stream to specific waste collection points (waste must be sorted on the site), thereafter the waste must be collected by a registered waste removal and/or recycling company.	Awareness, Waste Reduction, Recycling of Waste	All Phases	
The storage of solid waste on site, until such time that it may be disposed of, must be in a manner acceptable to the Local Authority, The Gauteng Department of Agriculture and Rural development (GDARD) and The National Department of Water Affairs (DWA).	Compliance with Legislation, policies, Frameworks, By-Laws etc.	All Phases	
Place clearly marked separate bins (with lids) on site for paper, metal, glass, plastic and other material on site to ensure sorting of	Recycling, Waste Minimization,	All Phases	

materials to be recycled from an early stage.	Ensuring the Cooperation of Workers at the Site, Ensuring Compliance with Plan		
Keep records of waste reuse, recycling and disposal for future reference.	Monitoring, Data Collection, Recycling, Waste reduction	All Phases	
Prevent unhygienic usage on site and pollution of the natural assets. Develop a central waste temporary holding site to be used during construction (near access entrance). This site should comply with the following: <ul style="list-style-type: none"> ▪ Skips for the containment and disposal of waste that could cause soil and water pollution, i.e. paint, lubricants, etc.; ▪ Small lightweight waste items should be contained in skips with lids to prevent wind littering. 	Pollution Prevention, Ensuring Compliance with Plan	Construction Phase	
During transportation, waste must be covered at all times to prevent wind from blowing away waste causing air pollution and to prevent spillages (especially in the case of collisions and other	Pollution Prevention, Ensuring Compliance with	All Phases	

accidents.	Plan and Legislation		
Waste storage area should be covered to prevent waste washing away or contaminate storm water systems during the rainfall season.	Pollution Prevention	All Phases	
Domestic waste should be contained in skips with lids to prevent wind littering. These skips / bins shall be collected by Municipal workers once a week, and disposed of at a registered, licensed landfill site.	Pollution Prevention, Soil preservation, Waste minimization	All Phases	
No waste water or water containing waste is to be discharged into the existing storm water drainage system.	Pollution Prevention	All Phases	
Implement and manage waste reduction and recycling plan.	To guarantee success of Plan	Operational Phase	
Determine whether waste reduction and recycling targets have been achieved.	To determine success of Plan	Operational Phase	
WASTE MANAGEMENT			
Disposal of solid waste shall be at an appropriately licensed landfill facility.	Pollution Prevention	Operational Phase	
No waste shall be burned on site or at the approved solid waste disposal site.	Pollution Prevention	Operational Phase	
The site should be kept in a neat and tidy condition. All waste items to not be processed by the facility should be temporarily	Pollution Prevention	Operational Phase	

<p>stored in a specific designated area, and regularly disposed of.</p>			
<p>Proper provision should be made for a designated area on site for the duration of the operational phase for the storage of materials such as oils, greases, fuel and any material that might possibly leach into the soil and be harmful to the environment. This area should be lined with some form of secondary containment and bunded to contain at least 110% of the spilled substance.</p>	<p>Pollution Prevention</p>	<p>Operational Phase</p>	
<p><u>Removal and storage of solid waste:</u></p> <ul style="list-style-type: none"> • Most of the manure from cattle lot-fed in paddocks for relatively short periods is incorporated into the soil and the cattle should be periodically rotated between paddocks to ensure the manure loading is not excessive. • Manure from intensive feedlots, where the cattle are confined in high densities or on hard stand for extended periods, should be scraped up and removed as necessary. • The frequency with which pens are cleaned will depend on factors such as the stocking density and the size of the animals. • Manure should be stored in a stockpile on an impervious surface where water from rain, sprinklers or surface drainage 	<p>Pollution Prevention through proper solid waste management</p>	<p>Operational Phase</p>	

<p>cannot access the manure (or where any run-off drains back to holding ponds).</p> <ul style="list-style-type: none"> • Manure can be stored for an extended period until it is used on the farm or is removed off-site for use or disposal in a manner approved by the relevant legislative body. • Low moisture content in the manure will minimise odour and generation of leachate. • Aerobic composting of the manure (in turned piles or rows) may be used to stabilise the waste and reduce the incidence of disease-causing organisms. <p><u>Disposal of solid waste over land:</u></p> <ul style="list-style-type: none"> • The soil where solid feedlot waste is to be spread needs to be suitable for, and able to sustain, the agronomic regimes proposed. The disposal area also needs to be able to accommodate the water, nutrient, salt and organic loads involved. • Land application should be timed to promote most benefit to site vegetation and minimise leaching of nutrients to surface and groundwater. • Manure should be incorporated into the soil where possible. 			
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<p>Otherwise, manure should be spread evenly over the land surface using a manure spreader of suitable design.</p> <ul style="list-style-type: none"> Vegetation cover should be maintained on the disposal area to prevent soil erosion and to enhance nutrient uptake. 			
<p><u>Removal of liquid waste:</u></p> <ul style="list-style-type: none"> Clean stormwater should be channelled away from the feedlot area, using bunds, culverts or drains, to ensure it does not become contaminated with manure or urine. Any contaminated water from areas outside the feedlot, including stormwater run-off, should (wherever possible) be directed via drains to a settling pond lined with very low permeability clay or plastic. This water should then be suitable for discharge to an irrigation area. Surface run-off from the feedlot should be collected in a drainage channel, with a sufficient cross-section. To prevent effluent being washed into a watercourse, all contaminated flows should be directed to stabilisation ponds for treatment before being spread over land by tanker or irrigation. Where liquid and solid waste combine and drain to a pond, effluent treatment is recommended using a multi-pond stabilisation system, incorporating anaerobic and aerobic 	<p>Pollution Prevention through proper liquid waste management</p>	<p>Operational Phase</p>	

<p>treatment.</p> <p><u>Storage of liquid waste in settling ponds:</u></p> <ul style="list-style-type: none"> • Where possible, solids and larger suspended matter should be removed from the effluent stream by the use of coarse screening equipment prior to entering a settling pond. • The capacity of any settling pond should provide adequate retention time for entrained solids to settle out (one and a half to two hours are normally satisfactory). • Adequate free board should be provided to prevent stormwater overflowing from the pond. The outflow from the settling pond should be conveyed either to a holding pond before irrigation over land or to wastewater stabilisation ponds. Captured solids should be applied to land in a sustainable manner using crop nutrient needs and status of soil. The nutrient loading to land is a cumulative loading from all sources, i.e. solid manures, liquids and any artificial fertiliser added. <p><u>Disposal of liquid waste over land:</u></p>			
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<ul style="list-style-type: none"> • In some instances, it may be possible to retain all liquid waste for evaporation in shallow ponds. Liquid waste can be disposed of raw or after treatment (e.g. by ponding). Treatment will reduce the Biological Oxygen Demand (BOD) of the effluent and will allow the waste to be applied over a much smaller area due to reduced odours. The waste disposal area should be located at such a distance that it would not contaminate surface and groundwater resources. • Where wastewater is irrigated over aquifers, monitoring may be required to allow early detection and management of adverse environmental impacts. • Sufficient land disposal area should be available for a 10 to 14-day rest period between applications on any given part of the area, the objective being to alternate between anaerobic and aerobic conditions in the top layer of soil. Shorter periods may be acceptable under dry summer conditions. • Crops or pasture should be maintained to take up as much as possible of the nitrogen and phosphorus from the wastewater to prevent pollution of any ground or surface waters and minimise erosion. 			
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<p>Irrigation systems may include (1) Flood irrigation, (2) Sprinkler irrigation and (3) Trickle irrigation. The latter is generally not suitable for effluent, due to clogging problems.</p>			
<p>Delivery of dead animals to a rendering plant is the preferred disposal method. However, in many areas of the country, a rendering service is not available. Cattle owners should then use burial pits for disposal of dead animals in accordance with local government requirements. They should be sited and constructed as follows:</p> <ul style="list-style-type: none"> • Locate the pit at least 100 metres from boreholes, streams and surface water bodies; • Use areas with clay soil if possible; • Construct the pit so that the bottom is at least 1.5 metres above seasonal high water table; • Pits should be covered with a minimum of one metre of earth after use; and • Distribute pits throughout the property, if more than one pit is required. 	<p>Prevent contamination of soil and groundwater resources</p>	<p>Operational Phase</p>	
<p>The effluent dams should be monitored regularly for leaks and should be repaired accordingly.</p>	<p>Limit water contamination</p>	<p>Operational Phase</p>	

<p>The irrigation of waste water should be done according to the conditions stipulated in the Water Use License. Irrigation activities may only commence once the Water Use License has been granted by the Department of Water Affairs.</p>	<p>Limit water contamination</p>	<p>Operational Phase</p>	
<p>Decontaminate and collect waste in storage area ready for off-site recycling or disposal. Arrange for final collection and removal of excess and waste materials.</p>	<p>Minimise waste</p>	<p>Operational Phase</p>	
<p>RECYCLING</p>			
<p>Wherever possible, materials used or generated during operation shall be recycled or re-used.</p>	<p>Re-Use, Waste Reduction, Recycling</p>	<p>Operational Phase</p>	
<p>NOISE AND AIR POLLUTION</p>			
<p>The applicant shall endeavor to keep noise and vibration generating activities to a minimum. Noisy operational activities that could cause a major disturbance shall only be conducted during daylight working hours (6am – 5pm).</p>	<p>Limit noise pollution</p>	<p>Operational Phase</p>	
<p>All construction vehicles and operational machinery used on site shall be kept in good repair to prevent unnecessary noise.</p>	<p>Limit noise pollution</p>	<p>All Phases</p>	
<p>Waste storage areas for manure should be covered or stored in such a way that it cannot be distributed away from the storage by wind.</p>	<p>Limit air pollution</p>	<p>Operational phase</p>	

HEALTH AND SAFETY			
A Spill Contingency or Emergency Response Plan must be drawn up and should include the actions that need to be in the event of spillages of chemical, fuels etc., during the construction and operational phase of the proposed activity.	Health and Safety compliance, Pollution Prevention	All phases	
A proper Pest Management Plan should be implemented at the facility as the storage of feeding in different areas leads to large populations of rodents and cats that may lead to such quantities that it becomes a pest.	Health and Safety compliance	Operational Phase	

Waste Hierarchy Implementation Plan (WHIP)



Appendix L



Proposed Cattle Feedlot

Draft Waste Hierarchy Implementation Plan

Project Ref No: Gaut 002/12-13/E0222

Date: March 2014

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Document Description:

Document Name:

The proposed cattle feedlot with manure storage and composting facility(s) on part of portion 47 of the farm Brandbach 471 JR, Cullinan.

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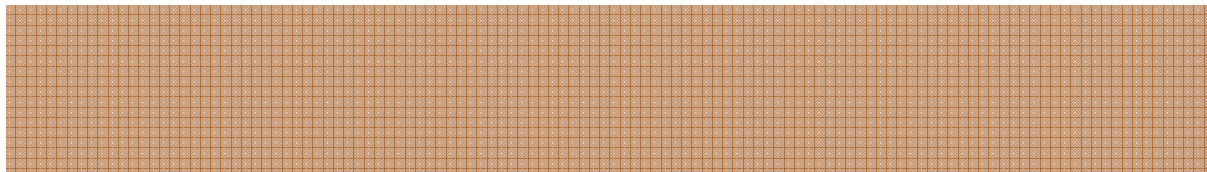


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1. Introduction and Background:

1.1 Introduction:

Bokamoso Landscape Architects & Environmental Consultants have been appointed as an independent environmental consultant/Environmental Assessment Practitioner (EAP) to facilitate the application for Environmental Authorization and a Waste License for the proposed Cattle Feedlot in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA), the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) (here after referred to as NEMWA and/or "The Waste Act"), and the 2010 Environmental Impact Assessment (EIA) Regulations.

The proposed Cattle Feedlot would essentially constitute of the following infrastructure:

- Worker's housing;
- Office;
- Storage areas;
- Hospital;
- Feedlot; and
- Processing unit with a loading bank.

1.2 Background:

Bosman (2009:699) refer to waste as the consequences of all human activity and is generated from a variety of sources including amongst others, agriculture, transportation, the healthcare industry and domestic households. NEMWA, 2008 is regarded as a Specific Environmental Management Act (SEMA) promulgated in terms of NEMA, 1998 and is the flagship environmental management statutes in South Africa which is concerned with and governs the management of all forms and types of waste from generation to disposal. The said Act refer to waste in a South African context as- *any substance whether or not that substance can be reduced, re-used, recycled and recovered:*

- *That is surplus, unwanted, rejected, discarded, abandoned or disposed of;*

- *Which the generator has no further use for the purpose of production;*
- *That must be treated or disposed of;*
- *That is identified as a waste by the minister by notice in the Gazette and includes waste generated by the mining, medical or other sector.*

Countries worldwide generate large quantities of waste, due to rapid population expansions and economic development (United States Environmental Protection Agency, 2002). The said population expansions and the associated quantities of waste generated places immense pressure in natural resources, which in turn result in environmental degradation and pollution on regional and global scales (Bosman, 2009:699). South Africa in particular is faced with the same challenge, with specific reference to the quantities of waste generated by its ever increasing consumerist population, and the inability of the natural environment to absorb and accommodate the said waste (Department of Environmental Affairs, 2011). It is recognised that, sustainable and sound environmental waste management is vital in order to reduce and manage the associated risk which waste and its management pose to human health and the environment, and the depletion of South Africa's non-renewable resources (Gauteng Department of Agriculture, Conservation and Environment, 2006).

The National Waste Management Strategy (here after referred to as the NWMS) was published in 1999, as a long term plan to address issues which emanate from the fragmented waste management system in South Africa, and in turn takes action on the policies which pertain to waste as set out in the White Paper on Integrated Pollution and Waste Management for South Africa (Gauteng Department of Agriculture, Conservation and Environment, 2006). Integrated Waste Management Planning (IWMP) was identified by the NWMS as a strategic objective which is enforced with the enactment of NEMWA, 2008.

Integrated Waste Management Planning (IWMP) can be regarded as a holistic approach of integrating and optimising waste management with the overall objective to maximise efficiency and minimise the environmental impact and pollution, which are associated with the management of the said waste (Department of Environmental Affairs and Tourism, 2000). IWMP furthermore adopts

the interdisciplinary steps of the internationally recognised waste hierarchy. The waste hierarchy is applicable to all types of waste (Bosman, 2009:708), and are considered as a set of waste management actions ranked in a descending order according to their importance **(Please refer to Figure 1- Waste Management Hierarchy)**. The application of the waste management hierarchy is aimed to systematically address and/or facilitate the minimisation of waste disposed to landfill through the actions of waste avoidance, reduction at source, the re-use of waste, recovery, treatment and disposal of waste as last resort. The primary objective if the waste Act, which is to protect the health, well-being and the environment is realized through the application or the recognised waste management hierarchy, and is regarded as the acceptable approach which informs waste management currently in South Africa (Department of Environmental Affairs, 2011).

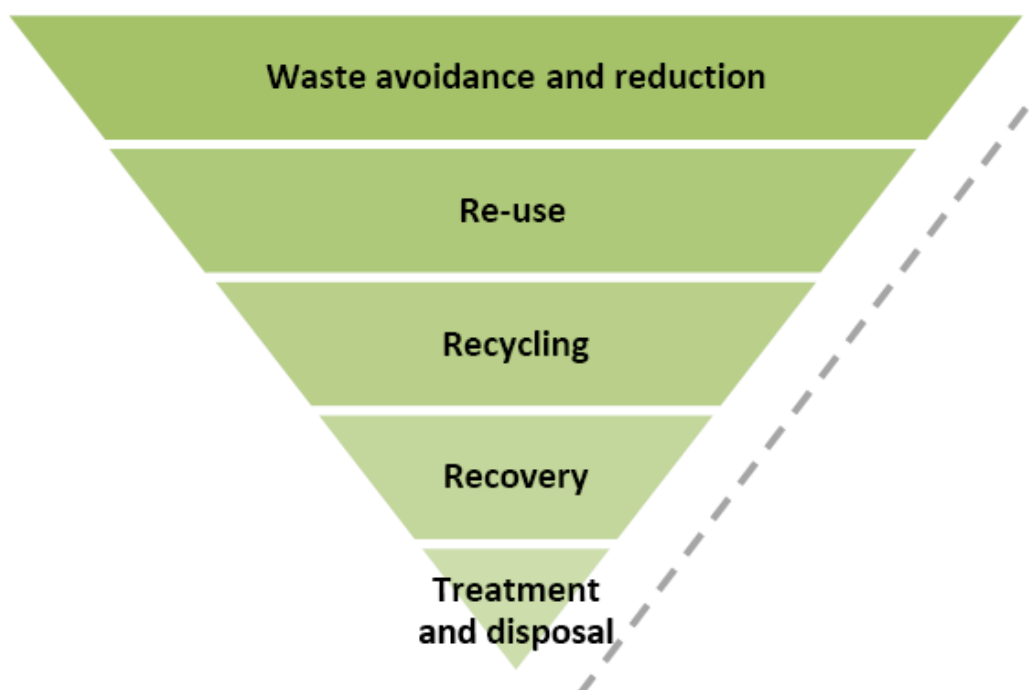


Figure 1: Waste Management Hierarchy (Department of Environmental Affairs, 2011)

The waste hierarchy as per the NWMS requires that waste generation at first resort be prevented, and thus strategies should be implemented to avoid in the first instance waste generated by a facility. In instances where the generation of waste cannot be avoided, a facility should pose to reduce the amount of waste generated, as a second order strategy. Where the generation of waste cannot be reduced, the

waste which emanate from a facility should be re-used, and if not possible be separated from a waste stream to be reclaimed (recycled) for further use. The recovery of waste is as per NEMWA means *“the controlled extraction of a material or the retrieval of energy from waste to produce a product”*. Where waste cannot be recycled, the hierarchy provide for the recovery of waste, mostly for the retrieval of energy from waste to produce a product. All waste which cannot be re-used, recycled and/or recovered, should be treated where possible to change the physical, biological or chemical composition of waste to remove the hazardous and/or toxic components, and thus to minimise the impact of the waste on human health and the environment prior to further use or disposal. Once all possible measures and/or strategies has been taken to appropriately manage waste through the reduction, re-use, recycling, recovery and treatment thereof, disposal to land-fill is considered as the last resort.

This document represents the Waste Hierarchy Implementation Plan (WHIP) and has been compiled to be included in the application for EA for the proposed Cattle Feedlot, for consideration and approval by the competent authority, the Gauteng Department of Agriculture and Rural Development (GDARD). The said plan has been compiled to provide for and give effect to the integrated management of waste as per the waste hierarchy, generated by the proposed Cattle Feedlot. The WHIP is furthermore regarded as a tool, utilised to ensure that the proposed Cattle Feedlot materially complies with NEMWA, more specifically with regard to its general duty of care in respect to waste management as set out in Section 16 of NEMWA, 2008.

2. Purpose, Scope and objectives of the Waste Hierarchy Implementation Plan:

2.1 Purpose of the WHIP:

The WHIP is compiled to give effect to the objectives of IWMP as laid down in NEMWA, 2008. The WHIP should therefore be regarded as a key management tool to ensure the sustainable management of waste during the operational phase of the proposed Cattle Feedlot. The WHIP will thus primarily focus on integrated management measures for waste generated during the operational phase of the

Cattle Feedlot with the primary objective to reduce the amount of waste generated to land-fill and to mitigate the environmental and human risk which are generally associated with the said waste.

2.2 Objectives of the WHIP:

The objectives of the WHIP is to-

- Formalise the identification, categorisation and classification of waste at source;
- Facilitate the minimisation of waste to land-fill, through the application of management practices which pertain to the avoidance, reduction, re-use, recycling or treatment of waste;
- Ensure the appropriate containment and disposal of waste according to acceptable waste management practices; and
- To prevent and/or reduce the environmental and human risks and pollution associated with waste management.

3. Waste Hierarchy Implementation Plan:

3.1 Permitting requirements/Legislative Requirements:

The proposed Cattle Feedlot requires formal approval for listed activities as per Government Notice (GN) 718 of 03 July 2009 as promulgated in NEMWA, 2008. In order to obtain the required authorisation for the waste management activities, an application for a waste license has been lodged at the competent authority, the Gauteng Department of Agriculture and Rural Development (GDARD). This WHIP is compiled in relation to the application for EA. ***(Please refer to Table 1, for the original list of activities applied for in terms of NEMWA)***

Table 1: Original list of activities applied for (prior to the amendments as changed as per Government Notice 921 in Government Gazette 37083 on 29 November 2013).

Indicate the No and date of the relevant notice	Category A or Category B	Activity number as listed in either Category A or B	Describe each listed activity
GN 718 of 3 July 2009	Category A	Activity 1	The storage, including the temporary storage of general waste at a facility that has the capacity to store in excess of 100m ³ of general waste at any one time, excluding the storage of waste in lagoons.
GN 718 of 3 July 2009	Category A	Activity 5	The sorting, shredding, grinding or bailing of general waste at a facility that has the capacity to process in excess of one ton of general waste per day.
GN 718 of 3 July 2009	Category A	Activity 7	The recycling or re-use of general waste of more than 10 tons per month.
GN 718 of 3 July 2009	Category A	Activity 17	The storage, treatment or processing of animal manure at a facility with a capacity to process in excess of one ton per day.
GN 718 of 3 July 2009	Category A	Activity 18	The construction of facilities for activities listed in Category A of this Schedule.

3.2 Waste Characterisation/classification and waste stream identification:

In order to formalise the characterisation and separation of waste at source, it is essential that waste generated and managed by the proposed cattle feedlot be formally classified according to the provisions of the waste classification system as per NWMS. Waste is categorised/classified as either General or Hazardous waste, which in turn can be categorised according to their source into domestic,

commercial and industrial (Department of Environmental Affairs and Tourism, 2000). NEMWA refers to waste as *“any substance, whether or not that substance can be reduced, reused, recycled and recovered –*

- *that is surplus, unwanted, rejected, discarded, abandoned or disposed of;*
- *which the generator has no further use of for the purposes of production;*
- *that must be treated or disposed of; or*
- *that is identified as a waste by the Minister by notice in the Gazette, and includes waste generated by the mining, medical or other sector; but –*
 - *a by-product is not considered waste; and*
 - *any portion of waste, once re-used, recycled and recovered, ceases to be waste”*

Where *“by-product” means a substance that is produced as part of a process that is primarily intended to produce another substance or product and that has the characteristics of an equivalent virgin product or material”*

Other key definitions in NEMWA are:

- **Hazardous Waste:** Any waste that contains organic or inorganic elements or compounds that may, owing to the inherent physical, chemical or toxicological characteristics of that waste, have a detrimental impact on health and the environment.
- **General Waste:** Waste that does not pose an immediate hazard or threat to health or to the environment, and includes (a) domestic waste; (b) building and demolition waste; (c) business waste and (d) inert waste.
- **Inert Waste:** Waste that (a) does not undergo any significant physical, chemical or biological transformation after disposal, (b) does not burn, react physically or chemically biodegrade or otherwise adversely affect any other matter or environment with which it may come into contact; and (c) does not impact negatively on the environment, because of its pollutant content and because the toxicity of its leachate is insignificant.

The manure generated by the proposed Cattle Feedlot is classified as general waste. Approximately 20 ton manure will be produced daily. Manure may be temporarily stockpiled within the pens after which the dry manure are removed and stored in a manure stockpile situated to the north of the feedlot. The manure in the

stockpiles is being applied to land as fertilizer and will also be used in a composting facility in future where the compost will be sold. **Refer to Figure 2 for a layout of the proposed cattle feedlot**

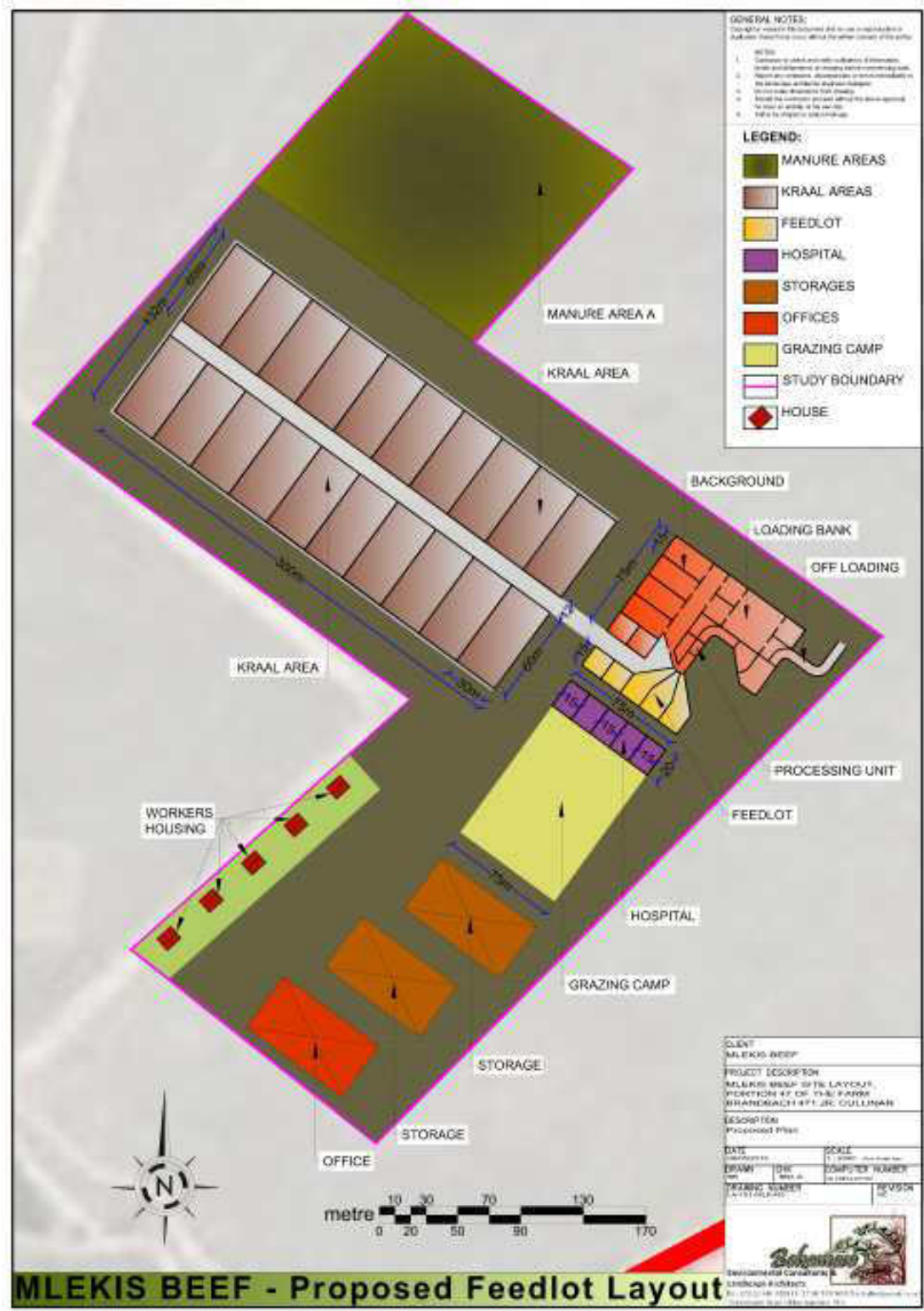


Figure 2: Layout of the proposed cattle feedlot

3.3 Waste avoidance and reduction

The waste hierarchy plan promotes the avoidance and reduction of waste. The proposed cattle feedlot will support this initiative. It is important to note that the production of manure at any cattle feedlot cannot be avoided but can be reduced by reducing the amount of cattle. Where waste cannot be avoided, the waste hierarchy's next step indicates that the waste should be reused, recycled, recovered and treated or disposed.

3.4 Re-Use

Reuse is defined in the Waste Act as follows: *"Reuse means to utilize articles from the waste stream again for similar or different purpose without changing the form or properties of the articles"*

Manure will be re-used at the proposed cattle feedlot by applying it as fertiliser on agricultural lands.

3.5 Recycling

Recycling is defined in the Waste Act as follows: *"Recycling means a process where waste is reclaimed for further use, which process involves the separation of waste from a waste stream for further use and the processing of that separated material as a product of raw material"*

The manure stockpile areas at the proposed cattle feedlot will be the area where the manure will decompose and be recycled to produce the compost that will be sold.

3.6 Recovery

Recovery is defined in the Waste Act as follows: *"Recovery means the controlled extraction of material or the retrieval of energy from waste to produce a product"*

Manure is recovered from the pens, at the proposed cattle feedlot, and stockpiled at the manure storage areas.

3.7 Treatment and Disposal

The term “treatment” is defined in the Waste Act as:

Any method, technique or process that is designed to –

- a) Change the physical, biological or chemical character or composition of a waste; or*
- b) Remove, separate, concentrate or recover a hazardous or toxic component of a waste; or*
- c) Destroy or reduce the toxicity of a waste*

In order to minimize the impact of the waste on the environment prior to further use or disposal.

In terms of section (a) of this definition the proposed composting facility could be considered as a treatment as it will change the composition of the manure.

The term “disposal” is defined in the Waste Act as:

The burial, deposit, discharge, abandoning, dumping, placing or release of any waste into, or onto, any land.

The application of manure, from the proposed cattle feedlot, to agricultural land as fertilizer can be regarded as disposal of waste to land.

4. Conclusion

Waste management at the proposed Cattle Feedlot takes place in accordance to the waste hierarchy by means of the reuse, recovery, recycling and treatment of manure in the proposed composting facility and disposal of manure as fertilizer.